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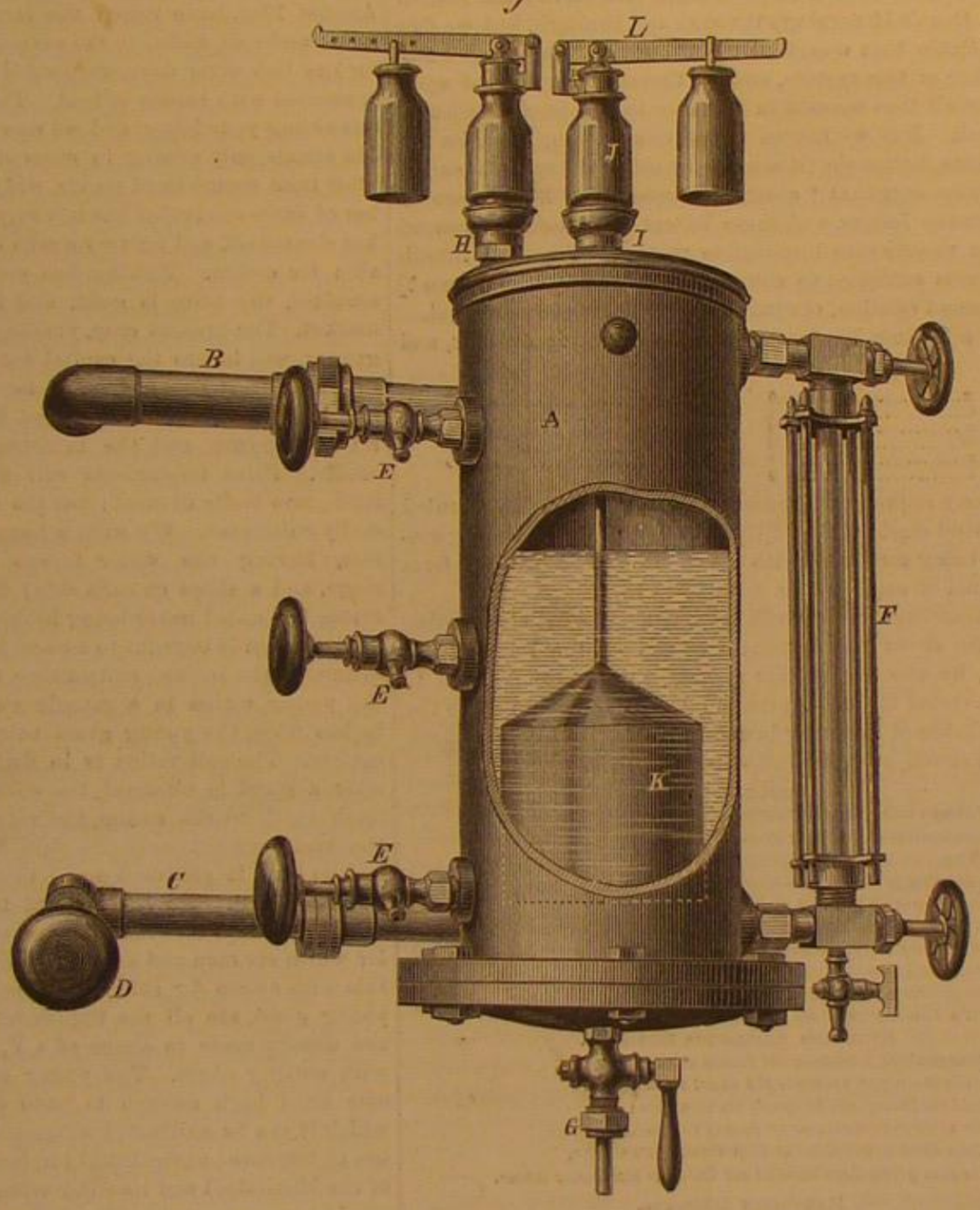
Improvement in Steam and Water Indicators.

Difficulties attend the use of safety valves, water indicators, try cocks, and alarms, as applied to steam boilers, owing to corrosion, clogging by sediment, and other causes not always readily detected. Every engineer knows that, ordinarily, eternal vigilance is the price of his safety and of those whose lives are under his care. Frequently this vigilance must be exercised by attention to several devices, not arranged together, although intended to operate in concert. The engravings present views of a patented indicator and alarm, which, we are satisfied from a close examination of the device and its working in actual practice, is well calculated to show the condition of the water and steam in all cases, and and may be made to give an alarm for either low water or high steam, or any inconvenient or dangerous condition of the contents of the boiler. The testimony of Messrs. Pratt, Whitney & Co., the well-known tool builders of Hartford, Conn., who have used one on their boiler for six months, and have just ordered another for a new boiler, is of the most favorable character, and ought to satisfy all who know the standing of that firm.

Fig. 1



BERRYMAN'S STEAM AND WATER INDICATOR AND ALARM.

An upright cylinder, A, is attached to the head of the boiler by pipes, B and C; one of which, B, enters the boiler in the steam space, and the other below the water line. The lower pipe, C, has a cock, D, to prevent the accumulation of mud or sediment in the elbow. The cylinder, A, thus becomes a part of the boiler, and has the ordinary water and steam gage cocks, E, attached, and also the common glass indicator, F, for water, on the front. The use of the blow-off cock, G, at the bottom of the cylinder, will need no explanation to engineers.

Two valves are arranged in the upper part of the cylinder, one of which, H, opening upward, is raised by the excessive pressure of steam, and acts as a safety valve, while the other, I, opening downward, is lowered by a weight when either the pressure of the steam, or the level of the water falls below a given or determinate point. This valve, as well as the other, may have attached, as seen in the engravings, whistles, J, intended to sound an alarm. If not wanted, these whistles may be dispensed with. The steam safety valve, H, is governed in its pressure, as ordinary valves, by a lever and an adjustable weight, the fulcrum, however, that receives the end of the lever being seated on the guide of the valve spindle, so that it may be turned to any position, and the play of the valve is governed by the screw thread on the hollow guide. The stem of the valve, I, extends down through the center of the cylinder, and receives on its lower end a weight, K, either of hollow metal or disks of soapstone, or other suitable material. This valve opens downward, and like the other, its lever and fulcrum may be moved into any position most convenient.

The weight, K, is adjusted to the pressure of steam required and the hight of water. When the water is at the low water line, the weight, K, will open the valve and sound the alarm. As the water rises, the weight diminishes (being supported by the water), and closes the valve. If the pressure of steam is reduced, its force on the valve is correspondingly reduced, and an alarm is given, by the dropping of the valve, for low steam. It will alarm for high water on the same principle, as too much water in the boiler diminishes the steam pressure, and prevents the rapid generation of steam. The reliability of the indicator can be tested by pressing on the lever, L. The cone-like form of the weight, K, combined with the blow cock, G, insures perfect cleanliness in the cylinder, as all sediment must settle, and can be blown off through the cock. The steam pipe, B, is larger than the water pipe, C, which prevents the water from rising when the indicator alarms for low steam or high water. There are no springs, levers, or movable joints in the cylinder or chamber to become corroded, and no valves between the chamber and boiler; thus the chamber becomes virtually a portion of the boiler, and under no circumstances of lowness of water or foulness of boiler, can the indicator fail to represent the actual hight of water and condition of steam.

Patented through the Scientific American Patent Agency, July 28, 1868, by Robert Berryman, who may be addressed at No. 219 North Third st., Philadelphia, Pa., for the instrument, and for State or manufacturing rights; where, also, the indicator may be seen in operation.

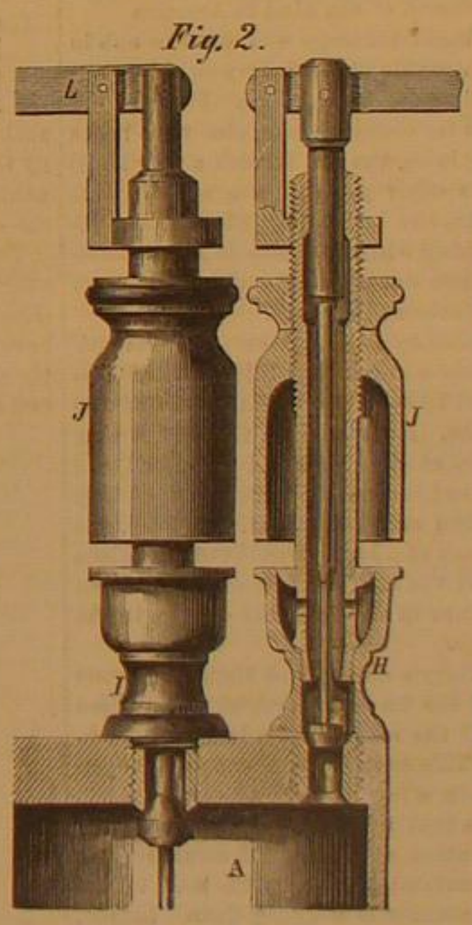
Concentrated Progress of the World.

Few phenomena are more remarkable, yet few have been less remarked, than the degree in which material civilization—the progress of mankind in all those contrivances which oil the wheels and promote the comfort of daily life—has been concentrated in the last half century. It is not too much to say that in these respects more has been done, richer and more prolific discoveries have been made, grander achievements have been realised, in the course of the fifty years of our own lifetime than in all the previous lifetime of the race, since states, nations, and politics such as history makes us acquainted with, have had their being. It is in the three momentous matters of light, locomotion, and communication that the progress effected in this generation contrasts most surprisingly with the aggregate of the progress effected in all generations put together since the earliest dawn of authentic history. The lamps and torches which illuminated Belshazzar's feast were probably just as brilliant, and framed out of nearly the same materials, as those which shone upon the splendid fêtes of Versailles when Maria Antoinette presided over them, or those of the Tuileries during the Imperial magnificence of the First Napoleon. Pine wood, oil, and perhaps wax, lighted the banquet halls of the wealthiest nobles, alike in the eighteenth century before Christ and in the eighteenth century after Christ. There was little difference, except in finish of workmanship and elegance of design—little, if any advance, we mean, in the illuminating power, or in the source whence that power was drawn—between the lamps used in the days of the Pyramids, the days of the Coliseum, and the days of Kensington Palace. Fifty years ago, that is, we burnt the same articles, and got about the same amount of light from them, as we did five thousand years ago. Now, we use gas of which each burner is equal to fifteen or twenty candles; and when we wish for more can have recourse to the electric light or analogous inventions, which are fifty-fold more brilliant and far-reaching than even the best gas.

The streets of cities, which from the days of Pharaoh to those of Voltaire were dim and gloomy, even where not wholly unlighted, now blaze everywhere (except in London with something of the brilliancy of moonlight. In a word, all the advance that has been made in these respects has been made since many of us were children. We remember light as it was in the days of Solomon; we see it as Drummond and Faraday have made it.

The same thing may be said of locomotion. Nimrod and Noah traveled just in the same way, and just at the same rate, as Thomas Assheton Smith and Mr. Coke of Norfolk. The chariots of the Olympic Games went just as fast as the chariots that conveyed our nobles to the Derby, "in our hot youth, when George the Third was King." When Abraham wanted to send a message to Lot he despatched a man on horseback, who galloped twelve miles an hour. When our fathers wanted to send a message to their nephews, they could do no better and go no quicker. When we were young, if we wished to travel from London to Edinburgh, we thought ourselves lucky if we could average eight miles an hour—just as Robert Bruce might have done. Now, in our old age, we feel ourselves aggrieved if we do not average forty miles.

Fig. 2.



Everything that has been done in this line since the world began—everything, perhaps, that the capacities of matter and the conditions of the human frame will ever allow to be done—has been done since we were boys. The same at sea. Probably, when the wind was favorable, Ulysses, who was a bold and skillful navigator, sailed as fast as a Dutch merchantman of the year 1800, nearly as fast at times as an American yacht or clipper of our fathers' day. Now, we steam twelve and fifteen miles an hour with wonderful regularity, whether wind and tide be favorable or not; nor is it likely that we shall ever be able to go much faster. But the progress in the means of communication is the most remarkable of all. In this respect Mr. Pitt was no better off than Pericles or Agamemnon. If Ruth had wished to write to Naomi, or David to send a word of love to Jonathan when he was a hundred miles away, they could not possibly have done it under twelve hours. Nor could we to our friends 30 years ago. In 1868 the humblest citizen of Great Britain can send such a message, not a hundred miles, but a thousand, in twelve minutes.—*Spectator.*

Death of the German Chemist Schonbein.

The telegraph announces the death of another eminent philosopher, whose labors have conduced greatly to the progress of science during the last half century. Christian Friedrick Schonbein was born in Würtemburg, Oct. 18, 1799. At the age of twenty-five he was a professor of chemistry at Reihau. After visiting and spending considerable time in France and England, for the purpose of completing his scientific education, he commenced a brilliant career in the university of Basel. His first experiments in this celebrated institution, led to important voltaic and electro-chemical investigations, which resulted in the demonstration of important principles. In 1839, his attention was attracted to certain peculiarities in the chemical action of oxygen, and its existence in the allotropic condition to which the name of ozone has been given, was made by him the same year. In 1845 he invented gun-cotton. The later portions of his life have been devoted to experiments with oxygen, and the production of numerous works upon abstruse physical and scientific subjects.

PRACTICAL HOROLOGY IN AMERICA.

The American watchmaker, so-called, is not usually a manufacturer of watches, or even parts of watches, but simply an artist whose business it is to repair and keep watches in order. He is generally a man of rare mechanical genius, capable of turning his hand to almost anything, hence he is not unfrequently, especially in the country, also a clockmaker—in the same sense—a jeweler, and a repairer of musical instruments. In short, the good watchmaker is almost invariably, if he is disposed to let himself out, a Jack-of-all-trades. He must possess a degree of ingenuity sufficient to qualify him for almost any mechanical performance without the benefit of a previous apprenticeship, or he cannot be a successful watchmaker, for it is a business in which there is no regular routine, as in other trades. Any industrious person, though endowed with nothing above an ordinary capacity, may, in obedience to a long series of instructions, combined with practice, make a master carpenter, blacksmith or wheelwright of himself, but not a watchmaker. The watchmaker, whose skill is to render him deserving of the appellation, must be blessed with a natural gift above the generality. Like the painter, the sculptor or the poet, he must be born to the calling. Not only must he be what is termed a natural mechanic, but a philosopher as well, possessed of a good reasoning power of his own; for instances are sure to occur, and often, in which he will be called upon to ferret out causes and effects never met with or thought of by his instructions.

I throw in these hints, not with a view to the discouragement of any, but in the hope that they may be of benefit to some who are thinking of becoming watchmakers. If the true element is in them, it has given evidence of the fact, and they may go ahead with confidence of success; if not, they had better abandon the idea at once and turn attention to something else; bearing in mind that all were not made for the same vocation, and that he who would not make a useful watchmaker, might more than succeed at some other calling. True, a person might get along at the business without these extra qualifications named, but there would be no chances for him to excel, and unless one could be an excellent watchmaker, he had far better be no watchmaker at all. Unfortunately for us and for them, there are already too many second and third class workmen of the kind in America.

To within a few years back, horology was at a low ebb in the United States. It is beginning to look up now, however, with excellent prospects for a glorious future. I am of the opinion that the day is not far distant when she will make not only all her own time-pieces, but will furnish a very large proportion of those used in other parts of the world. This conclusion I base upon what she has done and is doing already. It is truly astonishing when we take into consideration the fact that the business was a stranger to her shores up to the beginning of the nineteenth century.

The first attempt at producing machines on American soil for the measurement of time was made by Eli Terry, of Plymouth Hollow, Conn., A. D. 1800, in the manufacture of the old-fashioned wooden clocks. He went into the business on an exceedingly small scale at first, doing, I think, all the work himself, and acting as his own salesman and traveling agent. He would finish two or three clocks, it is said, and swinging them upon the back of a horse, would strike out into the country and peddle till the last one was sold; then, but not till then, he would return to his home and engage in the manufacture of a new cargo.

The excellence of Mr. Terry's clocks, and their cheapness when compared to that of the imported article, soon caused his business to grow until the erection of a large establishment became necessary. This continued in successful operation until Mr. Terry's death, a few years ago.

When it became known that the Plymouth Hollow clock factory was a paying institution, other establishments sprung up to rival it. Great improvements were made both in the materials worked and the manner of working them. Indeed, so rapid was the progress made that only a few brief years passed ere America was famed abroad for producing the best clocks in the world, and large exportations were constantly being made.

An establishment for the manufacture of watches went into operation at Worcester, Mass., in 1812, but soon failed. In 1830, another was started at Hartford, Conn., but after turning out near one thousand watches, it too went down, and the hope of competing successfully with English work seemed to die out for the present.

In 1850, Mr. A. L. Dennison, of Maine, suggested the idea of manufacturing a watch entire in one establishment, by properly constructed machinery—a thing not yet thought of in Europe. Others took with the idea and soon joined him in the erection of a manufactory at Roxbury, Mass.

The plan worked to the satisfaction of all concerned, but the site was found to be unsuitable on account of the dust; consequently, in 1854, the concern was removed to Waltham, in the same State, where it is still (1868) in successful operation, turning out the celebrated "American Watches" in large numbers. It is known as "The American Watch Company of Waltham, Mass.," and its watches have acquired a good reputation.

A second watch manufactory on Mr. Dennison's plan, was established at Nashua, New Hampshire; but want of capital soon caused it to fail, and the American Watch Company bought its machinery. A third is now in operation at Elgin, Illinois, near Chicago, under style of "The National Watch Company." It was established in 1867, and its productions have a very excellent reputation.—*Watchmaker and Jeweler.*

THE sugar refineries of Philadelphia annually refine 190,000,000 lbs. of raw sugar per annum, worth at present prices $22,000,000.

AIDE MEMOIRE FOR SILICIOUS FORMULAE.

The above is the title of a paper contributed to the *Chemical News*, by the Rev. B. W. Gibsone, M. A. It is an application of mnemonics to the instruction of pupils in mineralogy and shows such an amount of originality that, notwithstanding the technical nature of the subject, it will be read with interest by those who know nothing of mineralogy, as well as by those who are experts. The latter, by its perusal, will be enabled to see how much unnecessary labor they have undergone, while the former, now that all the difficulties of the subject are removed, may be expected to immediately become intensely interested in the science.

Mr. Gibsone adopts as the basis of this beautiful system, the formula

$$p\mathrm{MO},q\mathrm{SiO_2} + r\mathrm{R_2O_3},s\mathrm{SiO_2} + t\mathrm{H_2O}.$$

in which the italics represent the numbers which indicate the proportions in which the substances represented by the Roman letters are found combined in the different silicious minerals. The substitution of the values of the italics, in the formulae expressing the composition of these substances, has been such a severe strain upon the minds of the author's pupils that he has been led to lighten their labors by the following ingenious method, which has given them (or him) such extreme satisfaction, that he has bestowed it upon the public through the pages of the *Chemical News*. As a true citizen of the United States, we feel sorely vexed that this discovery should have been made in England, and we call our school teachers to task for their stupidity. We have looked the late edition of Prof. Dana's Mineralogy through and through, but we find not a syllable that would lead us to suppose that he had any knowledge of this system, and we therefore feel called upon to retract all that we said in its favor in our recent notice of that work. But we hasten to lay this system, in all its fair proportions, before the (it must be by this time) curious eader. Mr. Gibsone says that "abstract numbers may be represented by consonant letters, and these letters may then be grouped by aid of vowels into intelligible words [Query. Are intelligible words sufficient to constitute an intelligible system?] having some relation, obvious or fanciful, to their original.

Thus adopting Howlett's system of *memoria technica*, and calling

s or x	0	d or v	6
q or t	1	c or k	7
h or n	2	b or w	8
g or m	3	p or f	9
r or z	4	y	10
j or l	5		

such a long sequence of figures as 59221 might be represented by the word *elephant*, or 92(10)75 by *physical*, the semi-consonant, y, being combined with the following consonant to form the symbol of any number from 10 to 19.

The following extracts will serve to show what elephantine efforts are saved the fortunate pupils of the Rev. B. W. Gibsone, by the use of this system, which may be said to have converted the usual mental labor of acquisition into the physical labor of shouting in concert, with head thrown back and eyes closed, such exercises as

ALUMINOUS SILICATES.

German calls Garnet idocrase;
Man makes Staurolite; *grain* of clay's
(*O tædium dil!*) débris Felspar;
Rare gaze to duped eyes Micas are;
Heat Topaz and its tint will *fade;*
Of *murder* Scapolite 's afraid
And gLucy Beryl sweet *good maid,*
Trapezal Leucite brings *them aid,*
But *graver* Epidote can't come;
Pol'd Tourmaline is *set in gum.*

HYDRATED ALUMINOUS SILICATES.

Tune maiden Analcime thy feeble lyre.
While Mesorype searches *the mart* for a buyer.
Quid mi Dave! see Stilbite's lustrous fire;
The zeolyte Prehnite *ne'er meant* to proclaim
Them dead to the fame of frail Chabazie's shame,
Nor that green-slate became for Chlorite *our home name.*

MAGNESIAN SILICATES.

Hail Talc, and in Magnesian group
Gib Steatite a part,
Never smoke Meerschaum, or the croup
Will *hurt* Picrosmine's *heart.*

Proud Augite, Pyroxene, Hypersthene *queen*
Has three t.tles, but Chrysolite Olivine *none,*
Substitutive ferruginous Serpentine *green,*
And tough Amphibole, Hornblende will finish *lay one.*

Splendid exercises for public examinations, and so indicative of superior knowledge upon the part of any one who could by any means remember or interpret their meaning, that we suggest the appointment of a committee of the most eminent educators in the United States to wait on Mr. Gibsone with a request that he should visit America as soon as possible, to give a series of popular lectures, upon the now simplified science of mineralogy, to be interspersed with personal recitations of other specimens of humorous and instructive scientific poetry of which he doubtless has plenty in reserve. Or, if he prefers to sing them, they would be all the more attractive. Peradventure some composer might be found who could set the stanzas to appropriate music.

The Telegraph in Philadelphia.

The Western Union Telegraph Company, at the southeast corner of Third and Chestnut streets, is one of the great institutions in the way of transmitting and receiving information to nearly every town and city in the United States, to Canada, England, Egypt, and even China. To accommodate this vast business, 123 wires enter the building, and are connected with two batteries; one of 65 cups, with a positive pole, which furnishes battery power to 28 different wires; the other with 45 cups and a negative pole, furnishes power to 11 different wires. Of the 123 wires, 49 are known as through wires, sending messages direct to certain given points. Twelve are for way stations; 26 are loop wires for use in connection with branch offices; 11 wires for city office, and 25 to be kept for contingencies. These lines connect with 49 instruments in the fifth story (all messages received by these are given to the operator by sound instead of on paper, as originally invented) and three are connected with printing machines located on the first floor.

The wires lead out of the office as follows: 24 to New York; 15 to Washington; 10 to Pittsburg; 1 to Cape May; 1 to Salem, N. J.; 2 to Scranton, by way of Trenton and Easton; 1 to Atlantic City; 1 to Long Branch, and 1 to Williamsport.

The force required to carry on the business of the office is thus summed up; 39 operators of Morse instruments, 3 of the printing; 16 clerks; 8 office boys; 30 messengers; 1 janitor; 3 for turning printing machine; 1 battery keeper; 3 repairers; 6 branch office clerks; 34 clerks on city line; 1 manager; 1 office clerk; 1 night clerk: 1 cashier; also on city line, 37 operators; 2 clerks; 1 superintendent, and 21 messengers.

The wires of the Philadelphia office have recently been very skillfully arranged by Mr. M. V. B. Buell, Assistant Superintendent. Few men in the service know better how to do it.—*Journal of the Telegraph.*

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Cotton Planting—New Implements Wanted.

MESSRS. EDITORS:—The continuous rains from July 1st, to August 10th, have risked the larger portion of the cotton crop; and this, added to the extreme scarcity of money, has, for the last sixty days, suspended all business except that connected with supply of food. This has caused us to delay answering your letter, and we now find that the demand for gin stands, only arising in cases of necessity, has been supplied from second-hand stands, which the diminution in number of acres cultivated has left very abundant. The weather has cleared off, and for two weeks has been extremely favorable for cotton. Picking has commenced under favorable auspices, the price is good, and it is rapidly coming into market. The present crop, yielding very large profits to the grower, will insure the capital for next year, and the cultivation of every acre of ground for which labor can be procured. This will cause a demand for labor-saving agricultural implements, and the introduction of them will yield profits. These implements will first be used on our level lands, now badly drained; but the soil is so pliable as to be easily cultivated. We want a buggy plow, cultivating seven feet, having the water furrow eight inches below the ridge, and a ridge on each side; the ridges upon which the cotton is planted never being broken.

The cotton is brought to a stand in early spring by a sweep skimming the surface, and cutting the tender grass, leaving the young cotton in a margin on top of the ridges three inches wide, the young grass being cut off just below the surface. The cultivation is in drills, never in squares; and after a stand is obtained, the entire culture is by throwing fresh earth to the cotton, the ridges never being broken; the main sustenance to the plant being from the tap root, and no fruit is produced until this root reaches the hard or unbroken soil. An agricultural implement, with seat for driver, would enable one man and two mules to do the work for which six men and as many mules are now required, and this with sweep for skimming the surface, and cutting the young grass, are all the implements required. The sweeps are usually made in shape of a V, the angle in front, and with cutting edges. The young cotton plant is very delicate until high enough to have dirt thrown upon it, after which it can be cultivated altogether by mule power. The use of improved agricultural implements, on the level lands of the Mississippi and its tributaries, by negro men and boys, would add enormously to its production; the gathering being done at so much per pound, the women and children then assisting, and all receiving cash for their labor.

Vicksburg, Miss. A. M. PAXTON & Co.

The Philosophy of the Velocipede.

MESSRS. EDITORS:—The velocipede is attracting considerable attention in the East, not only from the surprising feats which it is made to perform, but also the ease and rapidity with which the operator is enabled to traverse short distances, compared with the time and labor necessary to travel the same by walking.

That a carriage or velocipede, with but two wheels, the one following the track of the other, and propelled by the feet of the rider (by simple crank motions), should maintain an upright position is, to the superficial observer, one of the most surprising feats of practical mechanics.

When, however, we consider the law of moving bodies, and their tendency to continue in the direction of the impulse that set them in motion, and apply it to the velocipede, we have the philosophy of the whole problem. The case of the operator to maintain his equilibrium while the machine is in motion, or rather the tendency of the velocipede to be self-sustaining, after a certain velocity is attained, is the same as that which sustains, against the law of gravity, the spinning top, the revolving wheel, and the rolling hoop. In experimenting upon this subject, we observe that a wheel of given dimensions will maintain its equilibrium while revolving down a slightly inclined plane, with no greater velocity than from five to six miles per hour; and when its motion becomes sufficiently retarded to incline to either side, that the wheel does not immediately drop, as in the instance of one set upright and not in motion; but as it is more retarded, it describes a spiral curve of decreasing form, and, finally, comes to the ground.

Now, from the very nature of this curve being in the di-

rection, or on the side of the falling wheel, it has a tendency to raise the wheel to an upright position; and were its motion, while in the act of falling, a uniform and not a retarding one, it is evident that, like the velocipede, it would regain its balance, and with no interfering obstacle, would again move off in a direct line.

The rule that governs the motions of the simple wheel is applicable to the more complex velocipede, with this difference, that, in the latter, the propelling force is continuously applied, and for this cause, that the rider could upset his vehicle while moving in a straight line, and with a certain velocity, is impracticable.

Hence, as we understand the philosophy of the velocipede, and its mechanical simplicity, we infer the practical utility of the same, and wonder why it was not brought into use sooner. H. O.

Center of Gravity of a Revolving Wheel.

MESSRS. EDITORS:—The assertion that in a vertical revolving wheel the center of gravity shifts when in motion is not new. It was suggested here some ten years ago, at the time that many inquiring minds tried to explain the action of the rotascope or gyroscope, when this little old apparatus became, in a new shape, generally known to the public. Some asserted that the weight of a wheel diminished when revolving, others that its center of gravity was moved upward, or that it was moved forward from the axis; every assertion being a ground less hypothesis by which the explanation of the rotascope was supposed to be made easy. At that time, I demonstrated by actual experiment, before the Mechanics' Institute, of New York (now, alas, defunct), the falsity of each of these assertions. The last one (the one in question, page 178) was disproved by attaching to each extremity of a balance beam an easily movable vertical wheel, rotating in the same plane as the beam, when, by putting this wheel in motion, the center of gravity had been shifted from the axis of the balance or towards it, it was supposed that the equilibrium established beforehand would be destroyed. This, however, was never the case; when there was equilibrium before the rotation, it remained so during the rotation of the wheel or wheels in any direction.

I know some arguments may be opposed against this form of the experiment, which it would be unprofitable to discuss here. The only point I wish to prove is the antiquity of the hypothesis of which you have so well explained the absurdity, on page 179. P. H. VAN DER WEYDE, M. D.

New York city.

White Opaque Glue.

MESSRS. EDITORS:—Mr. Jones states, in regard to mixing Paris white with glue, that he saw by the microscope the white enclosed in separate cells formed by the glue, and that he could see each grain. From this it is evident, first, that he did not mix the white thoroughly, second, that he used too much white altogether, and, third, that his white was not pure enough, as real Paris white will not show "grains" under the microscope. I will add for his information that the best white Cooper glue, rightly so celebrated for its superior sticking qualities, is all made white and opaque by an admixture of Paris white, but of so fine a quality and so well incorporated that no microscope will show any grain or any cell or sac separating the glue.

In conclusion, I will say that many practical men assert that the sticking qualities of glue *are* really improved by a limited quantity of very fine Paris white well incorporated; but whatever may be the case, the valuable information I did give on this subject, page 83, was brought out by the blundering of some correspondents; one of whom recommended, for whitening the glue, gritty bone ashes, the other recommended chemicals which destroy the glue entirely. I therefore analyzed a sample of white opaque glue of excellent sticking quality, examined it with the microscope, etc., and gave the result gratuitously to the readers of the SCIENTIFIC AMERICAN, many of whom appeared anxious to know how white opaque glue was produced.

P. H. VAN DER WEYDE, M. D.

New York city.

Unreliability of the Glass Gage for Steam Boilers.

MESSRS. EDITORS:—Being a reader of your valuable paper, I observed an invitation to the hard-fisted sons of toil to be more communicative, and that their compliance would be pleasing. As this is so, I wish to say a few words on water gages for steam boilers, particularly those having a glass indicator set in front of the boiler with a steam communication at the top and a water communication at the bottom of the chamber. I think they are not to be implicitly trusted.

A short time ago the engine and boiler which I run, were inspected and tested by an expert employed by the insurance companies, and he stated that there was no scale for sediment in the boiler; yet two days after the glass indicator showed water to the hight of three gages, when, on trying the cocks, the second one barely gave indications of water, and it was only by letting it remain open and permitting the steam to escape that I could draw water. The communication at the top of the glass had become partially clogged. I believe that no matter how low the lower gage cock is placed, if the steam connection with the indicator is partially closed or clogged the pressure of the steam will raise the water in the indicator tube above the level of that in the boiler.

Sheboygan, Wis. J. S.

[The laws of hydrostatics show that a small column of a fluid will balance a large column. The level of water shown in the glass indicator tube is that of the level in the boiler if the proper communication is maintained between the tube and boiler. Our correspondent's experience does not prove the unreliability of glass indicators, but shows the necessity of care in keeping them clean and the passages open.—EDS.

A Word for the Old Fashioned Trip Hammer.

MESSRS. EDITORS:—Having been for many years a constant reader of your valuable paper, which is always open to both sides of the question, I wish to speak in behalf of the old fashioned trip hammer. On page 161, current volume, you speak slightingly of the trip hammer, that is, of the old style with its wooden handle or helve. Hundreds of mechanics believe it to be the best hammer in use. Consider the usage a hammer gets, the necessity of "striking while the iron is hot," and the advantage of rapid blows retaining if not increasing the heat, and you will see that the old style hammer is justly preferred in nearly all steel and tool shops. It is not apt to get out of repair, can be run rapidly, does not rebound, can be readily adjusted to draw tapers, is easily managed, and will stand long the hard usage in plating or drawing thin steel which no cast iron hammer would bear.

The necessary movements to give a graduating blow only add unnecessary parts to be kept in order without giving in return any benefit to a good forger. It is nice to look at a hammer cracking a nut or drawing a shaft, but the peanut eaters do not employ a steam hammer when two stones will do the work. Would you?

The writer further states on the same page (161) that the ordinary trip does not strike a square blow except on a thin piece of work. Now, if the hammer comes down square on a thin so it will on a thick piece, if the dies are properly adjusted by being left slightly open toward the fulcrum; the hammer moves in the arc of a circle, hence the necessity of setting the die at an angle below the center.

Again, the trip does not fall by gravitation, as the writer asserts, but the weight of the blow is increased proportionably to the resistance necessary to compel the hammer to move up and down in the alternate spaces between the lifts or cams; the more force in lifting so is the blow heavier. A one hundred pound hammer lifted eight inches by cams and run four hundred blows per minute, strikes a blow of about a half tun weight. P. McC.

Newark, N. J.

[Our correspondent, whose practical suggestions, drawn from a long experience, have often enriched our columns, does not appear to have made out a very clear case for the superiority of the old fashioned trip hammer. We do *not* "see that the old style hammer is preferred in nearly all steel and tool shops," for quite a number we know have removed them and replaced them by direct stroke hammers because of the advantage of the latter in rapidity of blows and ease of manipulation. As to striking square blows equally on thin and thick work, our correspondent admits our statement by asserting that the dies on a trip should be "adjusted by being left slightly open toward the fulcrum." If so adjusted no square blow could be had on a thin piece of work except at the outer point of the dies, and the angle that would give a square blow on an inch square bar would not on one of two inches square; this is self-evident and requires no argument. He denies that the trip works only by gravitation and asserts that a "one hundred pound hammer lifted eight inches and run four hundred blows per minute strikes a blow of nearly half a tun weight." It is evident that unless the hammer has a spring, only its weight, plus the distance of the fall, *i.e.* gravitation, produces the force of the blow. In the case mentioned it is simply the force of one hundred pounds falling eight inches. What he means by the weight of the blow being increased proportionably to the resistance, etc," we are unable to comprehend.—EDS.

Planchette a Humbug.

MESSRS. EDITORS:—Having noticed your remarks some time ago with regard to "Planchette," I purchased one of the creatures, and I have it now in my possession some three weeks; and having myself, and some twenty or more of my friends, repeatedly tried it, we unanimously agree that it is a humbug. When two persons put their hands on it, it certainly runs about the paper (I should like to see two persons with nerves steady enough to keep it from running); but as for forming letters, that it will not do, unless one or both of the persons whose hands are on it scheme and help the instrument to form the letters.

In Messrs. Kirby's pamphlet they say: "Planchette is sometimes coy, suspicious, reluctant, will not work for the skeptical," etc. They are quite right, it will only work for those who make it work.

Probably, however, there are no spirits living in this cold country of ours.

Kingston, Canada. H. A. M.

ARCHBISHOP KENDRICK ON THE PLANCHETTE.—When we published our first article upon the "Planchette," we had not the least idea that we were engaged in anything very diabolical, but we begin to fear that we have "put our foot in it," especially as Archbishop Kendrick, of St. Louis, has instructed the clergy of his diocese to warn Catholics, that if they do not desist from the use of "Planchette," they will be excommunicated. The toy is pronounced a "diabolical invention."

TUMBLING BARREL.—In relation to the tumbling barrel which we illustrated on page 168, current volume, SCIENTIFIC AMERICAN, stating that we believed it had not been patented, Mr. J. S. Fifield, of Westerly, R. I., claims that he holds the patent for it under date of June 11, 1867. We can only say that we saw it in use, both as tumbling barrel and coal sifter, at least five years before that date in Hartford, Conn., and on that fact we based our statement.

How to Poison Children.

One naturally touches the point of his pen with great timidity at a reputation like that of the illustrious Liebig. But the learned professor, since his stay in Paris in attendance on the exhibition, has promulgated in the journals of science new food for children, which he declares is being fed with success to thousands of children in Germany; or, to use his own expression: "*A des petits tudesques par milliers.*" This food is a chemical compound intended to contain the component parts of human milk, and to be a substitute for it. To accomplish this object, that is to say, to furnish to new-born children, deprived for any reason of their natural food, a substitute, he went to work and reproduced a milk by chemistry, which, chemically speaking was correct, and which, he contends, children may take with perfect safety and advantage.

With such an authority as that of Liebig, therefore, the whole scientific world of Europe has been trying this new compound; for, to find a substitute for mother's milk, especially for the use of the foundling hospitals, is an immense desideratum. But here at Paris it was tried on but four children, and these four it killed—two in three days, and two in four days. The experiment was made at the Lying-in-Hospital of Dr. Depaul, professor of clinical obstetrics of the faculty of Paris, and the children selected were those abandoned by their mothers. The artificial milk quickly brought on bilious purging and prostration. Of course, Prof. Liebig declaims loudly against the fairness of the experiment; but Dr. Depaul is a competent judge, and the whole Academy of Medicine, after a fair report from the chemists in their body have decided not to take the responsibility of a further experimentation with so dangerous a compound. What is the use, the Academy judiciously says, since we have in our hands so excellent a substitute, and so nearly an analogous substance, in cow's milk with the addition of a little water and sugar? And upon this substance, which is so easily obtainable, the Academy has decided to rely for the feeding of the foundlings and all other children placed in their charge. Prof. Liebig has undoubtedly lost a point in this discussion.—*Paris Cor. Times.*

Electricity and the Sensitive Photographic Film.

M. Becquerel finds that chloride and bromide of silver deposited on plates of platinum, when acted upon by light, give rise to a strong current of positive electricity, which is just the reverse of the kind of current which would be afforded by the platinum plate alone under the same circumstances. Now the chloride and bromide of silver are actually decomposed by light—the former obviously so, the latter less visibly—yet the bromide indicates a current of even higher intensity than the former. The conclusion is, that a precisely similar action takes place when the light acts on the chloride and on the bromide of silver, viz., reduction to a subchloride and subbromide respectively. On applying this curious test to the iodide of silver, it was found that it likewise gave rise to a current of positive electricity under the influence of light of nearly as as high intensity as that afforded by the chloride. The inference clearly is that iodide of silver is reduced to a subiodide, just as the chloride is to a subchloride, and the bromide to its lower state of combination.

In following the various stages of the discussion of a vexed question, it is singular to notice the changes in the bearings of the numbers of facts presented from time to time. Until recently all the evidence seemed to be tending to support the purely mechanical theory of the formation of the latent image; latterly, the complexion of affairs has quite altered, and the evidence all tends in the direction of a distant chemical change as being the result of the action of light, the experiments of M. Becquerel, referred to above, forming a strong link in the chain. Will some ingenious experimentalist now step into the arena and propose a crucial test which shall decide this vexed question once for all?—*British Journal of Photography.*

Iron Experiments.

A simple illustration will serve to show two facts connected with iron:—The first is its elasticity, and the second the power exerted by the pressure of the hand of any person. Make a hoop of one inch square bar iron, about the size of the brim of a man's hat; let the inside of the hoop be made quite smooth and true. Such a hoop being examined, it would appear that the power even of a horse could in no way alter its shape or form, provided the strain be put to it fairly and equably. Now make a rod of iron of the thickness of a lead pencil, that shall exactly fit the diameter of the inside hoop so that, when placed in the hoop, it will not fall out unless the hoop be altered in shape. If, acting in a similar way, we took a child's wooden hoop, so that, when placed in the hoop, with a stick across it in the center, and then pressed it at the sides opposite to that of the cross stick, the hoop would assume an oval shape, and of course the cross stick would fall out. Just so does the iron hoop described act; when any one presses it the iron rod falls out, showing clearly the elasticity of the iron. The hoop will become oval shaped with a very little pressure, not greater than that which can be exerted by a young girl.—*Septimus Piesse.*

M. TOUMACHON, the photographer, recently performed a feat worth recording. Having ascended to the hight of nearly a thousand feet in the captive balloon at the Hippodrome, Paris, he succeeded in taking several photographic views, accurately representing the city from a birdseye view. The chief difficulty he encountered was the rotary motion of the balloon. His success shows the practicability of obtaining correct representations of the positions of military forces safely and rapidly.

TRANSMISSION OF HYDRAULIC POWER FROM ITS SOURCE TO PROPEL MACHINERY AT A DISTANCE.

The *Bulletin Mensuel* contains an interesting discussion of the above subject by M. Leloup. We herewith give an abstract of the article, with an engraving of the apparatus by which M. Leloup proposes to accomplish the desired end.

M. Leloup says that there exist many difficulties in reaching and utilizing water power generated by the fall of water, situated at great distances from the centers of population, which, as such, are also manufacturing centers. The finding of any means to transmit, and to distribute in any desired amount, the power thus generated, so that the baker might knead his dough, the blacksmith forge his iron, by the aid thus afforded, is a desideratum. Combustible substances are now used to such an unprecedented extent as generators of mechanical power that the day must come when other means must be sought for, so that the fuels now in use can be economized for those industrial branches which cannot dispense with them. In order to do this we should turn our attention to the natural powers which exist on all parts of the globe, from the power creating high and low tides, to the power generated by the descent of the smallest brook. These powers are immense in comparison with all the power used in railway locomotion and in workshops. M. Leloup demonstrates that in the falls of French canals alone there exists a motive power of 336,320 horse-power.

The study of the question involves the solution of the great problem of the use of compressed air. Air has the property of indefinite expansion and contraction. It requires no process of preparation to enable it to contract and expand at regular intervals. It is the commonest of the elements and its cost is nothing.

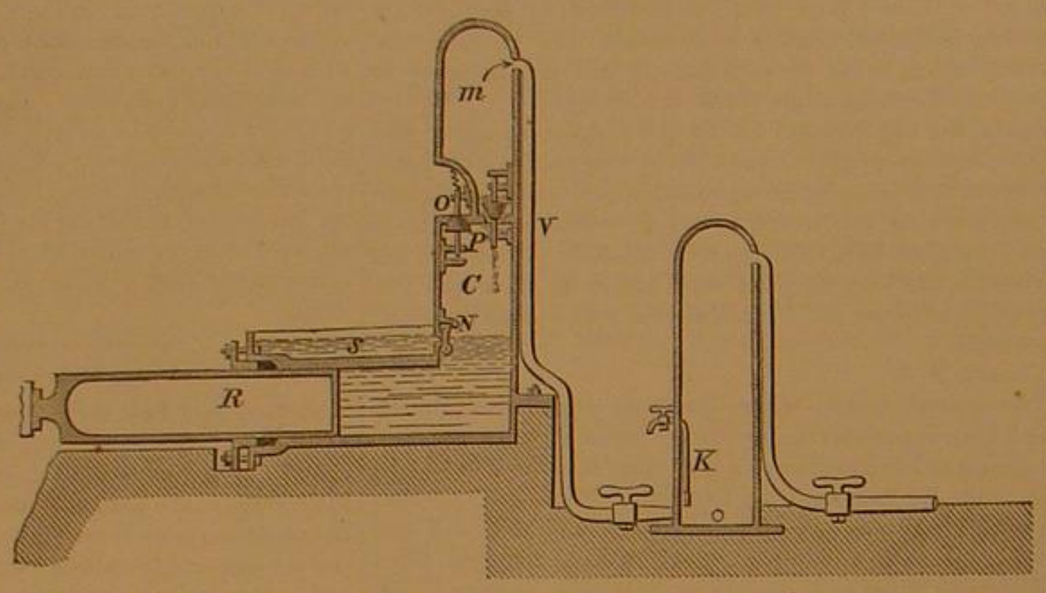
He challenges the attention and the objections of practical men to the plan he proposes, by which the power of any fall of water can be transported to any distant place. The task would seem easily accomplished, by means of a force pump at the waterfall, a reservoir at a distance, and a tube connecting both. Tubes from this reservoir would lead the power to different establishments in the same way, as steam is distributed from a boiler to different steam hammers. What can be done with steam can also with more reason be done with compressed air, for the latter possesses the useful qualities of steam with none of the disadvantages resulting from condensation. In large forges the tubes which convey the steam to the hammers have to be clothed with linen or other non-conducting material, to prevent condensation and consequent loss of power. This inconvenience necessitates the multiplication of generators, to suit the multiplication of machines beyond a certain limit. This condensation is often so great as to absorb the greater part of the power of the steam at the boiler.

Air compressed in a solid and well closed leading tube loses none of its pressure. M. Leloup and M. Lucare made an experiment with a common lead gas-pipe, 5-16ths of an inch in diameter and 150 feet in length, coiled as gas-pipes usually come from the factory, applying a pressure of eighteen atmospheres, as indicated by a manometer; the instrument for three months indicated the same pressure. This result shows the entire reliability of tubes for conducting power.

The transmission of power by the use of pumps is attended with some difficulties. The high pressures required (15 to 18 atmospheres) exact great perfection in the mechanism of the apparatus. A pressure of 16 atmospheres is difficult to attain by a common air pump acting directly upon air. To obviate this difficulty water might be introduced into the pump, so that by a peculiar construction the piston would constantly be in contact with water instead of air. This combination changes the problem from the compression of gas, which is difficult, to the pressure upon water, which is much easier. The water in this system being constantly in contact with the piston, would first receive force, and it is known that the common force pump is sufficient for imparting 16 atmospheres pressure to water. The proposed apparatus is thus described:

It is composed of a cylinder bent at right angles so as to have one branch horizontal and the other vertical. The horizontal branch of the body of the pump is designed to receive the piston, R; the lower part, C, of the vertical branch to receive the injection; and the upper part, *m*, to receive the compressed air. This latter part communicates with the reservoir, K, by means of the tube, V. The apparatus is completed by a valve, P, called the evacuation valve; a valve, O, called an injection valve; a third valve, N, called the feed valve; a reservoir, S, called the feeding reservoir, and finally by the piston, R.

In the examination of the operation of this apparatus, we must remember that the only function of the water in the body of the pump is to insulate the moving pieces from the air. Let us now move the piston from the extreme inner position. By this movement the level of the water in C, will be brought down to a level with the lower end of the opening of the valve, N. The air will enter by the aspiration valve, O, and will occupy the vacuum caused by the displacement of the water in the body of the pump. The piston in returning to the inner position will at the same time elevate the level of the water in C, so as to reduce its capacity to nothing, consequently forcing the air up into the compressed air chamber, *m*, even raising a small amount of water also into *m*, which serves to pack the valve, P, during the next aspiration caused by the motion of the piston. The feed reservoir supplies through the valve, N, the amount of water used in packing the valve, P, and the losses commonly realized in pumps. The water after it has accumulated in *m*, flows through the pipe, V, into K, from which it is at proper intervals drawn off by a cock provided for that purpose. The connection of the compressed air chamber to the places where the power is to be utilized is made by tubes of metal or rubber, provided with valves to prevent the return flow of the air.



An American Invention In London.

The London *Standard* thus speaks of a life boat invented by a citizen of San Francisco:—

"Charles Gunner, a mechanic all the way from San Francisco, California, has provisionally registered a new boat which possesses some distinctive features, and a model of which we have had the opportunity of inspecting. The boat, intended by the inventor to be used for saving life at sea, is 36 feet in length, and of the same proportions as the boats of the Royal National Life Boat Institution. It is constructed to carry 40 passengers and a crew of nine men. Twenty passengers are intended to be accommodated in a cabin erected midships, and ten each in fore and aft cabins. The self-righting properties of the boat are efficiently secured by two air-tight cylinders placed midships on the gunwales, each six feet in length and three feet in hight, and a central circular cylinder of the same length and three feet in diameter, which is placed between the side cylinders and moves to either side of the boat on a self-acting pivot. As a coast life boat, the principal objections would be found in the air-tight cylinders, which would be likely to be acted upon by the winds, to the detriment of its speedy progress through the waves; motive power would also be lost by the necessity of seating the oarsmen fore and aft. Ventilation of the cabins has not yet been perfected, but the inventor is sanguine of success on this point, without which, of course, it would possess no advantage over those at present in use. As a ship's life boat, however, there is no doubt that it would succeed admirably, its properties being such as to insure an effective launch under any circumstances and to enable it to live in any sea. The cabin could, in such case, be used for provisions."

ICE MACHINES.

Ice is not only a luxury in tropical climes or hot seasons which is beginning to be more and more appreciated, but the advance of civilization has made it a necessity for many industrial pursuits as well as for medical purposes. Taking then into consideration the difficulties incidentally experienced in gathering, storing, and transporting this substance, sometimes for thousands of miles, it is not to be wondered at, that attempts have been made, several years since, to make a practical application on a large scale, of the beautiful lecture-room experiments of making ice with the so-called freezing mixtures, with the reaction of previous heat, or with the air-pump. There are consequently three kinds of ice-machines; first, those acting by the cooling effect of certain chemical mixtures; secondly, those acting by the previous application of heat; and, thirdly, those by which the freezing is produced by the cooling effect of evaporation in a vacuum made by an air-pump. The first kind we may call chemical machines; the second, caloric ice-machines; and the third, mechanical ice-machines.

I. CHEMICAL ICE-MACHINES.

Chemical combinations often manifest, as a secondary result, a great change in temperature, sometimes a raise or heating, sometimes a descent or cooling of the resultant product. Everybody knows the enormous heating attending the combination of quicklime and water into hydrate of lime, or of sulphuric acid and water. The mixture of lime with sulphuric acid and water produces a red heat, and of sulphuric acid, nitric acid, and oil of turpentine produces even ignition. The same is the case with sulphuric acid and chlorate of potash; and this last peculiar property had been used for making lucifer matches, before the friction match was invented.

In other chemical combinations, cold is often produced. This is generally the case when the product of the mixture is liquid; on the contrary, when no liquefaction takes place, heat is the result. An intense cold is obtained when salt is mixed with snow or pounded ice; in this case, however, it is simply the strong tendency which salt possesses to dissolve in water, which forces, as it were, the ice to liquefy in order to procure water to the salt. If we force a solid to liquefy, or melt without giving it the heat necessary as latent heat for this liquefaction, it will take this heat from the sensible heat, which will then diminish, as it will become latent in the liquid; the sensible heat being the only heat the thermometer indicates. A similar effect is produced when dissolving other salts in water or any other liquid; the descent of temperature being very different according to the nature of the substances.

Thus, five parts of sal ammoniac and five parts nitrate of potassa dissolved in sixteen parts of cool water will cause the temperature to descend about 20° Fah. Nine parts of phosphate of soda dissolved into four parts diluted nitric acid, will cause a descent of temperature of 50°. Six pounds of sulphate of soda gradually dissolved in five pounds of hydrochloric acid, will cause such a descent of temperature that it will freeze from five to six pounds of water in the course of one hour. This ice dissolved in alcohol will cause the temperature again to descend more than 50°. The most remarkable mixture of this kind, discovered by Berzelius, and producing the most intense cold, is the following:

Two or three pounds of chloride of lime is heated until it forms a porous mass, and is powdered and passed through a sieve, by which operation it absorbs just enough moisture as is necessary to cause it quickly to dissolve in water. It is then mixed with half its amount of snow, in a wooden vessel placed in a mixture of snow and salt. In the interior of this cooling mixture, mercury or ether may be frozen when introduced in a platinum crucible or glass ball.

When this powdered chloride of lime is dissolved in half or two-thirds its amount of cold water, it will easily freeze water when introduced into the mixture in a proper vessel, and this may perhaps finally be found a cheaper freezing mixture than any of the common ones now in use, as by simple evaporation the original salt may be regained.

Lately a small machine has been introduced to the trade, similar to a large cream freezer, in which about one gallon of water could be frozen in the course of one hour. One of the above-mentioned freezing mixtures is the agent by which the result is accomplished. The machine itself being simple in its construction is, of course, not costly, but as the chemicals used are bulky and as a large amount of them is required, it is inconvenient and expensive. This kind of machine promises only to be of very limited practical application. The cheapest material to produce cold being the above mixture of sulphate of soda and hydrochloric acid, the first of which costs at present, wholesale, 3 cents, and the second, 6 cents a pound; making the cost of six pounds of ice 42 cents or 7 cents a pound—a price which can never compete with that of natural ice except in out of the way localities in the extreme southern States, where ice is occasionally sold for 10 cents per pound, and often cannot be had at all.

If the chemical products of the freezing mixtures had any commercial value it would diminish the price of the ice produced, but unfortunately this is not the case. For the benefit of those who wish to use such machines, or experiment in this line we give here the result of experiments with some of the best cooling mixtures.

TABLE OF COOLING AND FREEZING MIXTURES.

MIXTURES.	PARTS.	DESCENT OF THERMOMETER.
Sulphate of Soda	6	60°
Chloride of Ammonium	4	
Nitrate of Potash	2	
Diluted Nitric Acid	4	
Sulphate of Soda	6	66°
Nitrate of Ammonia	5	
Diluted Nitric Acid	4	
Sulphate of Soda	8	50°
Hydrochloric Acid	5	
Nitrate of Ammonia	3	34°
Diluted Nitric Acid	4	

Experiments have proved that the addition of common salt is not advantageous when no snow or ice is used in the mixture, but that, on the contrary, it diminishes the cooling effects of other salts, and in some cases even produces a rise of temperature of a few degrees. This is especially the case when common salt is dissolved in any of the previously made solutions of chloride of ammonium, sulphate of soda, common saltpeter, or nitrate of soda. When, on the other hand, one of the four last named substances is dissolved in a previously made solution of common salt, a descent in temperature of from 10° to 20° Fah. is the result. This is only mentioned to show what an immense field of investigation there is yet open in this special branch alone.

Social Science in the West.

A call has been issued signed by a large number of professional men, as well as many who do not lay claim to that title, for a meeting to be held in Chicago, on the 10th of November next, at some place to be hereafter announced, to organize a Western Social Science Association.

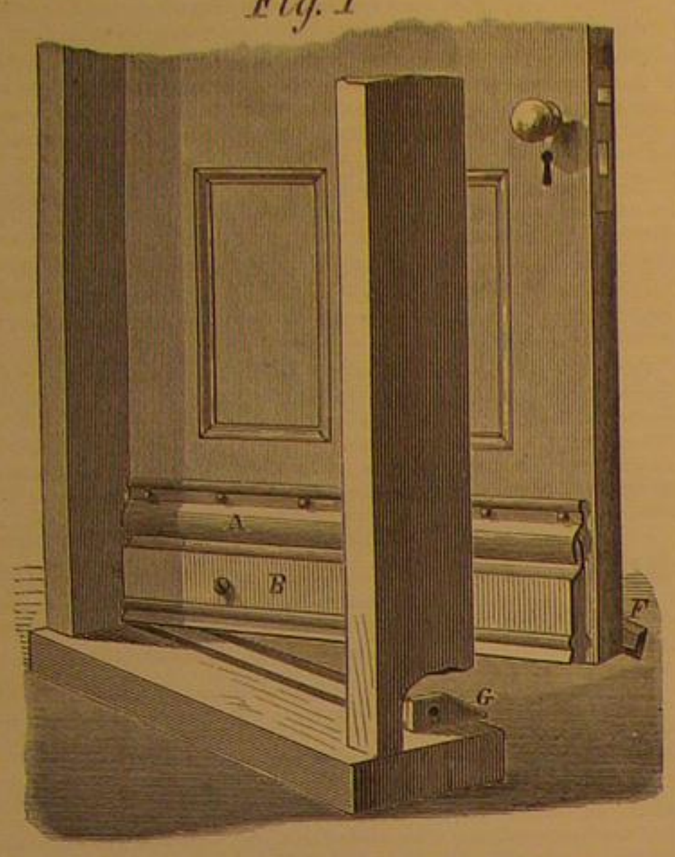
It is stated that the organization is intended to be similar in character and design to the British Social Science Association, and the coöperation of the most able and earnest men in the West is hoped for as well as the sympathy and coöperation of all public-spirited citizens throughout the United States. A number of valuable papers are promised, and the subjects of education, public health, and jurisprudence will be freely discussed. The Association is designed to be kept free from sectarian and party influences, and its discussions will be published so far as its funds will permit. We most heartily wish this and all other efforts to correct the prevalent evils of society the utmost prosperity and success.

THE manufacturing establishments of Lawrence, Mass., were honored lately by a visit from the Chinese Embassy. The busy activity of a New England manufacturing town, must excite the extreme wonder of these Orientals.

AVERILL'S METALLIC WEATHER STRIP.

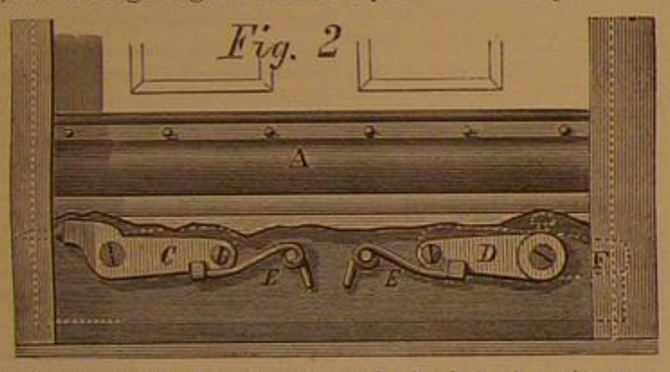
Those weather strips generally in use which depend for the closing of the joints between doors and windows and their frames on the elasticity of some substance, as rubber interposed, sometimes become unreliable by wear, and require renewal or repairing. The one which the engravings illustrate

Fig. 1



is of metal, and its operation is absolute. It consists of a beaded or corrugated strip, A, nailed or screwed to the door by its upper edge, and slightly projecting from the door at its lower edge to receive the upper edge of a plate, B, also of corrugated sheet metal. This plate is held in place by two screws or rivets which pass also through the long arms of the levers, C and D, Fig. 2. The springs, E, same figure, are coiled around pins in the door, and serve to throw the long ends of the levers up when once depressed. It will be seen that, if these levers are either depressed or raised, the slide, B, must move with them. This movement is produced on the lever, C, at the hinge edge of the door by a screw in the jamb of the

Fig. 2



door, the head of which meets the backward projection of the lever, C, depressing the other end, and with it that portion of the slide. As the door nearly reaches the closing point, a latch, F (dotted lines in Fig. 2), is made to move by sliding up the incline of the catch, G, thus lowering and firmly closing the slide on the sill. The contrivance may be adapted also to windows by a slight modification.

The patent, obtained through the Scientific American Patent Agency, is dated July 7, 1868. State and County rights, or the strips themselves, may be obtained by addressing the patentee, B. F. Averill, Dunkirk, N. Y.

FRUIT CAR—EASTERN MARKET FOR WESTERN PRODUCTIONS.

On Wednesday, Sept. 9th, we made an examination of a railroad car built specially for the transportation of fruits, fresh meats, game, etc., over long distances. It is known as the Davis' Fruit Car, built for the purpose of conveying perishable articles of food and preserving them from decay. The sides, ends, and roof of the car, are about seven inches thick, composed of the outer shell of plank, an air space, and a space packed with wool, felt, or other non-conductor. On the sides, inside the inner shell, are cases of zinc, reaching from the floor to the roof, and filled with broken ice, sprinkled with salt. The interior of the car showed, by the thermometer, a temperature of 40° Fah., and the cargo—peaches picked near Cincinnati, Ohio—after a voyage of six hundred miles, and a confinement of ten days, proved, on experiment, to be perfectly fresh and sound. This fact is, of itself, sufficient to show the value of the invention. It will, if properly managed, give a new impetus to the agricultural industry of the West and South, provide the craving East with fresh fruits and meats at a cheap rate, and be a new bond of interest connecting distant sections of our common country.

We hope, soon, to publish an illustration and full description of this improvement.

The Velocipede Fifty Years Ago.

The "velocipede," which is now attracting attention, is simply a new name for the same kind of invention which was in quite general use some fifty years back. It was then called a "dandy horse," in England, probably from their use being mostly confined to the dandies of the period. At that time the fashionable men might have been seen on any of the popular drives, propelling along, with their coat tails at an angle of forty-five degrees, to the infinite satisfaction of themselves and the envy of the non-possessors of the coveted establishment. The vehicle of that period was constructed like those lately introduced, excepting that it lacked the pin on the front wheel by which it could be kept going when once fairly started. It was propelled by the feet upon the ground, and after a good speed had been attained, the feet were temporarily rested upon a small projection at each end of the front axle until the horse required further propulsion. The dandy horse, however, died out of use about the year 1820, in some measure owing to several serious accidents through their use, chiefly ruptures, which the springless nature of the rider's seat was very apt to produce. But they were in high feather once, and Fox, Sheriden, Pitt, and other notables of the period patronized them extensively in St. James' Park, taking their "constitutional" on the dandy horse after a hard night spent in the House of Commons, or around the gaming table.

WHAT SCIENCE OWES TO MISSIONARIES.

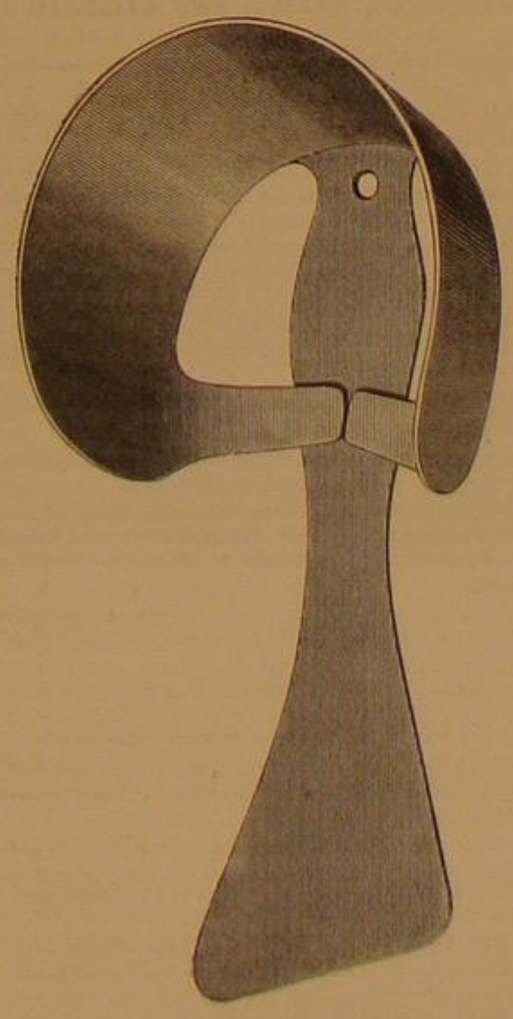
Far away upon the extreme verge of civilization, or isolated from it entirely, are a corps of humble workers. Bearing the tidings of mercy to the lands that sit in darkness, they gather up scattered pearls of knowledge and send them back to enrich the stores of those, who, laboring in another field, are coworkers with them in the elevation of the race. Scarcely any of the sciences can claim that they have not been indebted to missionaries for valuable facts. The sciences of philology, ethnology, archeology, geography, and zoology, have however received more aid from them than many others. An exchange makes the following remarks in reference to this subject:

"To Dr. Livingstone, the distinguished missionary explorer, is the world indebted for the most of its knowledge of the interior of Africa; and it now appears that the first discoveries of the sources of the Nile were made by missionaries. Some missionaries of the Church Missionary Society in East Africa, in order to acquaint themselves with the native tribes, made exploring tours to the interior, in one of which they discovered a snow mountain, and after a time another. The statements which they sent to England were at first received with incredulity and ridicule. After some time they reported that the natives declared that there was a great inland sea; when the Royal Geographical Society sent out an expedition, which resulted in the famous discoveries by Captains Speke and Grant and Sir Samuel Baker of the great lakes, called by them them the Victoria Nyanza and the Albert Nyanza, the sources of the great river of Egypt."

Dr. Kane received valuable aid and counsel from the Moravian Missionaries, on the coast of Greenland, in his celebrated Arctic explorations. The Catholic priests who penetrated the wilds of America, intent upon the conversion of the savages, contributed largely to the early knowledge of the geography of the American continent, and the information given by missionaries in China and Japan has been the origin of the negotiations which have resulted in the opening of the ports of those countries to commerce and civilization.

SAVOY'S PATENT METALLIC BOOT AND SHOE SHANK.

Some boots and shoes do not "live out half their days" simply for want of proper heel staying. The mixture of



leather skivings and paste, often if not generally used for heel stiffenings, is all that is required so long as kept dry; but when softened by the perspiration of the feet or exposure to rain it breaks down, and for use and comfort the boot or shoe is valueless.

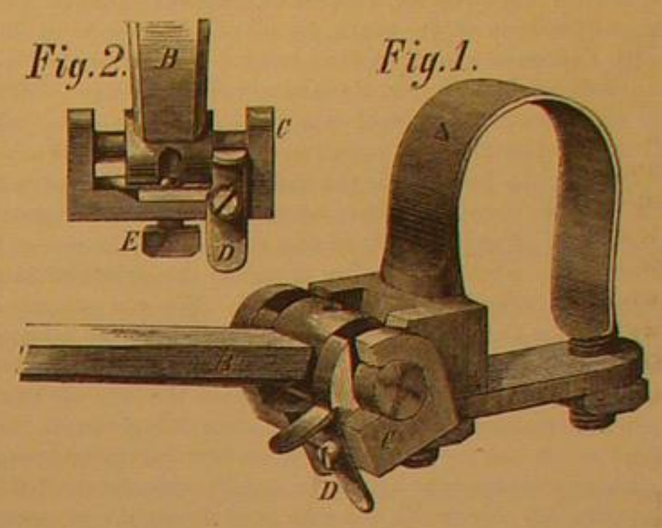
The accompanying engraving presents a view of a metallic shank intended to be a permanent support to the heel. It is cut out of sheet metal in one piece and then "struck up" or formed by dies. The strip or shank that passes under the foot lengthways may be made to act as a spring, if the material used is of sufficient density and hardness, as rolled sheet brass or sheet steel. Its application to the shoe is easily seen. The metal being entirely covered no portion of it comes in contact with the foot of the wearer. It may, if necessary, be secured by one or more rivets, screws, or nails.

Patented through the Scientific American Patent Agency, Sept. 1, 1868, by Michael E. Savoy, Luzerne, Warren Co., N. Y., who desires to dispose of rights upon reasonable terms.

M'CREARY'S PATENT CARRIAGE CLIP.

The design of this improvement is to prevent the vexatious rattling of the shafts of a carriage and to permit them to be instantly removed or replaced. Usually the pivot is secured to the clip, but in this case it is at the end of the shaft. The ears of the clip, A, are not bored, but slotted, forming hooks which receive the ends of the pins or pivot. This pivot passes through the shank, B, and is secured in the ears of a strap, C, which thus forms a part of the carriage shaft and when the shaft is in place its ears are outside those

Fig. 2. *Fig. 1.*



of the clip. A light spring, D, on this strap engages with a notch on one of the ears of the clip and prevents the strap from turning and the end of the shaft from becoming disengaged by jolting. A set screw, E, through the bottom of the strap, C, is seated in a partially circumferential slot on the shank head, and prevents all rattling by lateral motion while it allows sufficient vertical movement to the outer end of the shaft. By a slight pressure on the spring, D, the strap, C, is allowed to turn so the shaft may be lifted out of the hooked ears. Carriage makers will easily understand the construction and operation of the device. Fig. 1 is the clip and the attachment complete, ready for use, and Fig. 2 the shaft shank and strap without the clip.

Patented July 28, 1868, by Thomas McCreary, assignor to himself, George B. Sullivan, and John McCreary, all of Matteawan, N. Y.

HALF A DAY AT COLLINSVILLE.

A correspondent thus graphically describes what he saw in a recent visit to the works of the Collins Company, at Collinsville, Conn.:

Collinsville, town of Canton, Hartford county, is a brisk place. The village is only an overflow of The Collins Company, but the effervescence of industry has driven the foam of new houses up and down the green banks of the Farmington river, and here and there the white bubbles have been caught and held aloft upon the steep hillsides. From a single old mill, which David C. Collins and Samuel W. Collins began with forty years ago, has sprung a great multitude of houses, three churches, two hotels, a bank, schools, libraries, and all the auxiliaries of a population of three thousand.

In that old mill Collins & Co. began as ax-makers, with an ambition to make the very best tool that could be produced, regardless of the cost, believing that such a tool would inevitably win its way. They were right. It would seem as if the artisans of the blunt, rude axes previously made must have been men of sentiment, forging the tool to execute the purpose of the song, "Woodman, spare that tree!" Collins & Co. held that the ax ought to respond to the needs of the woodman, as much, at least, as to the romance of the trespassing protecior of the "shade;" so they made an ax keen as to the edge, ground and polished as to the sloping check, solid as to the eye—such an ax as had not before been seen. The success was immediate and immense. From Maine and Canada, from the South, and from the farthest Western frontier, from Spanish America, and from the Islands of the Sea, came a call for the new axes. The fortune of Collins & Co. was made.

In 1834 the Collins Company was organized under a legislative charter. They multiplied their mills until now they stand thick set, twenty-three in number, and so spacious that if they were stretched out on a single floor, they would measure twenty-five feet wide and a mile and a quarter long! They multiplied their wares, turning out, in addition to axes, also hatchets, adzes, mining tools, crowbars, sledge hammers, the long Spanish knives called machetes, and many agricultural tools. They increased their capital to $800,000, and have regularly declared satisfactory dividends.

A large item of their trade for years has been the Spanish tools—knives, axes and machetes. The semi-Spanish nations of Central and South America were formerly furnished with their weapons and implements from Europe, but they now receive them almost wholly from the United States, and very largely from the Collins Company. They probably found these articles of superior quality, both in stock and finish, to justify the partiality.

The Spanish tools are of peculiar pattern, and would not

find extensive sale hereabouts. The knives are gotten up in various shapes of ferocity, some of them similar to those seen in the hands of the lowering gentlemen who attitudinize in the *New York Weekly* and the novels of the sanguinary marine school. The machetes are quite different from our cane-knives, being as long as swords, and resembling them, but broader at the end. Of these the Collins Company has manufactured more than three hundred patterns, and they are made from the very best of steel. Here is another tool which not even the sharpest Yankee could guess the use of. It has a handle like that of a knife, and the blade is eighteen inches long, and eight or ten inches broad in its broadest part, toward the end, and an eighth of an inch thick, ground to an edge, and polished all over. What is it? A weapon for defence or offence, you would say; possibly a heavy pruning knife, or a light butcher's cleaver. Wrong again. This is a Brazilian hoe! The rural operator squats down by a hill of corn, holds the handle in the right hand near the ground as a pivot, and grasps the end of the blade with his left hand and moves it mildly around toward the roots, poking the soil up to the little hillock! Perhaps this seems very primitive to us, but it is quite certain that our method seems as foolish to our brethren of the south, for when a Yankee went down with a cargo of our hoes, they refused to tolerate the "awkward things," but forged them into hoes of their own fashion. Of these tools—mainly of the cane machetes—the Collins Company manufacture sometimes more than 200,000 a year.

During the last decade the Collins Company have "taken hold of the plow," and have brought it to a high degree of perfection. They make it of cast steel—the only one of the kind in the world. The plow is one of the oldest of implements fashioned by the human hand. We can scarcely be certain that Cain had a plow of his own when—a young man of a hundred and fifty—he farmed it on a small scale and without great success in the suburbs of the city of Enoch, "to the eastward of Eden;" but even Adam might have lived to see one, for he exhausted the best part of a thousand years, and doubtless he held the sparks fly from the anvil of Tubal Cain, his blacksmith descendant of the eighth generation. And if they had iron, is it not probable that they made some sort of rude plow?

The first plow of which we have any description is figured roughly on the monuments of Egypt. It seems to have been a mere wedge, with a short beam and a crooked handle. But Moses and Samuel speak of the plow, and even at that early day it possessed both a coulter and a share, as we learn from their similes. The plow of the Israelites, like the modern plow, was drawn by a yoke of oxen, and it was forbidden by law to yoke an ox and an ass together. The early Greek plow had a wheel. Most of the old rustic authors referred to the plow; Virgil wrote of it in the Georgics; Homer sang of it; and Pliny, Hesiod, and Strabo spoke of the methods of making it. Varro tells of a plow with two mold boards. The plow of the ancient Britons was very rude; no man was regarded as fit to be a farmer until he could make his own. The custom was to fasten the plow to the tails of the oxen, and compel the beasts thus to drag it through the ground. An act of the Irish Legislature was passed in 1634, entitled "An Act against Plowing by the Taile," which prohibited the cruel custom. The old Scotch plow was thirteen feet long; the iron part proper being over four feet. The Dutch originated the present style, and brought the plow of the last century to the highest perfection. Thomas Jefferson, before he became President, patented an excellent plow, of which he avowed that the shape of the mold-board was mathematically correct to obtain a perfect furrow with the lightest draft.

In 1860, Mr. F. F. Smith, a shewd, ingenious blacksmith, made his appearance at the Collins works, told what sort of a plow he thought was needed, and said he believed he could make it. The Collins Company cordially joined him, and the result was a plow cast solid from cast-steel, the first ever made. It was found equally adaptable to turf, stubble or fallow land; and those who have used it, aver that it draws easier and takes a land polish better than any other plow. It costs more, too; but it lasts four or five times as long. Any part can be obtained at any time, if necessary to renew it. The share may be heated and drawn out from time to time by any blacksmith. One hundred plows were made, and sold with great difficulty, in 1861. Now, fifteen thousand a year are made, and this patent is rapidly superseding the unreliable sheet-steel plows on the prairies of the West. Such a sudden capture of the market is almost unprecedented in agricultural implements. These plows have been broken here and there to prove their quality, and pocket-knives, cork-screws, saws, and cold-chisels have been made from the fragments. Of some such malleable stuff must the plows have been made that turned up the valley of Jehosaphat; for Joel (chap. iii. verse 10,) calls upon the farmers to forge them into swords. The cast-steel plow of Collins Company is now used, not only in every State of the Union, but in Spanish America, Australia, New Zealand, and in several of the countries of North-western Europe. And still it rapidly extends its peaceful empire.

Have we time for a hasty glance through these works that spread their roofs under the hill like a Japanese city? Let us approach, and enter the low-browed Tartarus. Here at the left is the converting furnace where bars of wrought-iron are thrust into pulverized charcoal, and in a fortnight come forth bars of steel, having found marvelous properties in the contact. Wrought iron is merely a pure iron—a chemical simple—it attains the wonderful adaptability and excellence which give the name of steel, by receiving one-half to one per cent of carbon; and on receiving five per cent of carbon, its form has experienced another radical change, and it has become cast-iron.

Within these inner shops are sweating laborers—a whole regiment—forging the weapons wherewith the farmer and pioneer are to subdue Nature from her rebellious moods.—Here they "Heave O!" under great derricks, and swing tuns of crude metal into place; here they dodge to and fro in the blaze of an awful furnace, grimly suggestive of the quarters which I trust have been prepared in the nether worlds to swallow up hereafter all who don't believe as I do; here they move caressingly about sundry tender moulds; here they preside over a monster like a wool picking machine, into which craws a wheel with long machetes thickly clasped on its periphery—the monster utters a muffled scream, and the dull blades come forth ground and gleaming; here they couch before two score of mighty trip hammers that shout their metallic salutations; here they hover over half a hundred great grind-stones, pressing to the rough attrition, axes, plows, hammers, wrenches, hatchets—stones whose predecessors have burst like bombs, and shot up through the smoky roofs, at the risk of limbs and human heads; here they warily watch huge ovens where tools are baking, and huge tubs where tools are cooling. A vast machine this is—vaster than the spectral shops where the Titans forged the shield of Achilles—and into it go, every year, 10,000 tuns of coal and 6,000 tuns of iron, and out of it fly, over States and seas, 5,000 tools a day!

Does the reader know how an axe is made? A bar of heated wrought-iron is cut up into chunks, and an eye is punched into it by the same movement; then it goes into the bitt shop, where a piece of steel is clasped and welded to the iron and drawn to the edge, then to the temperers to receive their delicate manipulation; then into the grinding shop; then to the polishing shop; then to the blacking room, where the asphaltum is put on to protect the head of the axe; then to the packing room. And while passing through each one of these processes, the instrument is handled by a different professional inspector, and if there is a flaw, or if the temper is faulty, back it goes to the beginning. The Collins method is especially characterized by this rigid scrutiny which assures an excellence remarkably uniform in each completed tool.

The company is managed by a board of eleven directors, all of whom reside in Hartford, except two. One of these is Samuel W. Collins, who has been connected with the company ever since it was established, and whose name and skill first gave eminence to the firm. It has never been my fortune to meet him; but I am told that while maintaining strict discipline, he is very public spirited, and beloved throughout the town. The other is Vice-President Wm. J. Wood, Mr. Collins' enterprising associate.

So much in forty years; how much in forty years more? say, about the year of grace, 1,900? What other wheels and shafts and furnaces and forges will be added? What other inventions? What miracles of steam? What other working bees will buzz through this sweltering hive? And what other homes, flanked with rich gardens, will blossom up and down this valley? May it not, until long after the dawn of that century day, be called from the peaceful fashioning of plow and axe; and may the company be as happy in its president then as it now is in that last of the Cheeryble Brothers, who give to the business his methodical wisdom, and presides with unanimous acceptance, over the village of iron workers.

W. A. C.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The Stark mill of Manchester is putting in two turbine wheels of 500 horse power.

The Saginaw Valley, Michigan, it is stated, will ship this season over four hundred feet of lumber to the Western cities.

A correspondent writes that a large deposit of emery has been discovered near Middletown, Conn. He states that numerous tests have proved its quality to be equal to the imported.

The Directors of the Boston, Hartford, and Erie Railroad have completed contracts for the entire distance from Boston to Fishkill, and expect to have it finished before the end of 1869.

Tin mines have been discovered in the Pollock district, Colorado. Two promising mines are being worked reported to yield ore containing seventy-five per cent of metal.

Out of 8,240 barrels of flour inspected at Philadelphia last week only 229 were condemned.

Northern capitalists have bought the old Court House at Macon, Ga., and are going to occupy it as a cotton and woolen mill.

The gold mining interests of Nova Scotia are looking up. A considerable number of mines are steadily worked, and prospecters are quite numerous. A new paper has been started in Halifax in the mining interest called the *Mining Gazette*.

It is said that Pittsburg capitalists have an eye upon the manufacturing facilities at Joliet, Ill., and contemplate the erection of large iron works at that place.

Twelve cars of freight were recently taken from New York to the present termination of the Pacific line, 1,200 miles west of Chicago, a distance of about 2,100 miles from the starting point, without transhipment.

WATER SUPPLY OF PORTLAND.—Portland, Me., is to be furnished with water from Sebago Lake about sixteen miles distant. The trenches for the mains are being rapidly excavated.

ECONOMY OF SCREW PROPELLERS.—Owing to the economy produced in the consumption of coal by the substitution of the screw for side wheels, the sum of $49,400 is annually saved to a single line of French steamers running to New York.

ENGLISH AND AMERICAN RAILWAY CARRIAGES.—Three American carriages weigh only one ton more than two of the English make, and will seat seventy-two more passengers. They are also more durable, and for these reasons are much preferred in South America, which depends chiefly upon the United States for its supply.

The Hartford & New Haven R.R. Co. are relaying portions of their road with steel-headed rails, which are fastened with screws and rubber washers in such a way that the destructive jar of the trains is almost entirely obvisted.

PHENOMENON IN INDIANA.—A portion of the track of the Bellefontaine and Indianapolis railroad, about 250 feet long, sank fully sixteen feet and the ground around sank with it. Traffic was interrupted until the track was raised by "cribbing." Fish from twelve to eighteen inches appear where the water has risen out of the crack. A subterranean lake is supposed to exist under the track.

CAVING OF THE CHICAGO RIVER TUNNEL.—The heavy rain and the breaking of the water pipe caused a section of the tunnel now being constructed under the Chicago river to cave in on the 2nd inst. The temporary railroad bridge on West Water street, an immense derrick, and the engines attached went down in ruins. The loss is estimated at $25,000.

FREIGHT TRAIN ACCIDENT.—A freight train on the Boston and Albany railroad broke through a bridge at Russell, Mass. Just after the engine had passed over, thirteen cars, two of which contained kerosene, went into the chasm. Eight minutes later the kerosene exploded and the fire destroyed the cars and part of the bridge.

Dr. Lewis Feuchtwanger has sent us a specimen of pyrolusite (peroxide of manganese) which is as fine a specimen as we have ever seen. It was taken from the Pembroke mines in Nova Scotia and contains by analysis 36 per cent oxygen. It is entirely free from iron and is beautifully crystallized.

The contractors who built the Metropolitan Underground Railroad in London have made a provisional offer to construct the proposed underground road in New York city, and to furnish all the capital required to complete the road which the projectors may fail to obtain at home.

Large works have been recently established for the manufacture of chrome iron in Maryland and Pennsylvania. The demand for this metal in the arts has largely increased.

The first iron bridge made on what is called the solid lever plan has just been completed. It has a span of fifty feet and is fifteen feet wide. It weighs only five tuns. It was tested in Boston on the 2d inst., and sustained a distributed load of 86 tuns.

THE OPHIR MINES.—The returns of the Ophir mines for the month of June amount to 337 ounces, while for the month of July it was only 247 ounces, operations being interfered with by low water. A heavy rain storm on the 22d of August again filled the steams so that there is now enough water to run the crusher at full speed. A new lode has been discovered in the Ophir ground fifty feet from the old "South Lode" which gives good promise.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

FARM GATE.—Lewis Charles, Clear Springs, Md.—This invention is a neat, cheap, and easily constructed slide gate, so arranged and operating that it will ordinarily open a passage wide enough to admit a single animal; but, when necessary, can be easily opened to admit a team of any size.

MACHINE FOR MOLDING AND PLANING IRREGULAR FORMS AND CURVED SURFACES.—J. P. Grosvenor, Lowell, Mass.—In this machine there are several improvements upon those heretofore in use, including a new method of constructing the table to prevent its jarring and vibrating, a new feeding device for the manufacture of curved frames, and a new method of adjusting the cutters.

MACHINE FOR PLANING AND MOLDING IRREGULAR FORMS.—J. P. Grosvenor, Lowell, Mass.—The object of this invention is to obtain a simple and inexpensive attachment to machines for molding irregular forms, by which the operator, while leaning over the table of the machine and closely inspecting the operation of the cutter, will be enabled to adjust the cutter head up or down, to any required degree, without removing his eye from his work.

SPUR WHEEL.—C. F. Woodruff, Newbern, Tenn.—This invention is an improvement upon the device patented by the same inventor, May 5, 1863, No. 77 709, and consists in forming the cogs with shoulders so expanded as to bear against each other all around the rim of the wheel, and in trifurcating or dividing the outer ends of the spokes, or radial arms, in such a manner that the inner ends of the inserted cogs shall be inclosed and firmly held between the forks of the radial arms, whereby the whole wheel is made stronger and firmer than as heretofore constructed.

FANNING MILL.—Wm. Stoddard, Winona, Minn.—This invention consists of an improved agitating apparatus for facilitating the feeding of the grain from the hopper. Also, an improved apparatus for separating oats or other long grains from wheat. Also, in combination therewith, of an improved screening apparatus for separating cockle and other small grains from the wheat.

RECTIFYING APPARATUS.—W. G. Barette, Canton, Md.—This invention consists of an arrangement of condensing chambers and a cooler for separating and returning the oils. Also, of a condensing and returning apparatus for the low wines; and also of an arrangement for taking off the low wines at the latter part of the operation.

STOVEPIPE SAFE.—Gunder E. Hammer, Rochester, Minn—The object of this invention is to provide a ready means of access to the air chamber of that class of stovepipe safes which are constructed of sheet metal in two parts, having an air chamber between them and provided with openings for the passage of air through the said chamber. It consists in constructing one or both ends of two parts and hinging one of the said parts to the cylindrical portion.

LAMP CHIMNEY CLEANER.—M. N. Lovell, Erie, Pa.—This invention consists in one or two curved handles provided with clamps, whereby a number of slips of soft paper may be clamped to the said handle upon the bent portion thereof in such a manner that the slips may be turned over like the leaves of a book, and one after another used as they become foul, the said cleaner to be inserted in the chimney when used, in the ordinary manner.

KNITTING MACHINE REGISTER.—B. B. Bolinger, Louisville, Ohio.—This invention consists in providing a pattern wheel the periphery of which is provided with notches, corresponding in distance from each other with the changes required to be made in the knit fabric, and which is operated through the medium of gearing connected to a ratchet wheel which receives motion from a pawl connected to some regularly intermitting moving part of the knitting machine, the periphery of the said notched wheel causing a bell hammer to strike as each notch passes a given projection on the arm of the bell hammer, different signs and figures of pattern wheels being provided for different kinds of work.

CORRECTION—RUBBER BILLIARD BALLS.—In our notice of this new invention, on page 167, current volume, it was incorrectly stated that "the constant expense for renewing the stock of billiard balls amounts for each table to $32 for eight sets per year." But the fact should have been stated thus: The expense of renewal is from $25 to $35 each set per year.

ENVELOPE.—Sigismund Ullman, New York city.—This invention relates to a new and improved mode of cutting envelopes, whereby the same, when folded and fastened or sealed, will not admit of letters or documents being abstracted without defacing or tearing the envelopes. The invention further relates to a new and improved application of an eyelet seal or fastening to the envelope, whereby the former are permanently attached to the latter, so that they may be sold with them, and purchasers or users enabled to seal the envelopes with the greatest facility.

BRICK MACHINE.—Peter Hayden, Pittsburg, Pa.—This invention relates to a new and improved machine for molding and pressing bricks, and it consists of improved means for conveying the clay from the crushing or rolling mill to the press boxes, and also in a novel and improved construction and arrangement of parts for molding and compressing the clay and discharging the same after being compressed.

ENVELOPE.—S. Ullman, New York city.—This invention relates to a new and useful improvement in envelopes, and has for its object the folding of the ends of an envelope in such a manner as to effectually preclude the possibility of letters or money (bills) being abstracted without tearing or defacing the envelope. Letters and money are at present frequently abstracted from the ordinary envelopes by means of a bent wire and other instruments without injuring or defacing them in the least.

COOKING APPARATUS.—J. S. Field, Brooklyn, N.Y.—This invention relates to a new device for boiling by steam various articles in one single vessel, which is divided into various compartments by fixed partitions, so that the articles to be boiled may be separated from each other that they might retain their original flavor.

WATER WHEEL.—Vincent M. Baker, Preston, Minn.—This invention relates to a new and improved water wheel of that class which are placed on a vertical shaft and are commonly termed "horizontal wheels."

POCKET-BOOK PROTECTOR.—Alfred Arnemann, Guttenberg, Iowa.—This invention consists of a spring catch attached to the pocket-book, and of a wire clasp fastened to the pocket or garment. The spring catch can be easily fastened to the clasp, whereby the pocket-book will be securely locked in the pocket or to the garment.

FACE TESTER FOR MILL STONES.—James Kuhn, Mount Pleasant, Penn.—This invention relates to a new and useful substitute for the "staff," which is now used for marking the faces of mill stones in order that they may be cut down and brought into a plane when rendered uneven by wear.

LOCOMOTIVE BOILER.—Quintin Parker, New York city.—This invention relates to a new manner of constructing the fire places of locomotive boilers, and its object is to produce a boiler in which the lower flues cannot be clogged by cinders and ashes, and in which a fire place of just sufficient size is arranged. The invention consists chiefly in the application of a discharge channel, through which the ashes, cinders, and other impurities can, from the inclosed plate in rear of the flue sheet, fall to the ground so that thereby the lower flues are kept clear.

GRAIN MOISTENER.—L. J. Adams and J. H. Esale, Avon, Ill.—This invention has for its object to moisten and toughen the bran of hard or frozen wheat and soften the berry so as to raise the quality of the flour and facilitate the bolting of said flour.

BIN FOR SUGARS, TEAS, ETC.—Morgan L. Rich, Sand Bank, N. Y.—This invention has for its object to improve the construction and arrangement of sugar bins so as to make them more convenient in use, the bins being arranged more compactly than is possible when they are constructed and arranged in the ordinary manner.

BINDING ATTACHMENT FOR REAPERS.—Joseph K. Bull, Buckingham, Iowa.—This invention has for its object to furnish an improved attachment for reapers to facilitate the binding of the grain, and at the same time to enable the bundles to be deposited upon the ground in groups of six or more.

WAGON BRAKES.—Hugh Davidson, New Salem, Ill.—This invention has for its object to furnish an improved automatic brake which shall be so constructed as to adjust itself properly to all positions of the wagon, which can be cheaply and easily made by any blacksmith, which shall be more durable than other brakes now in general use, and which shall be capable of being applied to any wagon.

CHALK AND SANDPAPER HOLDER.—Charles F. Ritchel, Chicago, Ill.—This invention has for its object to furnish a neat, simple, and convenient chalk and sandpaper holder for billiard cues, which shall be so constructed and arranged as to be easily carried in the pocket so as to be ready for use at any time.

CORSETS.—Mrs. Emilie J. Meriman, New York city.—The main object of the present improvements in corsets is to so construct the same as to relieve the hips of the wearer, from the great weight of the clothing which with the use of the ordinary corsets bears thereon, and transferring it to the shoulders in such a manner as to cause no feeling of uneasiness, and to allow the greatest possible amount of freedom of movement to the waist or body.

TELEGRAPH INSTRUMENT.—Robert K. Boyle, New York city.—This invention relates to a new telegraphic printing apparatus, which is so arranged that it will adapt itself to every variation of the weather, and that it will utilize the whole power of the current. The invention consists, first, in a new arrangement of connecting the magnet with the electro magnets. In this apparatus four electro magnets are employed, a pair being arranged on each side of the horseshoe magnet. The two electro magnets on each side are arranged one above the other. Two horseshoe magnets are firmly secured to an oscillating horizontal bar, in such a manner that each end of each horseshoe is between the two opposite face plates of two opposite electro magnets. By means of this arrangement the through current, which is generally obtained, is avoided, and the horseshoe magnet will more easily change its position when the polarity of the electro magnets is reversed.

GAS MACHINE.—Hiram S. Maxim, New York city.—This invention relates to a new gas machine which is so arranged that the production of gas will be entirely automatically regulated, and that the volume of gas as well as its pressure, is under automatic control. The invention consists in the arrangement of the various devices for regulating the pressure of the evaporated gas, for regulating the quantity of illuminating gas made, and for regulating the supply of air to the machine.

REGULATING WATCHES.—Frank G. Johnson, Port Richmond, Staten Island, N. Y.—This invention relates to an improvement in watches, whereby the regulating hand of the watch is so operated that it may be adjusted with the greatest nicety, and the invention consists in fixing a fine thread screw in the watch, with a movable grooved nut thereon, which nut, as it is turned on the screw, moves the regulating hand.

COMBINED SPUR AND CREEPER.—Ferdinand Mehrmann, Fountain City, Wis.—This invention consists in providing to the sides of an ordinary or suitable spur, a bow-shaped bar or plate with teeth on one side; said plate or bar can be either turned forward under the sole of the boot or shoe, to be used as a creeper, or it can be folded back over the heel, where it will be out of the way, the whole instrument being then only a spur. By means of a suitable fastening device, the bow can be locked to the spur in either position.

MEAT CHOPPER.—Thomas Payne, Grand Rapids, Mich.—This invention has for its object to furnish a simple, convenient, and effective machine for chopping sausage meat and other substances, which shall be so constructed and arranged that the chopping box may be revolved automatically, with a slow and steady movement, bringing a new part of the substance to be chopped beneath the knives at each stroke.

SERVICE PIPE FOR WATER OR GAS.—Edward Hagan, New York city.—The object of this invention is to protect water or gas pipes from freezing up, and to provide a ready means of withdrawing and repairing such pipes when the same require inspection, cleaning out, or repair without the necessity of digging up the whole length of ground pipe from the main, thus avoiding delay, inconvenience and great expense.

LADDER FOR LAMP-LIGHTERS.—M. M. Smith, Nashville, Tenn.—The object of this invention is to provide a simple, portable, and effective step ladder for the use of lamp-lighters.

FANNING MILL.—H. A. Snyder, Shullsburg, Wis.—The object of this invention is to provide a governor for fanning mills, which acts automatically to prevent the grain from being blown over the sieves when the fans are driven with very high velocity, or to so adapt itself to a low velocity that the grain will be perfectly cleaned in that case. It consists of a hinged board forming part of the box or cylinder, the said board being suitably connected with the gates which admit air to the box, that the movement of the said gates to shut off the excess of air to the box is dependent upon the movement of the hinged board, which latter is itself actuated to movement by the antagonistic forces of a spring and the current of air developed by the fan wheel When the force of the current of air exceeds that of the spring, the board raises, and being connected with the gates, actuate them to shut off a portion of the entering air, but when the force of the spring is in excess, the board tends to approach the outer ends of the fans, and in so doing moves the gates to admit a greater supply of air.

COFFEE MILL.—Wm. H. Barns, New London, Conn.—This invention consists in placing a coiled spring around the arbor of the rotating grinding plate or runner, so-called, of a coffee mill or such other analogous grinding mills as are susceptible of and are improved by the application of the coiled spring as above mentioned.

CHURN.—C. M. Lightner, Harrisburgh, Pa.—This invention consists in a cubical or oblong box, by means of suitable trimmers affixed to any two diagonally opposite corners of the said box, and providing the box with an internal dasher or revolving frame, which is actuated by suitable mechanism to revolve in a contrary direction to the box, and thus produce a thorough agitation of the milk, whereby butter will be formed in short time.

PIANO HAMMER.—C. W. Brewer, Racine, Wis.—The object of this invention is to obviate the so called bell tones which result when the lower octaves of a square piano are struck with force. The invention consists of a soft rubber tube, or volute, inserted in the felt portion of the modern felt and buckskin hammer head, and by this composite is produced the proper elastic action of the whole head.

STUMP EXTRACTOR AND REMOVER.—C. C. Manuel, North Troy, Vt.—The object of this invention is to provide a machine for extracting or removing stumps, large stones, and other ponderous articles. It consists in a strongly braced frame raised by uprights to a suitable hight above the axle trees of a stout running gear or wagon, and provided with mechanism for extracting stumps or lifting from the ground any ponderous bodies, as large stones, logs, and the like.

APPARATUS FOR DRAWING OFF STARCH.—Colgate Gilbert, Buffalo, N. Y.—This invention relates to a new and improved method of constructing apparatus for drawing off starch and other substances held in solution or suspension in water, whereby the separation of the starch or other substance from the impurities is effected automatically and perfectly.

BELTING, ETC.—Thomas Standring, Port Richmond, N. Y.—This invention relates to a new and improved method of constructing belting, or traces, or other straps now made of leather only, or of any one material, whereby the strength of the same is greatly increased.

PESSARY.—W. F. Chrisman, Trenton, Tenn.—This invention consists of an elastic airvessel composed of a combination of textile fabric and india-rubber, the layer of india-rubber being interposed between the textile material thus uniting the two layers of the latter. It consists also of the form given to the instrument together with a stop cock attachment therefor which latter is employed in inflating the same when in the vagina.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

R. S., of Mich.—Pozzolana is brought from Pozzuoli, near Naples, and consists of volcanic ashes, concreted into a cellular mass of a baked appearance and rusty color. When a proper proportion of it is made into mortar with lime and sand, it sets speedily under water, making one of the best water cements known.

R. L., of N. H.—To make a fine red lake, take coarsely powdered cochineal 1 oz., water and rectified alcohol each 2 oz., digest for a week, filter, precipitate with a solution of tin added every two hours until the color is all thrown down; wash with distilled water and dry. It will not pay you to make it on a small scale.

J. L. S., of Ohio.—A good whitewash for out door work is made by adding to ordinary lime whitewash two ounces of glue, well dissolved, to a gallon of the wash, and also one half a pound of whiting.

J. O. B., of N. Y.—The incense burned in Catholic Churches, is gum olibanum. It is best pure, but is frequently adulterated with turpentine.

G. W. F., of Mass.—Are hydraulic presses ever used for raising buildings? If so how is the power applied? Could the power of two men at the pump be sufficient to raise a large building? Ans. They are. The power may be any motive power used for any other purpose. The power upon the pump necessary to raise any given weight, depends upon the relative area of the pistons. Theoretically a press might be constructed so that a mouse could raise one of the Egyptian Pyramids.

G. L. M., of N. Y., writes us in regard to crank-engines. he thinks he differs from us in our views expressed on page 121 of the present volume, the fact is we are perfectly agreed. The difference is simply in the construction of terms. We used the term applied, in its philosophical sense, i. e. used to produce an effect. Mr M. will admit doubtless that the full application of steam to the production of motion is only made through a portion of the stroke in a crank engine. The admission of steam into the cylinder when the crank is in the dead center, would not be the application of steam to the production of motion because in that position no motion can be obtained. The words admit and apply are not synonymous.

C. M. B., of N. Y.—The subject of your letter, the use of compressed air as a motor and the utilization of water falls for that purpose, you will find treated in this issue under the head of "Transmission of Hydraulic Power." We shall write again on the same subject, as we deem it of great importance. The article also on page 179 current volume, entitled "Solar Heat," treats on a branch of the same subject.

H. E. L., of N. J.—This correspondent, referring to an article on paper on page 36, current volume, SCIENTIFIC AMERICAN, in which the okra plant is mentioned as a material for paper making, suggests "Bagasse" or "bergasse," the crushed sugar cane, as a possible useful substitute for rags in the manufacture of paper. He says that it may be obtained in almost unlimited quantities on sugar plantations, where the only use it is put to is as a fuel. The outer shell of the cane is similar to straw which has not yet proved to be a competent substitute for rags. The pith, we think, lacks the fibrous quality requisite for conversion into paper. We believe the address of the Okra Paper Company is 48 Pine street, New York city.

J. S., of Mass.—We know of no better varnish for loom harnesses than that made according to the following recipe, used by an overseer of cotton weaving of more than thirty years' experience: 2 gallons linseed oil; 2½ lbs. gum shellac; 2 lbs. litharge; 1 lb. red lead; 1½ lbs. umber, ½ lb. sugar of lead.

P. J., of Minn.—Why does not the gas in a pipe burn when it is lighted at the orifice?" Such a question is puerile. Hydrogen gas—the common "illuminating" gas—is not inflammable. It requires oxygen to produce and sustain combustion, and that is found in the atmosphere, which must be mixed with the hydrogen to produce a flame.

S. O. L., of Ohio.—Malachite is a native oxide of copper. The best specimens are found in Siberian copper mines. It is used for ornamentation as veneers generally, although now quite fashionable for brooches, ear drops, etc. Probably the finest native and wrought specimens in this country are those sent as presents to the late Gov. Thomas H. Seymour of Connecticut by the Emperor Nicholas of Russia.

T. of Malvern, Eng.—In the solution of the problem you send us you accept the velocity of the wave of sound as 2,000 feet per second, and the apparent velocity as 2,060 feet.—This is all wrong. The theoretical velocity uncorrected for temperature is 916 feet, corrected for temperature it is 1090 at the freezing point and one foot more for every degree above this; 1,109 feet at 42° Fah., 1,140 feet at 82° Fah., etc. Your calculation based on these erroneous premises is therefore incorrect. You ask, "Who hears the true pitch of the whistle of a moving locomotive." Of course those who remain at the same distance from the sounding body, viz., the people on board the train, and those at a great distance at right angles to the direction of its motion; those whom the train approaches hear it sharper, those from whom the train departs, flatter than it really is.

F. M. B., of Ky.—The ink stains in the piece of goods you send us are to a considerable extent removable by pure water, without changing the original color. For what remains of the stains use, carefully, oxalic acid. The red color produced by the acid in the original dye can be restored by ammonia.

R. S. T., of Ala.—Kalsomine is composed of zinc white mixed with water and the sizing of glue. The surface to which it is applied must be clean and smooth. For ceilings mix half a pound of glue with fifteen pounds of zinc; for walls a pound of glue, with fifteen pounds of zinc. The glue, the night before its use, should be soaked in water and in the morning liquefied on a fire. It is difficult to prepare or apply kalsomine; few painters can do so successfully. Paris white is often made use of for it, but it is not the genuine article.

P. O. A., of Minn.—To make fire-proof mortar, take two-thirds of the best lime and one third of smith's black dust, and mix with the necessary quantity of water. The will form a mortar that will set nearly as hard as iron, and is the best to use for setting the firebricks in or about fire places.

S. M., of N. J.,—A printer's error vitiated our answer to your query last week instead of being, the superheating surface in marine engines is too *small* it should have been too *large*.

S. O. O., of Mass.—We can highly recommend the following recipe for paste for polishing furniture: Three ounces of white wax, half ounce of Castile soap, one gill of turpentine. Shave the wax and soap very fine, and put the wax to the turpentine; let it stand twenty-four hours; then boil the soap in one gill of water, and add to the wax and turpentine.

Business and Personal.

The charge for insertion under this head is one dollar a line.

NEW PUBLICATIONS.

THE THREE VOICES. By Warren S. Barlow. Boston: Wm. White & Co., publishers.

The author of this volume is not well known to literary fame; nevertheless he has produced a poem of 181 pages, which has the merit of a rhythmical composition classified under three headings—The Voice of Superstition, The Voice of Nature, The Voice of a Pebble—and partakes of the nature of a criticism upon things held sacred, and is not exactly orthodox in its theology. We have never considered it profitable to read skeptical works, for at best our ideas of the Christian faith are too loosely regarded, as a general rule.

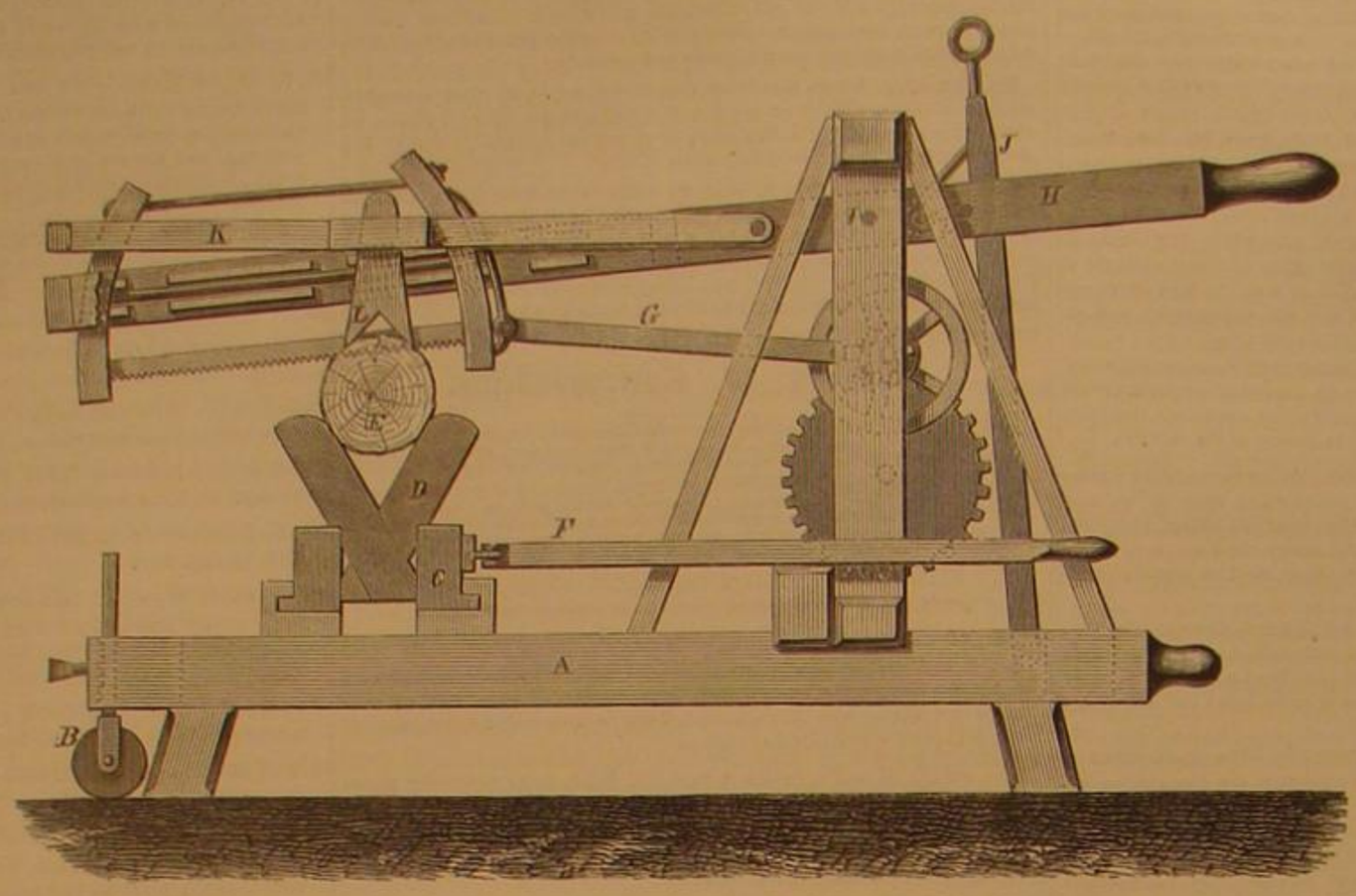
PERSONAL HISTORY OF ULYSSES S. GRANT. By Albert D. Richardson.

We have received a copy of the above work of 560 pages from the American Publishing Company, of Hartford, Conn. Mr. Richardson is a very graphic and careful writer, and in his new volume he has grouped together a great variety of incidents in the life of the illustrious subject, which will be read with interest long after the heat and prejudice of party warfare has passed away.

Improvement in the Application of the Common Buck Saw.

The engraving presents a view of a machine designed to take the place of the ordinary buck saw and horse, and applicable also to other purposes. The bed frame, A, is supported on legs and has at one end an adjustable truck, B, which may be lowered when the machine is to be moved from place to place, and act as the wheel to a barrow; the machine being propelled by means of the handles at the other end of the frame. Fixed to this bed is a transverse frame, C, extending beyond the sides of the bed, and carrying a sliding horse, D, for receiving the log, E, the horse being moved back and forth by means of the lever, F. Rising from the bed is an upright frame supporting two shafts; the lower one carrying a gear and having on one end a crank by which it may be turned, and the upper one having a pinion meshing into the gear and a fly wheel with crank attached. This crank is connected with the saw by a bar or pitman, G, the saw moving in slides on a frame, H, pivoted to the upright at I. The weight of this frame aids in the action of the saw. When the log, E, is to be moved for taking another cut, the lever, J, having a hook attached, engaging with a pin on the frame, H, is used to support the frame. On the frame, H, is pivoted another frame, K, carrying struts, L, for grasping the log, to prevent its rolling while being sawed.

From this description the operation of the machine will be readily understood.



NOEL'S PATENT SAWING MACHINE.

Patented through the Scientific American Patent Agency, Aug. 25, 1868, by M. P. Noel, whom address for further particulars at St. Cloud, Stearns Co., Minn.

Device for Feeding Cattle on Growing Crops.

It is sometimes very desirable to feed crops while growing, thereby saving the labor of cutting and gathering, but if stock is turned into a field loosely, without control or guide, a large portion of the crop is destroyed by trampling. Beside this, the straying of the cattle and the trouble of collecting them when needed, are serious annoyances, demanding some device for controlling the animals while allowing them sufficient freedom for grazing or cropping. Sometimes, also, it is desirable to confine the cattle to a certain space or portion of the field, and the common method of securing the animal to a tether fastened to a stake, however feasible on grass land, is very destructive in growing corn, millet, etc.

The device shown in the accompanying engraving prevents all these annoyances and enables the farmer to govern his stock. As will be seen, the contrivance is very simple; a rope stretched between trestles, one end of the line fastened to a stake driven into the ground or to any fixture, and the other end secured to a simple windlass by which the line is made taut. The tension of the line holds the trestles at either end in an upright position without the necessity of sinking their feet into the ground. On the line, at such intervals as are required to govern the range of the animals, are snugs fastened with set screws. The animals are secured to the rope by tethers, one end of which is attached to the stretched line by a snap loop or a ring, and the other end to the neck, horns, or nose of the animal, in the latter case a snap ring engaging with the cartilage of the nose. If necessary, guide cords may be attached to the ring and the horns of the animal, as seen in the figure of the bull, to afford comfort to the animal while feeding.

For herding cattle, mules, sheep, or swine, facility of leading them to water, preventing hampering, and giving entire control over them, this device is evidently valuable. With its use much of the trouble and expense of fencing will be avoided, and stock may be grazed or fed on open commons, or in fields of growing crops, without danger or annoyance. We cordially commend this simple contrivance to the attention of our agricultural readers. It was patented by Jesse Wilkinson, June 2, 1860, who, if addressed at Champaign, Champaign Co., Ill., will give any further information desired.

WILKINSON'S PATENT CATTLE HERDER.

PROPELLING BOATS ON CANALS.

From a correspondent we have received copies of articles published in Rochester (N. Y.) papers, relative to the performances of a canal boat named the *Edward Backus*, from its builder, or rather the inventor of a new method of propelling boats, which it seems from published reports has been tried with at least present success. Instead of a side-wheel boat or an ordinary propeller, or, indeed, any boat propelled by paddles acting on the water, this is a sub-aqueous traction machine, finding its means of propulsion on the bed of the canal and by its traction wheel. We cannot do better, without diagrams or other engraved illustrations, than to copy the following attempted description from the Rochester *Daily Democrat*:

"A ten horse-power boiler and double engines are placed amidships; and by these are driven an eight-feet traction wheel, which runs in what is called a 'well,' the bottom of which is the bottom of the canal. This wheel has a facing of iron, through the center of which runs a chain acting upon it like a belt upon a pulley. This chain passes around a smaller wheel on the main shaft. On the surface of the wheel are spurs or clogs projecting about four inches from its surface and about four inches in width, and these with every revolution of the wheel, digging into the bottom of the canal, force the boat through the water. By means of a contrivance attached to the wheel, it rises and falls as the inequalities on the bottom of the canal may demand. In addition to the wheel, a four-feet propeller is also in the boat, to be used when she is required to go into deep water."

The statement does not give the amount of the rise and fall that may be imparted to the wheel to meet the inequalities of the bottom of the canal. Probably it is not much; for we are told that a propeller is used for deep water. The Rochester *Union and Advertiser* says that a propeller wheel at the stern "may be lowered in a moment to its place." One would be apt to inquire whether it would be necessary to grade the bottoms of canals as we do the level of railways or common roads, in order that this contrivance should work, and if so, whether the action of the spur wheel would not soon change the level by continually stirring up the sand and mud. The varying nature of the bed—mud, sand, gravel, etc.—and the inequalities of its surface—alternate hills and hollows—would seem to suggest that fully as much reliance should be placed on the propeller at the stern as on the amidships traction wheel. The Rochester *Democrat* says: "With two hundred tuns of coal the boat moved along at the rate of two miles an hour." This rate hardly proves the superiority of this mode of propulsion over that of horses on the score of speed. We would gladly chronicle any successful effort at improving the speed of canal navigation, but we do not recognize it in the description before us of the traction wheel boat. Still, as we before hinted, diagrams or drawings might change the complexion of the case.

Progress in Science---Something to Think About.

At the close of the ceremony of "capping" the medical graduates of the University of Edinburgh, Sir James Y. Simpson, one of the most celebrated physicians of Europe, delivered an address, in the course of which he said:

"A most extensive field for new investigations lies temptingly open for the young and ambitious physician in the almost innumerable series of new chemical compounds which modern organic chemistry has evolved. Among this world of new compounds will probably be yet detected therapeutic agents more direct, more swift, and yet more sure in their action than any which our present pharmacopeias can boast of. It may be, also, that the day will yet come when our patients will be asked to breathe or inspire most of their drugs instead of swallowing them; or at least when they will be changed into pleasant beverages instead of disgusting drafts and powders, boluses and pills. But that day of revolution will not probably be fully realized until those distant days when physicians—a century or two hence—shall be familiar with the chemistry of most diseases; when they shall know the exact organic poisons that produce them, with all their exact antidotes and eliminatories; when they shall look upon the cure of some maladies as simply a series of chemical problems and formulas; when they shall melt down all calculi, necrosed bones, etc., chemically, and not remove them by surgical operations; when the bleeding in amputations and other wounds shall be stemmed, not by septic ligatures or stupid needles, but by the simple application of hemastatic gases or washes; when the few wounds then required in surgery shall be swiftly and immediately healed by the first intention; when medical men shall be able to stay the ravages of tubercle, blot out fevers and inflammations, avert and melt down morbid growths, cure cancer, destroy all morbific organic germs and ferments, annul the deadly influences of malaria and contagions, and by these and various other means markedly lengthen out the average duration of human life; when our hygienic condition and laws shall have been changed by State legislation, so as to forbid all communicable diseases from being communicated, and remove all causes of sickness that are removable; when the rapidly increasing length of human life shall begin to fulfill that ancient prophecy, 'the child shall die an hundred years old;' when there shall have been achieved, too, advances in other walks of life far beyond our present state of progress; when houses shall be built and many other kinds of work performed by machinery, and not by human hands alone; when the crops in these islands shall be increased five or ten fold, and abundance of human food be provided for our increased population by our fields being irrigated by that organic waste refuse of our towns which we now recklessly run off into our rivers and seas; when man shall have invented means of calling down rain at will; when he shall have gained cheaper and better motive powers than steam; when he shall travel from continent to continent by submarine railways, or by flying and ballooning through the air; and when—to venture on only one illustration more—tiresome graduation addresses shall no longer require to be written by old professors nor listened to by young physicians."

PATENTS.—If success is the test of merit, we invite inventors to consider the fact that of the list of patents published in our last number, SEVENTY-FIVE were solicited through the Scientific American Patent Agency. The Patent Office, under the management of Commissioner Foote, is getting into fine working order, and applications will be more promptly examined and disposed of than heretofore. Inventors who desire advice and assistance in procuring their patents can receive our Pamphlet of Instructions and correspond with us freely.

AT Granby, Mass., in the yard at the residence formerly owned by the late Rev. Elijah Gridley, there is a fine elm tree of a century's growth. Upon the side of this tree, twelve feet from the ground, is a currant bush rooted in the bark which has thrived and produced its annual crop for years.

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VOL. XIX., No. 13...[NEW SERIES.]....*Twenty-third Year.*

NEW YORK, WEDNESDAY, SEPTEMBER 23, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

MECHANICAL SKILL NOT ALWAYS ARTISTICAL TASTE.

We have frequently spoken of the value of the mechanical skill gained by close attention to, and constant practice in different branches of the mechanical arts, especially those in which manual labor enters largely as an element; and its value cannot be over-estimated. The skill that constitutes the value of a workman can be obtained only by close application and constant practice. Such skill is the workman's capital. With it he can command, if not control the market. He can make his own terms, if not ruinously exorbitant in his demands. In almost any condition of business he can secure a good position, while loud-mouthed and conceited pretenders are "sent to Coventry." The world needs—the mechanical world demands—skilled labor, the skill that springs from an innate inclination for the business, and is obtained by close practice, and, possibly, long experience.

These remarks do not apply only to manual mechanics, but also to employments only partly mechanical in their operation; for the mind or the "groove of thought" in which it moves, is also to be educated by practice, and made subjective by experience before success is thoroughly assured. Even the entry or copying clerk, the freight agent, etc., can make himself almost indispensable to his employer by a close attention to the details of his business, and a perfect familiarity with its forms.

In this office (the patent department) we have some men who, on a mere glance at a model or drawing, form an idea, generally correct, as to its value—its patentable worth. On a further examination they give an opinion, which is not often at fault. The experience of many years—their thoughts always directed in the same channel—makes them experts. Their advice is valuable, and not unfrequently our customers receive ideas and suggestions from this source which prove to be of great assistance to them. Long experience, good judgment, educated discrimination, and the mental skill dependent on experience and practice, combine to produce this result.

But there is a perfection of skill which no mere practice can give. It is the skill of taste—the instinct, if so it may be called, that comprehends the "eternal fitness of things"—that pushes rather than leads its possessor to marked excellence. It is a natural aptness for his chosen profession, a love for its details as well as an instinctive grasping of its principles. Perhaps all are not blessed with this natural fitness for their business; many round pegs try to fit square holes. Possibly it is not easy, always, to ascertain one's peculiar bent; and, possibly, some have no peculiar taste for any particular calling. Sometimes such are so versatile that they can succeed in anything they undertake; we have known such. Yet the taste that makes a Doré in art, a Roebling in engineering, a Smith in mechanics, is a fortune to its possessor, and a benefit to the world.

Our pages not unfrequently exhibit evidences of this natural skill of taste. Everyone who has compared the illustrations in the SCIENTIFIC AMERICAN, with those in other native or foreign illustrated publications, must have noticed the excellence of our engravings. An instance appears in our last issue, where a plain photograph of a simple animal trap, as it appeared on the table of the photographist, becomes a picture, full of expression, and very suggestive. See, in the faces of the rats, and even in their attitudes, the almost human expressions of curiosity, contemplation, resolution, and, finally, despair. These representations of mental exercise and emotion, and the *character* given to our illustrations generally, are due to the taste and skill of our artists, Mr. Louis Seitz, and Mr. Henry E. Mead, and the careful manipulation of our engraver, Mr. Richard Ten Eyck, who are unexcelled in their specialties in this or other countries. Such skill rises to the hight of real genius.

We make no apology for selecting the works of our artists and engravers to illustrate the text of this article. The position of this journal does not need the perpetual blowing of our own trumpet, nor a continual reproduction of the commendations of others; else we might fill columns weekly with notices of the most favorable character. Still, it is not improper that we should refer to our corps of artists and engravers with a degree of pride, in view of the superiority of their productions. We propose, always, to employ the best procurable talent in every department. Our past success and present status prove that our discrimination between mere manual skill and natural talent is wisdom in its highest, its successful sense.

These illustrations, conveniently drawn from our daily surroundings, serve to show, in a degree, the advantage of natural bent over mere practical skill without the taste necessary to guide. In one case (the latter) perfection is attained only by continuous practice; in the other the taste of the workman eliminates crudities, perfects suggestions, and makes a merely mechanical task a labor of love. While machines, human and mechanical, can follow a plainly marked path, it is only the judgment, the instinct, the genius of the artist, in the truest sense of the term, that can make the dry bones of mechanical practice assume muscle, flesh, form, and become living representations of living ideas. Mechanical skill and constant practice can represent, either by writing, drawing, or painting, a dog, in his outlines and profile; but it requires artististic taste to reproduce the original so as to project an image of the dog on the retina of the natural eye, and at the same time convey to the mind the characteristics of the animal itself. If this is true in the representations of natural objects, appealing mainly to the eye, it is no less true of the images which appeal to the mental vision. Ideas conveyed by words alone may be either skeletons, or, perhaps, statues, or may be made living, breathing existences; one of these is the result of the skill obtained by persistent practice, and the other the skill or finish belonging only to natural taste, inclination, or genius.

PRETENTIOUS TEACHERS.

If it were not amusing it would be disgusting to witness the airs assumed by some who pretend to teach us how to preserve our health. Is there any fruit, vegetable, or meat, or drink, particularly pleasant to the palate and satisfying to the stomach, these teachers discover in it not only the seeds of death, but a fatal if not a rapid poison. Knowing something of the wants, needs, weaknesses, and frailties of "poor human nature," from our own experience, we always doubt the sincerity of those teachers who would make all men and women mere machines, to eat, drink, sleep, bathe, and dress by one rule and system. They construct a Procrustean bed for others to lie upon, but we doubt if they ever stretch their own limbs upon it. Their "best holt" is in running a tilt against everything for the stomach or palate that is tasty, nice, and gratifying. Condiments that give piquancy to otherwise tasteless dishes are their especial abhorrence.

With all proper deference to these learned teachers who preface their names with Prof., or tail them with M. D., we believe what we know—what experience has taught us—rather than accept their *ex cathedra* opinions. We believe that lemonade with sugar is better every way than without; that soda water is not unhealthful. Shall we discard sugar, and the effervescing water charged with carbonic acid gas, because somebody, assuming to teach, says these are unhealthy? Even "pure and sparkling water," drawn from nature's own fountain, the drink prepared for man by his Creator, not unfrequently holds a portion of this gas, and it is found in every sort of drink that has any "snap" to it; in in cider, root, or spruce beer, mineral waters, sparkling wines, etc.

If onions are distasteful to some persons, should others not eat them? A lover of this delicious vegetable may deny himself the pleasure of eating them from a desire not to offend the fastidious olfactories of those with whom he comes in contact; but it is not necessary to insult his common sense by telling him they are acrid and difficult of digestion; for perhaps his experience of twenty years proves the contrary.

The cholera seasons of '53–4–5 were hard on cucumber growers and eaters. Hundreds seemed to believe that almost certain death lurked within the rind of the deliciously cooling vegetable, and it was not found upon their tables. Cucumber and cholera were synonymous or convertible terms. Yet we have had this grateful vegetable on our table for parents and children to freely eat, and have always, since our earliest remembrance, eaten freely of fresh cucumbers, morning, noon, and—night, without even inconvenience, not to mention cholera or colic. This much abused vegetable is a staple article of food to the fellahs of Egypt in its season; indeed, for months they eat scarce anything else. It is as much a necessity to them as the watermelon to the negroes of the South. Yet our health teachers think cucumbers are barely allowable for healthy stomachs, and advise their elaborate preparation for the table, ending the recipe by the exceedingly witty *finale*, "throw them out of the window."

Reason would seem to teach that the sense of taste, so delightful to gratify, was given by our Creator for our pleasure; yet the main aim of our health teachers seems to be utility—ascertaining what sort of food is the cheapest—and they compile long tables of chemical statistics to prove that a peck of beans is better than a quarter of beef, that oatmeal porridge is to be preferred to a saddle of mutton; that poultry is vanity, and potatoes a costly luxury.

Children need to be guided in choice and quantity of food, and in the proper care of their persons; but if one has arrived at manhood or womanhood, without having ascertained what he should eat and drink, and what he should refrain from, there is little hope of his improving by the advice of others. What is sauce for the goose is *not* always sauce for the gander. There are individual differences in natural constitution, habits, etc., that render abortive any attempt to dictate strict rules universally applicable. Peter received a lesson (*vide* Acts, chap. x.,) which our health teachers would do well to heed. There is a great deal of force in the advice given by an old Scotch divine. He told his people, "that if they wished to enjoy religion, they must fear God, and keep their bowels open."

ARE THE DIRECT RAYS OF THE SUN HEALTHY?

Much is said about the healthful influence of the sun's rays, his heat and light, and we are advised to admit this heat and light into our houses; all of which we heartily approve. The sun is the great source of health as well as of heat, and his rays undoubtedly produce a beneficial effect upon all organisms, animal and vegetable. But it may he questioned whether the direct influence of the sun is healthful. The Sepoy campaign in India severely tested the endurance of native as well as English troops, and it was found necessary to adopt coverings of white cotton or linen for the men's caps, which, from the general use of them in Havelock's army, got their name from him, and in the early stages of our recent civil war the havelock was considered a necessary part of a soldier's fit-out. The great objection to their use was the curtain, which covering the ear, prevented the ready hearing of an order. Especially was this noticeable on a parade when the execution of an order delivered by the adjutant or the colonel of a regiment would be delayed until it could be passed from company to company in the regiment. We discarded the havelock and substituted the dampened towel, or a wisp of grass, or a handful of green leaves worn in the cap. All this simply to guard against the direct force of the sun's rays.

In New York City—in every city and town—this summer and that of 1866, men dropped fainting and sometimes dead from direct solar influence. Sunstroke the last season was a most prolific cause of death, and temporary, if not permanent, insanity. It required the coolest state of the blood, the quietest condition of the emotions, and the least bodily exertion to bear up against the injurious influences of the sun. People shunned the street and hived in their dwellings, offices, and stores to escape the evil influence, which was not only a threat and warning, but a destroyer, seldom giving the warning.

Our experience and the experience of others seems to show that sea sickness is more prevalent in the summer—on sunshiny days—than in cold weather or on cloudy days. Persons exposed in an open boat, as fishing parties, become sick and experience nausea, when those on a large vessel, where the passengers can shelter themselves from the sun's rays, may not feel the slightest inconvenience. All of this cannot be justly attributed to the tossing of the smaller vessel, as not unfrequently the rolling of a large ship is more trying to the landsman's stomach than the uneasy and erratic pitching of a small boat. In neither case do broad brimmed hats and bonnets protect from either glare or heat of the sun's rays, as the moving ocean is a mirror with a thousand concave lens, conveying the rays to *foci*, intensifying the light and heat, and, in spite of sheltering hat brims, throwing the glare and glancing the heat from the surface of the water.

Protection against the enervating effect of the sun's rays, is best afforded by the turban, which the Orientals have used for centuries—it being, in fact, the oldest headdress known—and seldom do these children of the sunny East experience the torments or meet the fatality of our two well known *coup de soliel*.

MANUFACTURE OF PLUGS AND BUNGS.

A few weeks ago, on a trip to Lowell, Massachusetts, we visited the plug and bung manufactory of A. Bachelder, and witnessed the operation of an automatic machine for turning plugs and bungs. By the old style a series of cylindrical saws, corresponding in their interior diameter with the required diameter of the bung, were used, or a series of knives fixed to a cylinder, but they were difficult and expensive to make, and troublesome to keep in order; beside, they did not furnish a finished article. The one in use at this establishment has a cylindrical saw set at an angle to the ways of the machine, and on the other side is an automatic cutter, like a turning chisel or plane-bit, for finishing the plug. The pieces to be turned are sawed off squared sticks, the diameter of the stick corresponding with the required diameter of the plug, and the pieces cut to the right length. These blocks are fed into an upright hopper so proportioned as to deliver them properly at the bottom to two automatic, revolving centers, when they are brought under the action of the cylinder saw which cuts off the corners of the blocks and reduces them to a cylindrical form. Soon as this is done, and before the block is released, a sharp blade rises up and traverses the length of the block, producing a perfectly smooth surface and a slightly tapering form. The action of the parts is perfect and the rapidity of the production wonderful. A boy can tend a machine, the only labor necessary being to feed the sawed blocks, and that might be arranged to operate automatically. The preparation of the blocks is simply the sawing of the stock into strips and the cutting of them

to the proper length. These plugs are made of pine, spruce, oak, etc., for bungs for barrels for holding flour, oils, spirits, beer, molasses, tar, and as plugs for shipbuilding, for the use of inspectors, and many other purposes.

The Limit of Human Thought.

In No. 12 of the present volume we published an article entitled "Progress of Chemical Science," in which we endeavored to show that there is an ultimatum in physical science which the human mind can never reach. The following extract from the address of Prof. Tyndall to the British Association, in August, so strikingly confirms the views we expressed in the article referred to that we make room for it in our present issue :

In affirming that the growth of the body is mechanical, and that thought, as exercised by us, has its correlative in the physics of the brain, I think the position of the materialist is stated as far as that position is a tenable one I think the materialist will be able finally to maintain this position against all attacks ; but I do not think, as the human mind is at present constituted, that he can pass beyond it. I do not think he is entitled to say that his molecular groupings and his molecular motions explain everything. In reality they explain nothing The utmost he can affirm is the association of two classes of phenomena of whose real bond of union he is in absolute ignorance. The problem of the connection of body and soul is as insoluble in its modern form as it was in the pre-scientific ages. Phosphorus is known to enter the composition of the human brain, and a courageous writer has exclaimed, in his trenchant German, "*Ohne phosphor kein gedanke.*" That may or may not be the case : but even if we knew it to be the case, the knowledge would not lighten our darkness. On both sides of the zone here assigned to the materialist he is equally helpless. If you ask him whence is this "matter" of which we have been discoursing, who or what divided it into molecules, who or what impressed upon them this necessity of running into organic forms, he has no answer. Science also is mute in reply to these questions. But if the materialist is confounded, and science rendered dumb, who else is entitled to answer? To whom has the secret been revealed? Let us lower our heads and acknowledge our ignorance, one and all. Perhaps the mystery may resolve itself into knowledge at some future day. The process of things upon this earth has been one of amelioration. It is a long way from the Iguanodon and his contemporaries to the president and members of the British Association. And whether we regard the improvement from the scientific or from the theological point of view, as the result of progressive development, or as the result of successive exhibitions of creative energy, neither view entitles us to assume that man's present faculties end the series—that the process of amelioration stops at him. A time may therefore come when this ultra-scientific region by which we are now enfolded may offer itself to terrestrial, if not to human investigation. Two thirds of the rays emitted by the sun fail to arouse in the eye the sense of vision. The rays exist, but the visual organ requisite for their translation into light does not exist. And so from this region of darkness and mystery which surrounds us, rays may now be darting which require but the development of the proper intellectual organs to translate them into knowledge, as far surpassing ours, as ours does that of the wallowing reptiles which once held possession of this planet. Meanwhile the mystery is not without its uses. It certainly may be made a power in the human soul ; but it is a power which has feeling, not knowledge, for its base. It may be, and will be, and we hope is turned to account, both in steadying and strengthening the intellect, and in rescuing man from that littleness to which, in the struggle for existence or for precedence in the world, he is continually prone.

The Manufacture and Keeping of Cider.

The following extract from the "Wine-makers Manual," noticed in a previous number, will be of interest now that the season for cider-making is about to commence:

Cider is made by mashing and pressing ripe apples. A good eating apple is not necessarily a good cider apple, though there are good cider apples that are also good eating apples ; for instance, the Romanites, russets, etc. The best cider apple is the crab apple. As stated, the juice is transferred to barrels as soon as pressed, and there permitted to ferment. The fermentation does not come as quick as in grapes, and proceeds generally a little slower. The saccharine matter showing but thirteen degrees, and often less, much less alcohol is generated, and acetous formation is much more likely.

Pure cider is a cooling, slightly alcoholic, tartish beverage. It may be much improved by using five to ten pounds of starch sugar to fifteen gallons of juice, or, if that be unattainable, common sugar of the same weight, to each fifteen gallons of juice, before fermentation. The amount of sugar depends on the weight on the saccharometer. Cider that weighs thirteen, needs but five pounds ; that which weighs nine or less, needs ten or more.

Boiling one barrel down to half, and mixing it with another barrel, thus making one and a half barrels of juice, is also a very good method, and boiling all down so as to bring the "must" to twenty and more degrees on the saccharometer, is also to be recommended ; though I should think it handier for our households to condense one half to twenty-five, or even higher, density, and then pour it into the remainder. There are very few farms on which there may not be made six barrels of apple "must." By condensing three barrels into one, and pouring this condensed barrel of juice into the three other barrels of common cider, fermenting all in one cask, the farmer would secure four barrels, or one hundred and sixty gallons of excellent house wine, which would keep the whole year in the darker and cooler parts of most of our cellars. Care should be had to sulphurize the vacant part of the cask out of which the cider is being drawn off for house use. Better still would it be to draw it off, late in the spring, into about seven hundred bottles (involving a cost of about forty dollars for bottles), after it is fermented and has become clear. The receipt for making sweet cider with sulphite of lime, can be had at the druggists.

Editorial Summary.

The parade of the United Order of American Mechanics, took place at Lancaster, Pa., on the 11th inst.. and was a large civic demonstration, and altogether a very interesting occasion. About fifty councils from this State were represented and several from Delaware and New Jersey. Upward of five thousand men were in line. Some twenty large wagons were also in line, on which carpenters, bricklayers, saddlers, coopers, carriage-makers, boiler makers, house carpenters, printers, blacksmiths, and tinsmiths plied their profession. On one wagon were thirteen young women, dressed in white to represent the original thirteen States. In the center of these was a young woman personating the Goddess of Liberty. The wagon was drawn by thirteen gray horses. This was followed by General Washington on horseback, accompanied by a footman. A miniature steam fire-engine, electric telegraph, sewing machines, grain drills, and grain fans were also represented.

Detection of Nitro Glycerin.—To detect nitro glycerin in cases of poisoning, one should proceed in the following manner: The organic material to be tested is extracted with ether or chloroform, the extraction mixed on a watch glass with two or three drops of pure aniline, and evaporated upon the water bath. A few drops of concentrated sulphuric acid are then added, when, if nitro glycerin is present, a purple coloration appears which changes to a dark green on dilution with water. As little as ·001 grain of nitro glycerin may thus be identified.

The Astronomers in Luck.—Telegrams reporting the complete success of various expeditions sent to observe the recent total eclipse of the sun have been received. It is announced that the German expedition to Aden, in Arabia, is bringing six photographic views of the eclipse, while others announce the results of spectroscopic observations as being of the most remarkable character. We await with eagerness the full details of the observations.

We regret to announce the total destruction by fire of the extensive billiard table manufactory of Phelan & Collender, situated on Thirty seventh street. There were employed in the building some four hundred and ten men, who will thus be thrown out of work. The loss is not known, but with the three hundred finished tables, and four hundred more in process of construction in the building, it cannot, with these alone, be less than $175,000.

Australia is beginning to look after her manufacturing interests. A paper mill has been started at Melbourne, and it is announced with something of an air of triumph, that it makes paper good enough to print on! A woolen factory lately constructed at Geelong, sold $15 000 of goods at the first sale ; and the citizens were so pleased at the result, that ninety of them ordered a suit of the native cloth, for their own wear.

A few days since, while some persons were walking upon the side of the bluffs in the rear of La Crosse, a singular subterraneous sound was heard, which proved upon investigation, to proceed from a large underground stream of pure water running only three feet below the surface of the rocks, The stream is said to be ample for the supply of the city.

The upper portion of the bottom land along the Missouri river is stated to be covered with the sunflower, the result of seeds scattered by the Mormon emigrants. Although these seeds are known to contain a valuable oil, no one has as yet taken advantage of this large natural crop, and it is annually wasted.

English railroad companies may well be cautious in their management if such verdicts as the following are the rule. The family of a Mr. Howard, killed on the Great India Peninsula Railway, has been recently awarded damages amounting to $58,750. How would such verdicts suit our American railway companies?

Grant of Books from the British Government.—In virtue of a grant from the British Government, Cornell University, Ithaca, N. Y., is to receive a complete set of the British Patent Office publications, consisting of more than 2,300 volumes, and also such books as shall hereafter be printed in continuation of the set.

S. W. Bloom, of Bromstown, Ind., has made from common cornstalks, a sirup superior in flavor to sorghum, though there was a sorghum flavor discernible. The yield is nearly equal, per acre, to that of sorghum, and does not interfere with the production of green corn for market, from the same stalk.

It is reported that a new fire arm has been invented and exhibited at Königsburg, Prussia, having thirty-seven barrels. From 222 to 333 shots per minute can be made with it, and the balls carry 1,500 yards. It is used with a rest, and operated by one man, the recoil being taken up by a powerful spring.

An organ is now being built in London for Christ Church Camberwell, which is to have its keyboard placed fifty feet away from the body of the instrument. Instead of wooden trackers conducting wires will be used, and the instrument will be played by electrical agency, in the same way as a telegraphic machine may be worked by an operator at a distance.

The London *Lancet* says toothache can be cured by the following preparation of carbolic acid : To one drachm of collodion add two drachms of Calvert's carbolic acid. A gelatinous mass is precipitated, a small portion of which, inserted in the cavity of an aching tooth, invariably gives immediate relief.

It was proposed to give the Chinese an American watch, but as the Chinese day consists of only twelve hours, an ingenious Yankee has undertaken to manufacture a watch adapted to both the Chinese system and the one used in Europe and America.

A Detroit editor has invented an advertising bell to be attached to bulletin boards, walls, fences, and so forth, to attract attention to the advertisements pasted thereon. It is operated by a coiled spring with clockwork gearing, and when wound up and set running it will sound at intervals of a few seconds continuously for a week if desired.

A sensation was created at Niagara Falls recently. The main wires of the new suspension bridge have been thrown across the river. Two laborers walked the lower one from bank to bank, steadying themselves by the upper one, the wind meanwhile blowing furiously and swaying the wires in a frightful manner.

The fires in the forests on the upper Ottawa, and Gotineau rivers in Canada are the most disastrous that have occurred on this continent, the loss being already estimated by millions of dollars. Some plan ought to be adopted to prevent the criminal carelessness in which such fires generally have their origin.

It is rumored that a movement is on foot to unite the United States, England, and Russia in a grand expedition to solve the problem of the North Pole and its surroundings. Something of the kind ought to be done, in order to freeze off a few more adventurers.

Louis Napoleon is said to be mindful of the interests of his old friends. One of these, a bankrupt in 1850, has by the Emperor's aid amassed $20,000,000, while many others are said to have been placed on the track of large fortunes by his advice and assistance.

Any one who proposes to advertise in a paper has a right to know its circulation. The mere printing of a notice is of no value unless somebody reads it. The Scientific American has more readers than any other journal of its class in existence.

It is said that Mr Emerson considers the writing of twenty lines, completely finished and creditable to himself, a fair day's work. Some have thought that to read and understand twenty lines of his writings was a sufficient day's work for his readers.

The proper hight of turning tools on a lathe is a matter of importance to machinists. Many a job and many tools have been ruined by want of the knowledge in this respect gained only by experience.

It is said that velocipedes are to be adopted for the use of mail carriers in suburban districts, which it is estimated will enable them to complete their rounds four hours earlier and with less fatigue than is now the case.

The Museum of the Academy of Sciences in Philadelphia is now receiving eight large meteoric stones, weighing together 3,000 lbs., discovered in the Mexican mountains by Dr. H. B. Butcher, of that city.

A southerner proposes to supply the Boston market with paper stock made from the cane of the Florida cane brakes. He has invented a machine for reducing it to fiber which he affirms can be sold in Boston for two cents per pound.

Twisting or turning of belts is a poor makeshift when a straight belt refuses from slackness to perform its office. Better take up the belt and allow it to perform its proper office.

A Watchmaker of Paris has just completed a watch for the Sultan, valued at one million francs. There is a diamond at the back nearly as large as a walnut.

John Jenness, of Craftsbury, has in his possession a pair of oak cartwheels, made during the Revolutionary war, still quite sound and capable of service.

The circulation of the Scientific American was never greater than now. As an advertising medium it has no equal in its specialty.

The early frosts experienced in New England call to mind the severe frosts that occurred in August, 1816, by which the corn crop was nearly destroyed.

A western editor has adopted the plan of sending to subscribers long in arrears very damp papers, as a gentle hint that there is much *due* on them.

It is said that an innkeeper at Schaffhausen, on the Rhine, has suspended in a frame a board bill which the Emperor Louis Napoleon has owed him for thirty-nine years.

Platinized Mirrors.

The diathermanous, properties possessed by various substances are precisely analogous to those of transparency and translucency with which they are endowed, except that the former refer to rays of heat and the latter to those of light. Although in some degree the two descriptions of rays may be confounded, yet they are in reality separate, and the actinic rays of the sun are perfectly distinct from his luminous ones.

It might be supposed that the substance which showed great power of translucency would also evince similar capabilities with respect to diathermanancy, but experience has proved this assumption to be perfectly erroneous. If we select chloride of sodium in its crude condition, common crystal, and alum, they will be found nearly all equal in their power of transmitting light, but a wide discrepancy will be found in the manner in which they transmit heat. Their diathermanous capabilities are in the proportion of 9, 62, 93. It is quite possible to modify these proportions of bodies so as to produce quite contradictory and almost apparent paradoxical results. Thus a mirror can transmit light, and a perfectly translucent surface is capable, under certain conditions, of reflecting it. We really know the imponderable elements by their effects alone, and in spite of many learned surmises and ingenious theories of their origin and nature, we are as much in the dark as ever respecting their true cause and character. The effect of platinum upon glass, and the modification it produces upon its optical properties, has been turned to account by M Dodé some time ago. He takes an ordinary plate of glass, and by a chemically mechanical operation coats it upon one side with an almost infinitely thin layer of platinum. By this plan he obtains a mirror with direct reflection, and which may also, curiously enough, be employed as a common window pane by turning the coated surface outside. A slight tinge is imparted to the objects beheld through this medium, but otherwise the vision is clear, and the outlines of the objects well defined.

As all rays of light and heat must be disposed of by reflection, absorption, and transmission in different proportions, it is manifest that when a transmission and absorption accompanies a reflection, there is a loss incurred when the end in view is to bring into play the reflective powers only of the body. To prevent this, it is the practice to cover the non-platinized surface of the mirror with a slight coating of varnish. In this condition they are, of course, not translucent, but when they are intended to be manufactured in the form of kitchen and domestic utensils the varnish is omitted. They are, moreover, covered with a variety of designs, produced by corroding the surface of the glass and platinizing the engraved portions, which, therefore, are rendered alone transparent. Very beautiful and elaborate designs can be produced in this manner. One of the distinguishing features characterizing the light transmitted by glasses platinized in the manner described, is its peculiar softness and tone. M. Leroux was the first to notice this particular attribute of the light, and stated that it might be turned to good service in shielding the vision when engaged in regarding any intense source of heat, such as the sun, smelting, or gas furnaces When the natural sight is weak or temporarily deranged, these platinized glasses might be advantageously substituted for the tinted or colored ones usually employed, which are supposed to possess powers of neutralization that in reality rarely belong to them. They have already been replaced by the former in some astronomical instruments, to modify the intensity of the solar rays. All that is necessary is to place one of the glasses before the object-glass of the telescope, by which means a large proportion of the rays are reflected, and only a number pass through sufficient to enable the observer to study the aspect of the luminous body, without fatigue or annoyance to the eye. This property of subduing and softening rays of ardent light is not confined solely to platinized glass. The same effect is produced by the application of different metallic substances. If a pale blue glass be simply covered with a piece of gold leaf, the light transmitted is instantly endowed with a peculiar soft tone. A slight characteristic tint is also imparted to the light, which depends upon the nature of the metal employed. Thus, if pure gold be used, the tint is of a light greenish hue, while the ordinary or jeweler's gold, which always contains a certain proportion of silver, gives a bluish shade, varying in depth of color with the amount of alloy in the gold. The effect of thin sheets of metallic substances upon light has been known for a long period, and M Foucault has proposed to silver the object-glasses of telescopes employed solely for taking observations of the sun. He himself made the experiment upon the lens of a large telescope in the French Royal Observatory, and found that the image lost none of its clearness or sharpness, and the plan was greatly superior to the ordinary one of interposing a colored medium before the eye-glass of the instrument.—*Mechanics' Magazine.*

VARNISH FOR IRON WORK.—Dr. Lunge has published a method of making an excellent black varnish for iron work. he distills gas-tar until nearly all the volatile products are got rid of. He then stops the distillation and dissolves the residual pitch either in the heavier oils, or, if a very quickly drying varnish is required, in light oils or naphtha. This varnish is, of course, the original tar minus the ammonia, water, carbolic acid, and other things which give it its disagreeable odor, and make it so long in drying.

EFFECT OF FLANNEL ON THE SKIN.—Dr. Fox remarks that under the use of flannel, local heat is intensified, and itching often increased and kept up. He gives as a practical rule "whenever you have a congestive state of the skin, or any disposition to neurosis, take off the flannel and place it, if necessary, outside the linen, this will prevent any catching cold."

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office.

FOR THE WEEK ENDING SEPTEMBER 8, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

81,861.—GRAIN MOISTENER.—L. J. Adams and J. H. Esale, Avon, Ill.

We claim the combination of the steam pipe or pipes, F, perforated shield, G, and drip pipe or pipes, H, with the hopper, A, substantially as herein shown and described and for the purposes set forth.

81,862.—SAFETY ATTACHMENT FOR POCKETS OF APPAREL.—Alfred Arnemann, Guttenberg, Iowa.

I claim a pocket-book protector, consisting of the wire clasp, A, and of the plate, B, spring, c, hook, d, and knob, f, all arranged and operating substantially as herein shown and described.

81,863.—STEAM SAFETY VALVE.—E. H. Ashcroft, Boston, Mass.

I claim the arrangement of the projecting jacket, d, with the cross head, C, with reference to the valve and spring, substantially as herein shown and described.

81,864.—PORTFOLIO.—G. Ashworth and E. Ashworth, Manchester, England Patented in England, March 15, 1867.

We claim the spring clips or fasteners, d, constructed and applied to a portfolio substantially as described, in combination with a band or bands, c, of leather, or other suitable material, and which are adapted to staples or binders secured to sheets to be bound, substantially as specified.

81,865.—OPERATING SHUTTLE BOXES IN LOOMS.—John Ashworth (assignor to George L. Davis, John A. Wiley, and Joseph M. Stone), North Andover Mass.

I claim, 1st, The combination of the lever, E, with the two cam wheels, H and I, arranged with and acting on said lever, at different points in its length substantially as and for the purpose set forth

2d, The combination of the lever, E, the cam, H, and its hook rod or rods for operating the same, and the cam, I, and its hook rod or rods for operating the same, with the vibrating pawl or driver, N, and the levers P, and the pattern chain, and their accessories, for controlling the movements of the shuttle boxes substantially as described.

81,866.—WATER WHEEL.—Vincent M. Baker, Preston, Minn.

I claim the chutes, ix, in combination with the sliding gates, d, operated through the medium of the ring, H, and gearing, k l, all arranged substantially as and for the purpose set forth.

81,867.—STILL.—G. O. Baldwin, Hillsborough, Ohio.

I claim the slide, D, and condenser, E, constructed as described, when used in combination with the boiler, B, and steam pipe, C, substantially as and for the purposes herein set forth.

81,868.—APPARATUS FOR RECTIFYING SPIRITS.—W. G. Barcute, Canton, Md.

I claim the combination, with the still, A, of the cylinder, B, provided with the condensing chambers, D and E, refrigerator, F, and pipes, H and I, substantially as and for the purpose described.

The arrangement of the supply pipe, G, discharge pipes, K and M, the air tube, L, and refrigerator, F, substantially as and for the purpose described.

The receiver, O, provided with a pipe, P, communicating with the still, for returning the light wines, substantially as and for the purpose described.

The combination, with the cylinder, B, of the stop cock, R, tubes, S and worm, i, substantially as and for the purpose set for h.

81,869.—COFFEE MILL.—W. H Barns, New London, Conn.

I claim the combination and arrangement of the coiled spring, a, with the arbor of the runner, C, shell, D, and nut, b, all operating substantially as shown and described and for the purpose set forth.

81,870.—REGISTER FOR KNITTING MACHINES.—B. B. Bollinger, Louisville, Ohio.

I claim, 1st, The knitting machine register composed of a pattern wheel, E, a spring hammer, F, and an alarm bell, substantially as and for the purpose described.

2d, In registers for knitting machines, the combination of the alarm bell, hammer, and mechanism for moving the pattern wheel, substantially as here in described.

81,871.—PRINTING TELEGRAPH INSTRUMENT.—R. K. Boyle (assignor to himself and Giuseppe Taghabue), New York city.

I claim, 1st, Arranging a pair of electro magnets on each side of two horseshoe magnets, which are fastened to an oscillating shaft, substantially as herein shown and described, so that one pole of each horseshoe shall be attracted by but one electro-magnet, for the purpose specified.

2d, The application of the adjustable springs, d d', to the stationary part of the apparatus, said springs aiding to repel the horseshoe magnet, and to adjust the same in the center of forces, substantially as herein shown and described.

3d, The insulated sleeve, f, attached to the horseshoe magnet, in combination with the slotted pillar, g, and with the wires of the local magnet, all made and operating so that when the oscillations of the horseshoe magnet will cease, the connection of the wire of the local magnet will be completed, substantially as and for the purpose herein shown and described.

4th, Connecting the local magnet, F, by means of an escapement lever, j, with the friction wheel, H, substantially as and for the purpose herein shown and described.

5th, The lever, I, when connected with the sleeve, m, in combination with the friction wheel, H, and spring, p, all made and operating substantially as herein shown and described.

6th, The device, herein shown and described, for locking the bar, n, into the toothed disk, L, by the action of the horseshoe, and subsequently of the local magnet, said device consisting of the sleeve, m, lever, i, spring, p, and friction wheel, H, the latter having upright pins, l, and all made and operating substantially as and for the purpose herein shown and described.

7th, Connecting the friction wheel, H, with the escapement levers, j and M, all made and operating substantially as and for the purpose herein shown and described.

8 h, Connecting the sleeve, m, which is operated by the action of the local magnet, F, with the sleeve, i, which is moved by the action of the horseshoe magnets, E E', substantially as herein shown and described.

9th, The device herein shown and described for winding up the hair spring, x, by which the sleeve, i, is turned, said device consisting of the cam, u, arm, w, forked bar, v, arm, c', ratchet wheel, y, and block or pin, b', all made and operating substantially as herein shown and described.

10th, Combining the horse-shoe magnet and the local magnet in such a manner with the type-wheel shaft that, by the action of the horse-shoe magnet, it receives the required motion, while, by the action of the local magnet, it is instantaneously stopped in the desired position, substantially as shown and described.

11th, The arm, N, when secured to and projecting from the shaft, J, in combination with the arm, n, which projects from the revolving and sliding sleeve, m, and which, by being locked into the stationary disk, L, also locks the shaft, J, substantially as and for the purpose herein shown and described.

12th, The type-wheel, O, when provided with a pin, h', in combination with the turning cam, P, sleeve, l', on shaft, R, pin, j', on sleeve, i', arm, T, and spring, m', all made as described, and operating in combination with each other, substantially in the manner set forth.

13th, The sliding sleeve, l', which is moved when the type-wheel shaft is stopped, and which is combined with the pin, S, having the arms, M T and U and operating the printing cushion, V, substantially as and for the purpose herein shown and described.

14th, The feed-rollers, p' n', when receiving motion from the friction wheel, H, and when combined with the support, l U, and with the printing cushion, V, all made and operating substantially as and for the purpose herein shown and described.

15th, The printing cushion, V, when pivoted to an upright pin, and when operated by a spring, o', which is secured to one of the arms of the pin, S, substantially as herein shown and described, so that it will be forced with sufficient power against the edge of the type-wheel, and will still be yielding, as set forth.

81,872.—PIANO HAMMER.—C. W. Brewer, Racine, Wis.

I claim a piano hammer, constructed substantially as and for the purpose set forth.

81,873.—RAILROAD CAR HEATER.—Hiram M Britton (assignor to himself and Joel F. Richardson), Cincinnati, Ohio, Antedated March 9, 1868.

I claim the relative arrangement within the car, A, of the hot-air chamber, G, having double metallic walls, e e, and the furnace, D d d, the induction pipes, H, connecting pipes, l l' M N, and fan, J, substantially as and for the purpose set forth.

81,874.—SILK-WINDING MACHINERY.—Henry L. Brown, Mansfield Center, Conn.

I claim the arrangement of the spools, c c', arms, d, and connecting rod, e, in a silk-winding machine, so as to produce an automatic vibratory change motion of one spool, relatively to the other, substantially as described.

81,875.—GRAIN BINDER.—Joseph K. Bull, Buckingham, Iowa.

I claim, 1st, The movable platform, B, hinged or pivoted bars, C, and cord chain, D, in combination with the frame, A, substantially as herein shown described and for the purposes set forth,

2d, The combination of the seat, E, box or trough, G, and pivoted box, I with each other, and with the movable platform, B, and frame A, substantially as herein shown and described, and for the purpose set forth.

81,876.—MEDICAL COMPOUND.—J. H. Butts, Stroudsburg, Pa.

I claim the compound above described, composed and operating substantially as and for the purpose herein set forth.

81,877.—PESSARY.—W. F. Chrisman, Trenton, Tenn.

I claim a pessary, of the form, construction, and method of operation, substantially as shown and described.

81,878.—STEAM SAFETY VALVE.—Gilbert H. Clemens and Everett Clemens, New York city. Antedated August 28, 1868.

We claim, 1st, The arrangement of the enclosed chamber, f, with reference to the valve within said chamber, the levers, h h, and weight, k, below the same, substantially as set forth.

2d, The arrangement of the levers, h h, radially, whereby their shorter ends act directly upon the valve stem, and their longer ends sustain the weight substantially as set forth.

81,879.—PLANE.—Alfred H. Comp, Mount Joy, Pa.

I claim the beveled sliding plate, A and beveled grooved plate, B B, with their screw bearings, when constructed to operate in the manner and for the purpose specified.

81,880.—BED LOUNGE.—J. L. Cox, Manchester, N. H.

I claim the ratchet, b, and lock, x, in combination with the hinge, a, operating back, A, arm, A', with ratchet, m, arm, C, with ratchet, h, and joist, D, the several devices operating relatively to each other, as described and for the purposes specified.

81,881.—HOT-BED SASH AND FRAME.—Matthew Cridge, Allegheny City, Pa

I claim, 1st, In a hot bed sash, the sliding rails or bars, b, constructed and used substantially as and for the purposes hereinbefore set forth.

2d, A slotted following sash bar or rail, f, which forms one side of the sash frame and which holds the other sash bars and the glass securely in position substantially as above described.

81,882.—WAGON BRAKE.—H. Davidson, New Salem, Ill.

I claim the arrangement, herein shown and described, of the brake bar, S, slotted plate, P, U-shaped levers, O H, connection, N, rod, K, formed with an eye at its rear end, bolt, G, arms, E, slotted plate, D, formed with hooks, slotted strap, F rod, C, having a hook at each end, and sliding sleeve, A, all constructed as described, and arranged with relation to the reach, Q, king bolt, M, and pole, B, to operate as set forth.

81,883.—CONSTRUCTION OF WAGON AND CARRIAGE WHEELS.—Matt J. Dawkins, Brookston, Ind.

I claim, 1st, Setting or adjusting the wheel, with the spokes inserted therein, to the tire, by means of cams cast on to a thimble, said cams being located within the hub, and their faces bearing against the spokes, substantially as described and set forth

2d, The hub, made of three parts, viz., the back part, with the main box cast in one piece, the front part, and the thimble, with cams cast thereon.

3d, The step-shaped form on the lower part of the spoke, which rests against the cams.

4th, In combination with the foregoing, the tapering sockets in the centrally divided hub, substantially as described.

81,884.—MANUFACTURE OF SOLID FATTY ACIDS.—Louis Adolphe De Milly, Paris, France.

I claim, 1st, Complete saponification, by means of sulphuric acid in the space of three minutes or less, substantially as and for the purpose set forth.

2d, Also, saponifying by means of sulphuric acid, without distillation, of the fatty acids, and without the usual deposit of carbonaceous, insoluble, tarry matter, which accompanies the existing mode of using sulphuric acid, as described in the specification.

3d, The use of water and white of egg for giving the brilliant whiteness to the candle stuff, substantially in the manner and for the purpose set forth.

4th, The due mixture of the palm and animal fat, substantially as described, for giving the crystalline structure found in this compound.

5th, While I do not claim the use of pressure to separate liquid and solid fats treated with sulphuric acid, I do claim treating this material with the succession of hot and cold pressure, substantially in the manner and for the purpose described.

81,885.—COFFIN.—Edward Ellingen, Mineral Point, Wis.

I claim the coffin, coated upon the inside with a composition impervious to moisture, as described, and rendered air-tight by the india rubber packing, b, let into the under surface of the lid, and held in place by the metallic strip, B, as herein set forth and shown.

81,886.—MACHINE FOR SIZING AND POLISHING BRAID.—John S Fenner (assignor to the The Inman Manufacturing Company), Warren, R. I.

I claim, 1st, The arrangement of driven guide and feed rollers with a rotary brush or brushes, such rollers presenting the braid to the brush or brushes, substantially in the manner shown and described, and so that the braid in passing through the machine shall be repeatedly subjected to the action of the brush or brushes, substantially as described.

2d, The arrangement of guide and tension rollers, j j' c c' d d' g g' and h h', upon opposite sides of brush drums, C D, substantially in the manner and for the purpose described.

3d, In combination with a dressing and polishing machine, mechanism, substantially as herein described, for communicating an intermittent movement to the braid, while it is being acted upon by brushes, substantially as specified.

4th, The arrangement of the weighted roller, F2, and the roller, F, with a sizing trough and drying and dressing brushes, as described.

5th, The arrangement of the guide and tension rollers, c d g, with the brushes, C D, substantially in the manner described.

6th, The combination of the reel, E, sizing trough, F, brushes, C D, guide and tension rollers, j c d g and h, and reel, E1 all arranged substantially as described.

81,887.—CULINARY APPARATUS.—Joseph S. Field, Brooklyn N. Y.

I claim 1st, The apparatus for cooking by steam, when made to be one complete and inseparable vessel, having distinct compartments, for the reception of pans and dishes, each compartment provided with a door, and so arranged that they are all supplied with steam from a common boiler, by means of a side flue, having one of its walls perforated, as herein shown and described.

2d, The vessel, A, when divided, by means of partitions, B, into compartments, which are connected by means of the flue, F, with a boiler, C, each compartment provided with steam-tight doors I, and the flue, F, and boiler admitting of the passage-pipe, G, arranged as described for the purpose specified.

81,888.—STARCH SEPARATOR.—Colgate Gilbert, Buffalo, assignor to J. J. Gilbert, Little Falls, N. Y.

I claim, 1st, The method of supporting and vibrating the bolting frame, A of a starch separator, substantially as shown and described and for the purpose set forth.

2d, The method of supporting the bolting cloth, B, of a starch separator by longitudinal rims, a a a, etc., arranged and combined substantially as shown and described and for the purpose set forth.

3d, The extensible and adjustable tube, composed of the parts, S T U V V when forming part of a starch separator, and arranged and combined to operate substantially as shown and described and for the purpose set forth.

4th, The method of adjusting the incline of a starch separator by means of screws, g, when the same are arranged in combination with the receiver, C, frame, A, and bed, G, all substantially as shown and described and for the purpose set forth.

5th, An improved starch separator, when constructed and arranged to operate substantially as shown and described and for the several purposes set forth.

81,889.—SASH FASTENER.—L. D. Gould, Newark, N. J.

I claim the combination of the bolt e, with the eccentric, a, when combined therewith, by sliding the eccentric in the manner and for the purpose shown.

81,890.—ANTI-SLIPPING PLATE.—W. B. Gould, Boston, and W. H. Harris, Taunton, Mass.

We claim a plate, provided with a device for securing it to a table, substantially as set forth.

81,891.—GRAIN BINDER.—J. B. Greenhut, Chicago, Ill.

I claim, 1st, The rake, C, constructed as described, in combination with chain, E, guide rail a, plate, D', hook, e, plate, D, pin, g', and guide, F, or their equivalent devices, the whole arranged and operating substantially as herein set forth and specified.

2d, The compresser, R, consisting of standard, W, provided with cam, y, hook, v', and plates, u and v, the compressing arms, Y Y, plates, Y' Y', and adjustable spring lever, Z, each part constructed as described, and all arranged and operating substantially as herein set forth.

3d, The regulating device, consisting of segment, M, pawl, N, adjustable plate, S, bent rod, 2, and connecting plate, q, all arranged and operating substantially as and in the manner herein described and specified.

4th, In combination with the compresser, R, the cap, H, provided with opening, I, and flange, l', with its pawl, 3', substantially as and for the purposes set forth.

5th, The combination of the knife, 3, fork, 4, and device, IV, and cam flanges, U', all arranged and operating substantially as set forth.

6th, The binding device, consisting of case, A'', shaft, B'', rod, H'', pin, G'', spring, h'', fingers, K'' K'', pinion, C'', head, c'', flanges, d'' d'', yoke, e'', and forked standard, D'', or their equivalents, each and all constructed, arranged, and operating substantially as and in the manner herein described and specified.

7th, The bent lever, L'', brace, m'', case, A'', and arm, 7, of the device, IV, in combination with the fingers, K'' K'', and the mechanism for operating the same, the whole constructed and arranged substantially as herein described and for the purpose set forth.

81,892.—GAS HEATER.—J. T. Greenwood, Beloit, Wis.

I claim a kerosene stove, herein described, or its equivalent, when made of wood, in combination with cold-air drafts, a a, the lining, F, cold-air chambers, e e a a, deflector, d, cones, L L, tank, M, cover, M', and cooler, I, when the whole is constructed and arranged substantially as and for the purpose herein set forth.

81,893.—GLOBE VALVE.—G. D. Hadley (assignor to himself and Gardner Waters), Cincinnati, Ohio.

I claim a globe valve when constructed with a blank surface, A, above the screw, a, in the body or shell of the valve, and the corresponding blank surface, B, above the screw, b, on the stand, D, so that when the screw, b, is relieved from the screw, a, and the valve, E, is bearing upon its seat, the blank surfaces, A and B, shall form a perfect guide for the purpose of grinding the valve to its seat without being obliged to remove the handle or the packing from its stuffing box or the body of the valve from its connections.

81,894.—EXPLOSIVE COMPOUND.—Joseph Hafenegger, San Francisco, Cal.

I claim the within described explosive compounds consisting of Nos. 1 2 3 4 5, made of the ingredients enumerated, mixed or compounded in about the proportions specified.

Also, the self-igniting match, compounded of the liquids or fluids enumerated, whether applied separately or mixed, to the explosive compounds or materials sought to be ignited or exploded, substantially as described.

81,895.—SERVICE PIPE FOR BUILDINGS.—Edward Hagan, New York city.

I claim the casing, E G and N, inclosing the service pipes, forming spaces around the latter, the casings being provided with apertures, d, for the introduction of steam or hot air to the spaces surrounding the service pipes, which latter are connected by union joints immediately at the points of junction of the several sections of the casing, E G, doors, O P Q R, being formed in casing, N, opposite the joints of pipes, L J R, all constructed and arranged in the manner and for the purposes substantially as shown and described.

81,896.—CHURN.—T. Haigh (assignor to himself and C. M. Lightner), Harrisburgh, Pa.

I claim, 1st, Suspending the cubical box between the posts, B B, by attaching the trunnions, b d, to two of its diagonally opposite corners, whereby, as the box is rotated, the inclinations of its sides are rapidly changed, as herein shown and described.

2d, The cog wheels, E G, and pulleys, D H, and hollow trunnion, d, all operating together, substantially as described, in combination with the diagonally suspended box and its dasher, all substantially as shown and described and for the purpose set forth.

81,897.—CRANBERRY GATHERER.—Warren Hall, Dennis, Mass.

I claim the arrangement of the joint axle with respect to the chute, when hinged to the carriage body, as set forth, the said axle, under such arrangement, being fastened to the chute.

Also, the combination and arrangement of the series of knives, k k l, with the chute, its teeth and carriage combined, as set forth.

Also, the combination of the receiver, made as described, with the carriage and the chute combined, and constructed in manner and so as to operate as specified.

81,898.—PLANING MACHINE.—S. M. Hamilton, Baltimore, Maryland.

I claim the combination of the adjustable guides, D, with the cutter head, constructed and operating substantially as described and shown.

81,899.—STOVEPIPE THIMBLE.—Gunder E. Hammer, Rochester, Minn.

I claim the stovepipe safe, as constructed, of the inner cylinder, B, outer cylindrical casing, A, and perforated heads, the lower head being made in two parts, one of which is fixed to the cylinders, A B, while the other, E, is hinged to the outer cylinder, and provided with fastening devices, as herein shown and described for the purpose specified.

81,900.—COCK OR FAUCET.—Chas. Harrison, New York city.

I claim, 1st, The piston h, formed hollow, in combination with the guide, m, valve, n, and cylinder I, as and for the purposes specified.

2d, The grooves, t, within the cylinder, f, in combination with the piston, h, and valve, n, as and for the purposes set forth.

81,901.—BRICK MACHINE.—Peter Hayden, Pittsburgh, Pa.

I claim, 1st, The intermittingly rotating cylinder, M, provided with the press boxes, L', followers, T, recesses, d, and teeth, f, in connection with the crank arm, f, on shaft, N, all arranged to operate in the manner substantially as and for the purpose specified.

2d, The plunger R, operated substantially as shown and arranged, in relation with the followers, T, for the purpose of compressing the clay in the press boxes, substantially as set forth.

3d, The plunger, U, operated from the plunger, R, through the medium of the lever, V, for the purpose of discharging the bricks from the press boxes, L', substantially as shown and described.

4th, The combination of the pressure rollers, F I, rotary shaft, K, provided with the spiral wings or blades, b and b', the cylinder, M, provided with the press boxes, L', with the followers, T, therein, the plungers, R U, and the fixed cam, X, all arranged to operate in the manner substantially as and for the purpose specified.

81,902.—FIFTH WHEEL BENDER.—G. W. Heckart (assignor to himself and C. Kramer), Columbiana, Ohio.

I claim a bending machine for fifth wheels consisting of a series of forms, B, clamping screw, C, and adjustable bending device, formed of the arm, x, rollers, f and h, levers, D 7 8 9 and 12, link, 11, and arm, 10, the whole being constructed, arranged, combined, and operating as herein described and for the purpose set forth.

81,903.—MANUFACTURE OF SHEET AND PLATE IRON.—C. C. Hinsdale, Cleveland, Ohio.

I claim, 1st, The herein described compound, and the manner of using the same, in the process or mode of making plate or sheet iron, substantially as and for the purpose set forth.

2d, Coating the metal with plastic alloy separately, and in combination with lamp black, or its chemical equivalents, for the purpose set forth in the process described.

81,904.—STOVE GRATE.—Benjamin F. Holbrook and Ebenezer B. Kumrill, Boston, Mass.

We claim a movable bed-plate, B, substantially as and for the purpose set forth.

Also, a bed plate, B, revolving on balls, c c c c, substantially as and for the purpose described.

Also, the movable bearing or loop, g, in combination with the revolving bed-plate, B, and arbor, D, of the revolving grate, C, substantially as described for the purpose set forth.

Also, the annular ring, H, for protecting the revolving bed-plate and supporting the lining, substantially as described.

Also, the sliding and removable port cover, F, in combination with the port E, and arbor, D, with its spring, m, constructed and operating substantially as and for the purpose specified.

Also, an arbor, D, so pivored to its grate as to admit of being readily connected therewith or disconnected therefrom, substantially as and for the purpose set forth.

81,905.—VENTILATOR.—William Holzhauser, Buffalo, N. Y.

I claim, 1st, The combination, with the system of pipes, B b' F, of a fan blower, C, for the purpose and substantially as described.

2d, The combination with said system of pipes, of the revolving wind catcher, D, constructed and operating substantially as and for the purpose described.

3d, In combination with the above, the main regulating dampers, G G', and registers, H H', arranged and operating as described.

81,906.—COTTON SEED PLANTER.—Gilbert Jessup, Shortsville, N. Y. Antedated August 27, 1868.

I claim, 1st, The construction and arrangement of the revolving cylinder, B, with its slots, J, shaft, P, in combination with the stationary cylinder, A, or its equivalent, for the purposes herein described.

2d, The rock shaft, b, arm, H, and spring, o, in combination with the revolving cylinder, B all acting conjointly, in the manner and for the purposes shown and described.

3d, The spring, G, or its equivalent, in combination with the pins, v, for the purposes set forth.

4th, The longitudinal adjustment of the shaft, P, and cylinder, B, in combination with the stationary cylinder, A, or its equivalent, for the purposes of regulating the quantity of seed being distributed.

81,907.—WATCH REGULATING ADJUSTMENT.—Frank G. Johnson, Port Richmond, N. Y.

I claim the fixed screw shaft, a, upon which the grooved nut, c, carrying the end of the regulating hand, d, is rotated, all arranged and operating as described, for the purpose specified.

81,908.—MANUFACTURE OF IRON AND STEEL.—John Allcock Jones, Middlesbrough, England.

I claim, 1st, The production of iron and steel, from cast or refined iron, by first melting or puddling the same, adding thereto purifying agents or fluxes, then separating as much of the slag as it is practicable to separate therefrom, and removing the crude iron or metal resulting to furnaces or crucibles, and melting the same, as hereinbefore described.

2d, The preparing the crude iron or metal without the employment of a puddling process, and melting the same into cast steel, as hereinbefore described.

3d, The conversion of cast iron into malleable iron without the employment of the puddling process, by allowing the metal to remain for a sufficient period in the puddling or other furnace, as hereinbefore described.

4th, The employment of a bath, consisting of a slag or cinder, in which the crude iron resulting from the processes before referred to is melted, so as to be converted into steel, as hereinbefore described.

5th, The subjecting the crude iron resulting from either of the processes hereinbefore described to pressure, so as to separate the portion of the cinder or slag therefrom, prior to its being placed in or upon the steel melting hearth or furnace.

81,909.—ICE BOAT.—Thomas B. Kelley, Dundee, Ill.

I claim a boat, provided with the water tight compartment or case, B, open at top and bottom, with the propelling wheel mounted in a sliding adjustable frame, D, fitted within said case, B, for the purpose of adapting the boat for use either on the ice or water, substantially as set forth.

81,910.—ESCAPEMENT.—Wm. C. Kellum, San Francisco, Cal.

I claim, 1st, The detent, F, and the adjusting screw, d, together with the curved arm, H, and the spring, I, operated by the liberating pin s, or its equivalents, locking by spring or gravitation, substantially as and for the purposed scribed.

2d, The escape wheel, B, moving in a plane parallel to that of the balance staff and of the plates, A A, and giving impulse to the pallet, c, either from the sides or point of the teeth, in combination with the detent, F, arm, H, and spring, I, substantially as described.

3d, The balance staff, C, standing parallel with the plate, A, and the liberating pin, s, passing alternately above and below the lip, J, at each vibration, substantially as described.

81,911.—CORN PLANTER.—I. J. Kidd, Young Settlement, Texas. Antedated August 28, 1868.

I claim the arrangement of the feed wheel, c, pulleys, K K, plow beam, B, cords or bands, j j, roller, I, spout, F, and plows, B and H H, the several parts being constructed and operated substantially as and for the purpose specified.

81,912.—FACE TESTER FOR MILLSTONES.—James Kuhn, Mount Pleasant, Pa.

I claim the circular block, A, of wood or other suitable material, provided with concentric annular projections, a, on its face side, substantially as and for the purpose set forth.

81,913.—BURGLAR ALARM.—N. P. Larsen, Chicago, Ill.

I claim, 1st, The lever, D, plate, E, with pin, f, spring, F, and wire H, all combined and operating as and in the manner herein described, and for the purpose specified.

2d, In combination with the above, the pin, b, of the hammer, B, and the bobbin, O, arranged substantially as set forth.

3d, The key, K, when used as described, and provided with cam, L, for the purpose of operating the trigger, N, as herein shown and specified.

81,914.—SEEDING MACHINE.—J. L. Linderman, Rockford, Ill.

I claim, 1st, The wheels, E, provided with seed channels upon their peripheries, extending rearward from the seed cups, and made tapering in form, as shown and described, for the purpose set forth.

2d, The wheels, E, constructed as described, in combination with partitions, F, constructed and arranged as described, double inclines, G, and spouts, G', the whole being combined and operated substantially as and for the purpose described.

3d, The wheel, C, and shaft, c, and slotted bearings, c', in combination with gear wheels, B D', and frame, A, as and for the purpose described.

81,915.—LAMP SHADE.—E. A. Locke and W. N. Weeden, Boston, Mass.

We claim a lamp shade ring made from a strip, when the abutting ends of the strip are held together by projections thereon, which are inserted into a loop formed on one of the spring supports, f, as specified.

81,916.—VARNISH FOR METAL, WOOD, AND PAPER OR OTHER FABRIC.—Robert Love Hoboken, N. J.

I claim an enamel paint, or varnish, composed substantially as described, for the purposes specified.

Also, forming or compounding an enamel, paint, or varnish of the materials specified, substantially as described.

81,917.—LAMP CHIMNEY CLEANER.—M. N. Lovell, Erie, Pa.

I claim, 1st, The handle, A, of a lamp chimney cleaner, provided with the spring clamp, b, and hook, c, substantially as and for the purpose described.

2d, The handle, A, of a lamp chimney cleaner, provided with the grooved and curved portion, B, in combination with the clamping spring, b, and hook e, substantially as and for the purpose described.

81,918.—STUMP EXTRACTOR.—Charles C. Manuel (assignor to himself, William G. Elkins, and O. N. Elkins), North Troy, Vt.

I claim, 1st, The arrangement of the main timbers, A A and their accessory cross beam, B, braces, D and E, uprights, C and H, cross beams, G, bolster, J, when mounted on four wheels, and constituting the frame of a machine for extracting and removing stumps and other heavy bodies, all substantially as shown and described, and for the purpose set forth.

2d, The arrangement of the chain, a, and its accessory sheaves or pulleys, d e g, and hooks, b b' c, and roller, f, in combination with a frame mounted on wheels, substantially as described, and any suitable gearing for actuating the said chain, all as and for the purpose set forth.

3d, The combination, in a stump extractor, of the accessory gearing, k j h l m, and rope, n, all arranged to operate substantially as and for the purposes set forth.

81,919.—GARBAGE BOX.—John L. Mason, New York city.

Antedated August 27, 1868.

I claim, 1st, The rising and falling slide, S, in combination with the garbage receptacle, R, constructed and operated as and for the purpose described.

2d, The revolving column, P', in combination with the slide, S, and receptacle, R, constructed and operated as and for the purpose set forth.

81,920.—MEDICAL COMPOUND FOR CATTLE AND OTHER ANIMALS.—David P. Mathews, Winthrop, Mass.

I claim as my invention the said composition, composed of the constituents hereinbefore mentioned.

81,921.—CLOTH MEASURING MACHINE.—David Max (assignor to himself and Thomas Waltz), Newton, Ill.

I claim 1st, The indicator, consisting of the shaft, H, worm, I, spurwheel, F, pointer, K, and annular index, G, in combination with the rolls, C D L L', and friction brakes, N N' all arranged and operating substantially as described for the purpose specified.

2d, In combination with a cloth measuring machine, substantially as herein described, the rolls, L L', composed of the roll proper, a, and clamping piece, a', connected by means of the flaring ferrules or bands, b, substantially as and for the purpose set forth.

81,922.—GAS MACHINE.—Hiram S. Maxim, New York city.

I claim, 1st, A gas machine, in which the production of gas is automatically stopped when its pressure as well as its quantity is excessive, and as automatically restarted when the difficulty is overcome, as set forth.

2d, The cylinder, e, connected with the enclosed tank, D, to show the hight and pressure of the contents of the tank, and to convey part of them to the heating chamber as specified.

3d, The burner tube, G, when provided with a valve, h, which is connected by a diaphragm, j, so as to be closed when the pressure of the gas is too high, as set forth.

4th, The combination with each of the four separate vessels, A B D and I, the latter having the elastic diaphragm, J, stretched across it substantially as herein shown and described.

5th, The device for automatically operating the valve, s, which regulates the flow of gas into the gas holder, I, said device consisting of the diaphragm J, pin, o, lever, L, lever, t, arms, w x, and springs, y, all arranged, combined, and operating, substantially as herein shown and described.

6th, The pipe, M, for conducting the evaporated gasoline to the gas-holder, and for mixing it with the required quantity of air, said tube containing the perforated partition, b', the interior tube, c', and the valve, e', all made and operating substantially as herein shown and described.

7th, The cam, z, for keeping the valve, s, closed, as set forth.

8th, The pipe, f', for conducting illuminating-gas from the gas-holder, I, to the heating chamber, a, substantially as and for the purpose herein shown and described.

81,923.—SPRING BED BOTTOM.—A. McDaniel (assignor to himself and S. J. Henion), Dubuque, Iowa.

I claim the combination and arrangement of the rails, B, rods, C, springs, D, and rails, F, provided with the upper springs, L, all substantially as and for the purpose described.

81,924.—FORWARD AXLE FOR CARRIAGES.—Hiram McIlroy, Poplar Ridge, N. Y.

I claim, 1st, The central pivot and socket, in combination with the hooks and flanges on the circles for uniting the head block and axle, substantially as described.

2d, The chambered upper circles and hooks, and pivot socket, provided with the leather packing, substantially as and for the purpose described.

3d, The upper circle bar or plate, provided with the chambered circles and hooks, and with the central pivot, all cast in one piece, and united to the head block in the manner described.

81,925.—COMBINED SPUR AND CREEPER.—Ferdinand Mehrmann, Fountain City, Wis.

I claim a combined spur and creeper, made and operating substantially as herein shown and described.

81,926.—CORSET.—Emilie J. Meriman, New York city. Antedated September 4, 1868.

I claim supporting the corsets and the clothing depending therefrom, by means of straps, I I, the ends of which are attached by an adjustable lacing or other fastening to the waistband or middle of the corset, substantially as and for the purposes set forth.

81,927.—MILLSTONE VENTILATOR.—John Metherell, Rockford, Ill.

I claim the arrangement of the pipes, F, provided with fans, as described in combination with the cooling chamber, G, central passage, H, and fan, I, as and for the purpose set forth.

81,928.—BRICK MACHINE.—John C. Miller, Bushnell, Ill.

I claim the tub, E, and shaft, G, in combination with the frame, A, ways, c c, cog-wheels, H and I I, and molds, D D, all constructed as described, and operating substantially as and for the purposes herein set forth.

81,929.—PLANE FOR CUTTING BLIND SLATS.—John H. Miller, Oskaloosa, Iowa.

I claim the pivoted arms, G, and connecting rod, H, upon the carriage, F, when constructed and operating substantially as and for the purpose specified.

81,930.—BELLOWS PUMPING APPARATUS.—Simon Motte, Paris, France, assignor to Isaac Hyneman.

I claim 1st, A bellows pump having a depressed valve in its stationary base plate, and a removable cover in its vibrating piston or lid, all substantially as shown and described.

2d, A bellows pump, in which the fluid is received and discharged from near the end opposite the axis of vibration, by means of the piston, B', through confluent pipes, substantially as described.

81,931.—REVERSIBLE LATCH.—W. T. Munger, Branford, assignor to P. Corbin and F. Corbin, New Britain, Conn.

I claim the divided horse-shoe, formed of the part, i, pivoted to the portion, d, in combination with the latch, g, and shank, f, attached to the horse-shoe, so that it may be revolved for reversing said latch substantially as set forth.

81,932.—ORE AND BONE CRUSHER.—Amos Newell, Redwing, Minn., assignor to himself, Henry S. Brown, Frederick Arnold, and Alfred Arnold.

I claim two distinct sets of hammers, so made and arranged as to revolve in opposite directions, adapted to and in combination with the case, A, substantially as and for the purpose described.

81,933.—MILL FOR PULVERIZING BONE, ETC.—Amos Newell, Redwing, Minn., assignor to himself, Henry S. Brown, George F. Arnold, and Alfred Arnold.

I claim the case, A, hammers, B, and partitions, C, combined and arranged substantially as shown, for the purpose herein set forth.

81,934.—WASH BOILER.—Joseph Okey, Indianapolis, Ind., assignor to himself and Ferdinand A. Lehr.

I claim the door, m m, when constructed with slotted sides, in combination with the chambers K K, and pipes, d e, and f, substantially in the manner described, and for the purpose set forth.

81,935.—SEEDING MACHINE.—Lucius M. Olden, Pana, Ill.

I claim, 1st, The application to the seed passage of a drill tooth, of a feeding device, l, or its equivalent, substantially as described.

2d, The combination of feed wheel, y, hinged funnel, G3, and a drill tooth, which is constructed with a feeding device, l, or their respective equivalents, substantially as described.

3d, The vibrating frame, C, carrying coulters, C1, and suspended by means of a lifting chain, L, in combination with drill teeth, which are suspended from said frame, C, by means of chains, L' substantially as and for the purposes described.

4th, The devices, substantially as described, for disengaging wheels, D, from their axle, D', when frame, C, is lifted, in combination with drill teeth which have feeding devices applied within them, substantially as described.

81,936.—BEDSTEAD AND QUILTING FRAME.—John Park, Joliet, Ill.

I claim the arrrangement of the shaft, A, legs, B B B B, with their pawl, D, and rack bar, C, and the rollers, K K, with their ratchets, h, and spring pawls, g, the whole combined, adjusted, and operating as herein set forth.

81,937.—STEAM GENERATOR.—Quintin Parker, New York city.

I claim the combination of the pipe, G, with the boiler sheet, A, suspended from the upper plate of the deflector, E, in rear of the flue sheet, substantially as herein shown and described.

81,938.—SHAFT JOURNAL.—Lewis Patric, Shortsville, N. Y. Antedated August 27, 1868.

I claim, in combination with the socket gudgeons, or journals, G, and shaft, S, the screw or threaded eye-bolt, f, and clamping screw, s, as and for the purposes set forth.

81,939.—MEAT CHOPPER.—Thomas Payne, Grand Rapids, Mich.

I claim the combination of the crank shaft, I, gear wheels, K and L, shaft, M, crank wheel, N, pitman, O, arm, P, rack shaft, Q, cross head, R, short connecting rods, S stems, T, and knives, U, with each other and with the frames B, and revolving chopping box, C, substantially as herein shown and described, and for the purpose set forth.

81,940.—SHAFT COUPLING.—Philip Peffer, Milroy, Pa.

I claim the combination, with the shafts, D and E, when connected together by a point and socket, of the spring, C, substantially as and for the purpose described.

81,941.—DROPPER FOR HARVESTERS.—G. M. Peters, Lancaster, Ohio.

I claim, 1st, Hinging or pivoting the platform to a bent arm or support, by means of which it is operated, in such manner as to admit of a reciprocating and tilting movement, substantially as described.

2d, The bent arm or rod to which the platform is hinged, and by means of which said platform is vibrated, in combination with the rod or link for tilting the platform upon its operating arm.

3d, The bent rod or arm, J, link, J', crank, K, connecting rod, L, and lever, M, or their equivalents, in combination with the platform, I, arranged and operating substantially as described.

81,942.—GRASS SEED SOWER.—Darius G. Pickett, Stockton, N. Y.

I claim the combination, with the seed slide, B, of the pins, f f, holes, d d, and cross partitions, g g, the whole arranged as described, and operated in the manner and for the purpose specified.

81,943.—WHEEL FOR VEHICLE.—Henry Poth, Pittsburg, Pa.

I claim, 1st, The combination in a vehicle wheel, of the tenon plates, e, beveled ring, d, screw box, B D, and metal hub, A, substantially as herein shown and described.

2d, The combination, in a vehicle wheel, of the screw box, B D, packing rings, c and f, when arranged to form an oil tight space, h, between the box, B, and the metal hub, A, and provided with holes for the screw, i, all substantially as herein shown and described.

81,944.—GAS PRESSURE REGULATOR.—Charles C. Ramsay, Chicago, Ill.

I claim the combination of chamber, B, having the diaphragm, b, with the spiral spring, H, arranged as shown, with the valve, C, resting on the lever, E, connected to the diaphragm by a rod, F, all arranged to operate substantially as herein set forth.

81,945.—CLOTHES-PIN.—Joseph A. Rand, Morrisville, Vt., assignor to Thomas A. Mitchell, Washington, D. C. Antedated August 27, 1868.

I claim the arrangement and construction of the pieces, A and B, with the square head, C, and its aperture, D, at one end, as herein described, and for the purposes set forth.

81,946.—DEVICE FOR LOADING COAL.—Daniel Risher, Jr., Dravosburg, Pa.

I claim, 1st, The mode of loading coal into boats, flats or barges, by sliding the coal down a chute into a hopper hung to a car, and thence running it down an inclined track to the boat, flat, or barge, and discharging it from either end of the hopper into the boat, flat, or barge, substantially as hereinbefore set forth.

2d, The tipping coal hopper, g, made with the bottom concave or sloping down toward the middle from the discharging ends, substantially as and for the purposes hereinbefore set forth.

3d, The tipping coal hopper, g, connected by bearers, d, with a rocking shaft, d', mounted on a car or truck, substantially as and for the purposes hereinbefore set forth.

4th, Sliding bars, m', carrying a coal-hopper, so connected with the bearers, d, as that, by a slight longitudinal motion imparted thereto, the center of gravity of the loaded hopper may be shifted, substantially as and for the purposes above set forth.

5th, A tipping handle, i, attached to the rocking shaft, a, of a coal loading car, in combination with tripping devices, constructed and used substantially as and for the purposes hereinbefore expressed.

81,947.—CHALK AND SAND-PAPER HOLDER FOR BILLIARD-TABLE.—Charles F. Ritchel (assignor to himself and Henry S. Haynes), Chicago, Ill

I claim an improved chalk and sand-paper holder, formed by the combination of the recessed blocks, A and B, with each other, said blocks being constructed and arranged substantially as herein shown and described, and for the purpose set forth.

81,948.—FAUCET.—Francis Roach (assignor to himself and Joseph Zane), Boston, Mass.

I claim the arrangement of the induction and eduction pipes, b c, the valve seat, a, the valve, D, the case, A, the spring, D', the stem, C, the cap, B, the neck, d, the key, E, and the cams, f f, and stops, g g, the whole being as and to operate as hereinbefore described, and as represented in the accompanying drawings.

Also, the arrangement and combination of the two holes, h i, with the key, E, and the spindle, C, arranged and combined with the valve, its spring, and case, as specified.

Also, the combination of the adjusting screw, F, and the annulus, k, applied to the spindle, C, as described, with the key, E, arranged with the spindle, C, its valve, and spring, and the neck, d, substantially in the manner and under circumstances as hereinbefore specified.

81,949.—SOFA BEDSTEAD.—S. R. Roscoe, Obion County, Tenn.

I claim the combination of the cushions, D and E, with the folding headboards, A and B, the hooks, d d, the eyes, b b, and the couplings, m n, all constructed and operating substantially as and for the purpose described.

81,950.—BRIDGE.—Henry A. Rust, and Ludwig Hermann, Chicago, Ill.

We claim, 1st, The arrangement of one or both ends of the main braces, when constructed in a convex or rounded form, in corresponding concave grooves or recesses in the blocks, B and E, substantially as specified.

2d, The arrangement of the inclined end of the counter braces, in a corresponding inclined recess in the top block, to operate substantially as set forth.

81,951.—GRAIN SEPARATOR.—David Shannon, and William Spencer, Winslow, Ind.

I claim, 1st, The combination of the cylindrical drum, M, case, C, with inclined planes, I, openings, H, lever, E, strap, G, and bar, D, all substantially as herein set forth.

2d, The lever, E, pivoted at one end, and suspended at the other by means of a strap, G, in combination with the pivoted center bar, D, when operating for the purpose of giving proper pitch to the box, C, substantially as and for the purposes herein set forth.

3d, The bent wires, i i, on the end of the cylinder, d, when acting in combination with the spout, P, to feed the grain from the hopper, O, into the drum, M, substantially as and for the purposes herein set forth.

81,952.—LATHE HEAD.—Henry F. Shaw, West Roxbury, assignor to James A. Woodbury, and Solomon S. Gray, Boston, Mass.

I claim, 1st, The combination of the gears, D and E, the disk, P, having the spring pin, p, and eccentric sleeve, c, attached thereto, and the pulley block, C, provided with the eccentric sleeve, d, all arranged substantially in the manner and for the purpose specified.

2d, The combination of the pulley block, C, provided with the cam sleeve, d, disk, P, and eccentric collar, c, catch, S, and gear wheel, E, substantially as and for the purpose set forth.

81,953.—MECHANISM FOR OPERATING THE BED OF PLANING-MACHINES.—Henry F. Shaw, West Roxbury, assignor to James A. Woodbury, and Solomon S. Gray, Boston, Mass.

I claim, 1st, In combination with the bed of a planing machine, the rack, e, pinion, d, and shaft, g, or their equivalents, and the internal and external gears, f e, eccentric sleeve, i i', and the fast and loose pulleys, when arranged and operating substantially as specified, and for the purpose set forth.

2d, The arrangement on the shaft, g, of the fast and loose pulleys, the eccentric sleeve, i i', and the internal and external gears, e e', substantially in the manner shown, and for the purpose set forth.

81,954.—LADDER OR STEP FOR STREET LAMP-LIGHTER.—M. M. Smith, Nashville, Tenn.

I claim a step ladder for lamp posts, constructed substantially as and for the purpose shown and described.

81,955.—FANNING-MILL.—H. A. Snyder, Shullsburg, Wis.

I claim the hinged board, B, actuated by spring tension acting against the blast of a fanning mill, and connected with gates or valves, H, closing the ingress aperture, I, of the fan wheel box, A, all substantially as shown and described, and for the purpose set forth.

81,956.—MACHINE FOR SEWING THE UPPERS TO THE SOLES OF BOOTS AND SHOES.—Michael Joseph Stein, New York city.

I claim, 1st, In combination with the needle and the self-adapting rest, which is to rest and ride on the sole of the shoe or boot that is being sewed, and which is to bear against the bottom of the inner channel cut in the leather, to resist the pull of the needle, a second rest, so formed that it shall rest and ride on the surface of the sole, that in sewing it may not interfere with the loop of thread, the two being connected and having a mode of operation in connection with the needle, substantially as herein described.

2d, The curved needle, when made and mounted so that its inner curved surface is concentric with its axis of vibration, and eccentric on its outer surface, substantially as and for the purpose specified.

3d, The pointed cast off, with its outer surface eccentric, in combination with the needle, the contiguous surfaces of the two being flat, and both being mounted, so that they shall work in contact, substantially as and for the purpose set forth.

4th, Attaching the lamp and its cap, and the flue through which the thread passes, to the movable plate which carries the sewing mechanism, substantially as described, that the means for heating and guiding the thread may be always in the same relative positions, as set forth.

5th, The feeding pawl, with its projections, working in cam-formed recesses, or the equivalent thereof, having a like mode of operation, in combination with the movable table on which the last holder moves, or the equivalent thereof, by means of which combination the feeding pawl spaces the stitches equally, notwithstanding it acts on the undulating surface of the sole, as described.

6th, The welt guide, substantially such as described, in combination with the mechanism, or the equivalent thereof, for guiding the sole on the last relatively to the sewing mechanism, as described.

81,957.—FANNING MILL.—William Stoddard, Winona, Minn.

I claim, 1st, The combination, with the hopper of a fanning mill, of the oscillating feeding bar, A, substantially as and for the purpose described.

2d, The combination with the screen, C, of the endless apron or belt, D, substantially as and for the purpose described.

3d, The rotary screens, L and M, arranged as described, in combination with the chute, G, screen, C, and fan blower, substantially as and for the purpose described.

81,958.—SAFETY BRIDGE FOR RAILROAD CAR.—Eli Sturgeon, Columbiana, Ohio.

I claim the adjustable bridge, A, with spiral springs, b b, attached to the bumpers or platforms of railroad cars, C, by means of hook, d d, on the four uprights, c c c c, in the manner and for the uses and purposes set forth and herein more fully described.

81,959.—TAILORS' PRESS BOARD.—Howard M. Thompson and Charles W. Burbank (assignors to themselves and George H. Knowlton), Alfred, Me.

We claim the press board supporter substantially as described, that is, as composed of the base board, D, the standard, C, the arm, E, and the clamp-jaw, F, connected in the manner so as to operate as explained.

Also, the combination and arrangement of the adjusting screw, e, and nut, f, with the connection rod, c, the clamp jaw, F, the base board, D, the standard, C, and the arm, E, arranged and combined substantially in manner and for the purpose as specified.

Also, the combination of the press board, B, and mechanism, substantially as described, for supporting it above, and fixing or clamping it to a table, as explained, such mechanism consisting of the base board, D, the standard, C.

the arm, E, the clamp jaw, F, and the connection rod, c, or their mechanical equivalents.

81,960.—BRIDGE.—James K. Thompson, (assignor to himself and William B. Howard), Chicago, Ill.

I claim the wrought iron chords, A A', each consisting of several bars placed apart and edgeways, and the plates, b b' and stays, E E, connecting the said bars, when used and arranged substantially as herein described and specified.

81,961.—CAR COUPLING.—Anson C. Tichenor, Council Bluffs, Iowa.

I claim the combination of a draw head, A, constructed substantially as described, and provided with a transverse locking ledge, a, with a hinged block, B, constructed with a shoulder, c, when said block is so connected to the draw head that the forward motion of the cars will automatically lock the shoulder, c, beneath the ledge, a, in the manner and for the purposes specified.

81,962.—ENVELOPE.—Sigmund Ullman, New York city.

I claim securing the eyelet, d, in the open flap, c, of the end, by gumming a strip of paper over said eyelet, at the outer side of the flap, as herein shown and described.

81,963.—ENVELOPE.—Sigmund Ullman, New York city.

I claim an envelope having its ends cut and folded in the manner as herein shown and described.

81,964.—STEAM CONDENSER.—Augustus Van Orsdale, Jasper, N. Y.

I claim the combination of the exhaust pipe, C, and deflector, D, with the plates, a a, heater, A, and pipes, B B, arranged and operating substantially as described.

81,965.—MAKING FORKS.—Heman Whipple and Elon Denio, Baldwinsville, N. Y.

We claim, 1st, The cutters, e e, formed wider apart near the stock than at the cutting edge, in combination with the shear, h, for the purposes and as set forth.

2d, The rocking support, I, in combination with the cutter, e, and bed shear, h, for the purposes and substantially as set forth.

3d, The swinging supports, 12, in combination with the winding wedge-shaped, bending plunger, m, arranged and operating substantially as and for the purpose set forth.

4th, The connecting rod, b, and ball, 1 in combination with the screw, 3, head, 4, and hollow plunger, c, carrying the cutting or bending tools, substantially as set forth.

81,966.— BRUSH.—John L. Whiting, Boston, Mass.

I claim the combination and arrangement of the series of projections with the other parts of the brush, as described, the series being productive of new and useful effects, as specified.

81,967.—DOUBLE RATCHET LEVER POWER.—John S. Williams, Chicago, Ill.

I claim, 1st, The combination of the double ratchet pawl, A D, ratchet pinion, F, lever, E, connecting rod, 14, lever, fig. 4, arm 22, treadle, fig. 5, and balancing weight, fig. 6, substantially as set forth.

2d, The combination of the ratchet pinion, F, and gear wheel, g', as and for the purpose set forth.

81,968.—OIL TANK.—Arthur Gates Wilson, New York city.

I claim, 1st, The bottom, F, strainer, H, and tube, G, all arranged and combined substantially as described and for the purposes set forth.

2d, The detachable head B, when so arranged within the cylinder, A, as to have its upper surface fall below the walls of said cylinder, to operate in connection with the supplemental cover, C, substantially as and for the purposes specified.

81,969.—BOW SPRING FOR RAILWAY CARS.—T. F. Allyn, Nyack, N. Y.

I claim a bow spring, composed of one or more plates of metal, either square, rhombic, circular, oval, or any equivalent shape, bent to the form of a bow, so as to have two outside bearing surfaces or points opposite to each other, or nearly so, substantially as described.

Also, the application of the foregoing described plates, in combination with the bolsters or frames of cars or carriages, substantially as described, and for the purpose set forth.

81,970.—COMBINED SCREW DRIVER AND WRENCH.—Edgar John Amor, New York city.

I claim the blade, B, provided with a series of angular-shaped openings, a, near its handle end, with an oblong slot, b, in combination with a removable or detachable fork screw, driving blade, or other bit, arranged to stand at right angles to the blade, B, near its forward end, for operation essentially as described.

81,971.—FEED WATER HEATER AND FILTER.—James Armstrong, Bucyrus, Ohio.

I claim, 1st, The pans, B B, when constructed and arranged substantially in the manner shown and described.

2d, The combination of the steam pipe, G, chambers, F and F', substantially in the manner shown and described.

3d, The chambers, F F', and the filters, e and f, when constructed substantially in the manner shown and described.

4th, The arrangement of the pans, B B', and the disk, B'' substantially in the manner described.

81,972.—STEAM GENERATOR.—James Armstrong, Bucyrus, Ohio.

I claim, 1st, The arrangement of the outer and inner tubes of the boiler whereby the heat is caused to circulate around the inner ones, substantially as shown and described.

2d, The construction of the fire box with the surrounding tubes, as herein shown and described.

3d, The construction of the hollow screws, a, and the arrangement of them with the tubes, B, as herein shown and described.

81,973.—ROLLING MILL.—J. H. C. Bachelder, Winsted, Conn.

I claim, 1st, The slides, J J, with their racks, O, movable bearings, H H, graduated wedges, K, guards, L, and pinions, P P, when arranged, constructed, and operating as described and for the purpose set forth.

2d, The tongs, V, with their lever, Z, spiral spring, X, lever, W, and cam-wheel, U, when arranged, constructed, and operating as described, and for the purpose set forth.

3d, The pin, b, on sliding wedge, in combination with dog, c, shaft, d, upright slotted arm, e', bell lever, f, horizontal side, g, clutch, h, movable coupling, l, treadles, m and n, rod, n, spiral spring, w, loose sleeve, s, arm, u, and shoulder, v, all arranged and operating as set forth.

81,974.—APPARATUS FOR THE MANUFACTURE OF HEATING AND ILLUMINATING GAS.—John A. Bassett, Salem, Mass.

I claim, 1st, The arrangement of the valve, J, in connection with a reservoir of hydrocarbon liquid, for the purpose set forth.

2d, The combination of the chamber, E, with the pump, B the chamber containing a series of foraminous diaphragms or fibrous material, for the purpose substantially as described.

81,975.—YELLOW WASH FOR BARNS, BUILDINGS, ETC.—Henry Bechtold and John Nunamacher, Lancaster county, Pa.

We claim the compostuon of a yellow wash or paint, combined substantially in the manner and for the purpose specified.

81,976.—STEAM SAFETY VALVE.—Horatio B. Beckman, Newburg, N. Y.

I claim the arrangement of the safety valve, A, adjustable elliptical springs s1 s2 s3, and plate, C, substantially as herein specified.

81,977.—SEWER PIPE.—Charles Birkenshaw, Chicago, Ill.

I claim the combination of the chamber, B, pipes, B B', and valve, C, arranged substantially as and for the purpose set forth.

81,978.—HARVESTER RAKE.—George Blake (assignor to himself and Thomas Connar), Whitby, Canada.

I claim, 1st, The case, G, and hollow pedestal, F, for containing and supporting the gearing that operates the rake, substantially as herein shown and described.

2d, The combination of the connecting rod, J, internally toothed segment, I, gear wheel, H, shaft, E, bracket, D, and rake head, C, with each other and with the hollow pedestal, F, and case, G, substantially as herein shown and described and for the purpose of operating the rake, B C.

3d, The spring, L, attached at one end to the bracket, D, and at the other end to the rake head, C, by the pin, M, passing through a slot in the journal of the rake head, in combination with the finger, F, and fixed plane, O, all ranged and operating as described, for the purpose specified.

4th, The combination of the finger, N, stop pin, P, and plane, O, with the rake head, C, and hollow pedestal, F, whether said plane be stationary or adjustable, substantially as herein shown and described and for the purpose set forth.

81,979.—MODE OF PURIFYING WATER.—M. S. Bringier, Ascension parish, La.

I claim the process of filtering water by passing it through a vessel constructed and operating substantially as described, whereby it is subjected to the action of centrifugal force, and a more rapid filtration is effected, as set forth.

81,980.—POTATO DIGGER.—Albert Burhaus (assignor to himself and Henry H. Burhaus), Albany, N. Y.

I claim, 1st, The scoop, E, furnished with the lateral slots, e e e, in combination with the rollers, r r, or their equivalents, as and for the purpose set forth and described.

2d, The double share, B, in combination with the land shoe, C, and the scoop, E, as and for the purpase set forth and described.

3d, The sleve, J, operated by the rod, o, shaker piece, s, rod, d, crank, c, pinion, p, and gear, x, and all in combination with the wheels, N N', and frame, G, and axle, F, as and for the purpose set forth and described.

4th, The sled runners, L L, and boxes, K K', in combination with the sieve, J, and its carriage, as and for the purpose set forth and described.

81,981.—STOCKING STRETCHER.—R. K. Chandler, Ruther Glen, Va.

I claim, 1st, Constructing a stocking stretcher with the hinged sections, A B, and the catching device, D, arranged at the upper side of the sections, in such a manner that the stretcher is expansible after the stocking has been drawn upon it, substantially as described.

2d, Providing for lengthening or shortening the foot portion of a stocking stretcher, by means of a longitudinally adjustable toe section C, substantially as described.

3d, Forming notches or serrations, C, upon the edges of a stocking stretcher, substantially in the manner and for the purposes described.

81,982.—FARM GATE.—Lewis Charles, Clear Springs, Md.

I claim, 1st, The combination of the sliding gate, A, with the pivoted supporting bar, d d', substantially as described.

2d, The combination of the spring stop, s, bar, d d', panel, B, and gate, A, substantially as described.

81,983.— STEAM GENERATOR. —Jonathan M. Clark, New York city.

I claim the angular hollow head, B, constructed with passages, e, for the circulation of water or steam, secured together by pin projections, g, and nuts, f, and with removable covers, a, combined with the tubes, A, substantially as shown and described for the purpose set forth.

81,984.—SUSPENDER.—C. H. Cleveland, Selma, Ala.

I claim the suspender or shoulder brace, composed of two single straps, B B, each passing from the attaching strap at the one side over the shoulder to the attaching strap on the reverse side of the body, when shoulder straps are provided with eyelets, d d, and a bracing cord, D, substantially as described and for the purpose specified.

81,985.—CAR COUPLING.—James M. Cook, Washington, D. C.

I claim the coupling link, B, provided with a shoulder, b', the lever, C, spring, D, and rod, F, when the whole are arranged and combined substantially as described as and for the purposes specified.

81,986.—FLEXIBLE ABRADER AND POLISHING FABRIC.—John H. Crane, Charlestown, Mass.

I claim as a new article of manufacture, the double surfaced flexible abrader, substantially as shown and described.

81,987.—METHOD OF PREPARING, DISICCATING, AND PRESERVING FISH.—William D. Cutler, Philadelphia, Pa.

I claim, 1st, The boned and disiccated fish, as a new manufacture and commercial article.

2d, The herein described process or method of treatment of fish, substantially as set forth for the purposes specified.

81,988.—DOOR AND SAFE LOCK.—John Dillingham, Turner, Me.

I claim, 1st, The peculiar constructed key, having projections or bits, a b c, substantially as and for the purpose set forth and described.

2d The arrangement of the main bolt, in combination with the plunger m, and levers, g g, substantially as described and for the purposes set forth.

3d, The form and arrangement of the plunger, in combination with the levers, g g, acting on the paws, f f, substantially as described.

4th, The arrangement of the sliding plates, which effectually close the several key holes, as and for the purposes substantially as described.

81,989.—LOW WATER DETECTOR FOR BOILERS.— Thomas Dutton (assignor to himself and Thomas Maguire) Port Jervis, N. Y.

I claim the construction of the plug, a, substantially as herein set forth.

81,990.—COMBINED LATCH AND LOCK.—Nathaniel Edwards, Newark, Ohio.

I claim, 1st, the manner of connecting and disconnecting the two knobs, in connection with any opening face plates of locks, by making an indenture G', in connection with either one of the knobs, and a corresponding projection, G, in the other, substantially as above described.

2d, The plate or tumbler bearer, E, in fig. 5, being a slotted plate, with a projection, P, turned out at one end to hold the tumblers in position so that the bolt may work as latch, and with another projection, y, or indenture in such a position as to enter a corresponding indenture, y', or projection in the spindle of the knobs, so as to engage with the same when the tumblers are dropped, when constructed substantially as herein shown and described.

3d, The lever, D, fig. 7, which has a lifter, p, for the joint purpose of raising the tumblers and bracing back the bolt, and in combination with the locking projection, a, and the stud, A, and the projection, R or its equivalent on the bolt, for the purpose above specified, when made and arranged substantially as above shown and described.

4th, The manner of converting the lock from a latch into a night bolt, by raising the tumblers too high to be operated upon by the key, and bracing the bolt in the same operation, by elevating the lifter, p, of the lever, D, by the assistance of x', with its connections, and then locking the same in its elevated position, by causing the stud, A, to engage with the projection, a, by pulling out the tumbler bearer as above specified.

81,991.—MEANS FOR SECURING SPRINGS FOR BEDS AND SEATS —Jeresiah D. Eggleston, Canaan, Conn.

I claim the screw nut, A, combined with the spring, B, substantially as and for the purpose set forth.

81,992.—DYE STUFF.—C. E. Fox, and Mary E. Fox, Gilroy, Cal.

We claim the extract, or coloring matter, of mancineta, as a new article of manufacture, for its various uses, as herein specified.

81,993.—WEDGE-BUCKLE FOR HARNESS.—Kasson Frazer, Syracuse, N. Y.

I claim, 1st, The wedge, W, when made with the transverse slot i, hole, m, and stop, r; the tongue, T made with the journal, o, shank, p, and guard q, each substantially in the form and for the purposes described.

2d, Also, the same parts, in combination with each other, when connected by a joint, and forming a wedge and tongue, substantially in the manner and for the purposes described.

3d, The wedge, W, and tongue, T, when made as aforesaid, in combination with the buckle frame, A, having an angular box, x, as described, all operating in the manner and for the purposes substantially as above set forth.

81,994.—MALT MILL.—John Gardiner, Philadelphia, Pa.

I claim the construction of the cheeks, D D, with steel plates, E E, and the arrangements of the said cheeks with the mashing rollers, B C, substantially in the manner hereinbefore described, and for the purpose set forth.

81,995.—SMOKE HOUSE.—Christian Good, Arcanum, Ohio.

I claim a stationary smoke-house, when constructed as described, and provided with a fire pot, H, trap door, C, in the roof, and with openings in its sides, said openings being covered with wire netting and closed by means of shutters, F F, substantially as and for the purposes herein set forth.

81,996.—PLOW.—Charles T. Grimes, Garrard county, Ky.

I claim, 1st, The modes of making handles, H and K, and so arranging them on beams, G and J, that they may be used as handles for two turning plows, and as helves for two shovel plows, when the turning plows and helves, V and S, and rods, T and W, are removed.

2d, The mode of combining the handles, H and K, and beams, G and J, by means of cross-bars, A a and B b, and rods, C c and D d, and rods E e and Z z, so that the two plows are used by one person.

81,997.—MOULDING MACHINE.—J. P. Grosvenor, Lowell, Mass.

I claim the described arrangement of the hand wheel, J, at the side of the machine, under the edge of the table, A, the beveled gearing, n' i, shaft, H, pinion wheels, h G, screw, F, vertically sliding mandrel-frame, D, and guides, E, as herein set forth, for the purpose specified.

81,998.—ANTI-INTERFERING BAND.—William H. Hall and John R. Clifford, Boston, Mass.

We claim, as an article of manufacture, an interfering rubber guard, when constructed as described, and attached to kersey, as herein shown and for the purposes set forth.

81,999.— CONSTRUCTION OF DOLLS' HEADS. — George H. Hawkins, New York city.

I claim a toy figure head, when composed of a textile fabric, which is previously stiffened with a glutious material, then pressed in parts between heated dies, and afterwards having the edges or seams of such parts joined by means of heated dies, in the manner substantially as herein described.

82,000.—CANDLESTICK.—William H. H. Hinds, Groton, Mass.

I claim, 1st, The cap, a, with its support or supports, n, for the purposes set forth, and substantially as herein described, and as shown in figures 1, 2 and 3.

2d, The receptacle, g, and the slide or sleeve, h, with the catch, p, for the purposes set forth, substantially as herein described, and shown in figures 1 and 3.

3d, The snuffers, f f, supported and operated by means of the cylinder, c, and the collar, d, substantially as herein described, and as shown in figures 1 and 4.

4th, The slit, o, and the notches, 1 2 3 4 5, together with the thumb piece, z, for the purpose set forth, substantially as herein described, and shown in figures 6 and 9.

82,001.—ABDOMINAL SUPPORTER.—S. L. Hockert, assignor to G. W. Perrine), Milwaukee, Wis.

I claim, 1st, Connecting the side spring to the front pad by hooks, in the manner shown.

2d, The side or hip pads, D, attached loosely to the cylindrical side springs, B B, by staples, F, so that the said pads may be perfectly free to move in any direction to adapt themselves to the surface of the body.

3d, Securing the cylindrical side springs to the back pads by screwing the ends of said springs into the button studs, in the manner shown.

82,002.—HORSE HAY-RAKE.—William Holmes, Clarksville, N. Y.

I claim, 1st, The locking bolt, M, moving on a guide way on the axle, and operated by means of the lever to hold the teeth down, substantially as set forth.

2d, The combination, substantially as set forth, of the lever operated by the foot of the driver, and the device for depressing and elevating the rake teeth.

82,003.—SMOKE STACK.—George Holton, Chicago, Ill.

I claim the inverted conical netting, D, attached to the top of the double conical case, B, arranged with reference to the pipe, A, and deflector, C, the latter being held in position over the pipe, A, by rods, E, and having a flange, G, at its top, for supporting the lower end of said netting, substantially as and for the purpose specified.

82,004.—MORTISING MACHINE.—Jas. M. Johnson and John Herig, Cleveland, Ohio.

We claim chisel holders, F F, constructed as described, in combination with the cross head, E, to operate as and for the purpose set forth.

82,005.—BUTTER COOLER.—Ernest Kaufmann and Antony Weber, Philadelphia, Pa., assignors to Ernest Kaufmann.

We claim, 1st, The construction of the part, A, with the ring, C, and combining the chamber, D, therewith, substantially in the manner and for the purpose above described.

2d, The combination of the slip collars, E, journals, a a, and bearings, b b, with the part, A, and cover, B, and spring, C, substantially as described and for the purpose set forth.

82,006.—BEE HIVE.—H. A. King, Nevada, Ohio.

I claim, 1st, The slots, s, in connection with a double tier of honey boxes with comb foundations, as specified, and for the purposes set forth.

2d, Constructing the close fitting top bars, O, with comb guides, U, and slots, as specified, and for the purposes set forth.

82,007.—ROTARY STEAM ENGINE.—Abraham Kipp, Jr., Sing Sing, N. Y.

I claim, 1st, The combination of double cylinders, C C, and D D, open at their inner ends to a steam chamber or space, pistons, E E, and F F, with their rods and yoke, G and H, crank, I, and valve controlling the flow of steam to and from the backs of the pistons, essentially as herein set forth.

2d, The combination of the double cylinders, C C, and D D, arranged, either pair at right angles, or thereabouts, to each other, and with their inner ends open, as described, and in communication with a central or intermediate steam chamber or space, pistons, E E and F F, with their rods, b b, cc, and yokes, G H, crank, I, and valve controlling the admission and escape of steam to and from the backs of the pistons, substantially as specified.

3d, The valve, K, when constructed and arranged for operation, in combination with the double cylinders, their pistons and crank, substantially as shown and described.

82,008.—ANIMAL TRAP. —T. B. Kirby, Flowerfield, Mich.

I claim the combination and arrangement in the rectangular frame, A, divided by the partitions, C and E, of the valve, H, with the perforated bait box, K, having a hinged cover, F, substantially as and for the purposes herein set forth.

82,009.—PAVING ROLLER.—Edmund W. Kittredge, Cincinnati, Ohio.

I claim, 1st, The suspension of one or more cressets to the axle, within the revolving cylinder, substantially as and for the purpose set forth.

2d, The closing with covers the ends of a revolving roller, within which are suspended one or more cressets for holding fire, substantially as and for the purpose set forth.

3d, The arrangement of cylinder, A, revolving on a fixed axle, D, from which are suspended one or more cressets, J and to which are secured the perforated heads, F F', as and for the purpose set forth.

4th, In combination with the elements, A D J F F', one or more doors, H, for the purpose explained.

82,010.—JUG TOP.—Peter Lauster (assignor to Lang & Lauster), Allegheny, Pa.

I claim, 1st, The hinge, knob, and lid, made separate and distinct from each other, and united together by making perforations in the hinge and lid, as described, and casting the knob, to unite with them by metal used in producing the knob entering said perforations, to form a rivet, and whereby solder, to establish the junction of said parts, is avoided, and, after riveting of the knob, dispensed with.

2d, The combination, with the lid, hinged to rotate from the inside of the body, of the plate or filling, b, connected with the lower part of the interior flange, a, of the body, substantially as and for the purpose herein set forth.

82,011.—FANNING-MILL.—Elijah Lindsley, Neenah, Wis.

I claim, 1st, The sieves, b and c, when sent as described, and operating as and for the purposes herein set forth.

2d, The screen, d, in combination with the sieves, b and c, when constructed and operating as and for the purposes herein set forth.

82,012.—SPRING BED BOTTOM.—John M. Losie, Indianapolis, Ind.

I claim the slotted metallic plates, E F, constructed as described, in combination with the elastic gum, H, as and for the purpose specified.

82,013.—HORSE SHOE.—Henry D. Lyman, Kalamazoo, Mich.

I claim the attachment of adjustable clips, B, to the heel of a horse shoe, when operating with a pivot, substantially as set forth and shown.

82,014.—VISE.—Austin Z Mason, and Richard B. Robbins, Adrian, Mich., assignors to Richard B. Robbins.

We claim, 1st, In combination with the ring, C, constructed with the oblique faces, x and y, the recesses, m' and n, and one or more projecting stops e and e, to prevent it from turning more than one fourth of a circumference, the whole constructed in the manner substantially as set forth and described.

2d, The spherical bilge, D, with one or more ribs, m and n, or their equivalents, in combination with the ring, C, constructed substantially as set forth and described.

3d, The semi-annular ring, K, in combination with the ring, C, and washer plate, B, substantially as described.

82,015.—BREAST PUMP.—Morris Mattson, New York city.

I claim the combination, with a vacuum glass constructed substantially as described, of an exhausting mechanism or instrument, having a double valvular apparatus operating substantially as and for the purposes set forth.

81,016.—FIRE PROOF SAFE.—Wm. McFarland and Wm. H. Butler, Williamsburg, N. Y.

We claim, 1st, The insulation of each section or recess of the door, in combination with the air spaces as and for the purposes herein set forth.

2d, The method of forming spaces, in the filling of the safe, by inserting patterns of wood, to be withdrawn after the filling substance has set, and supplying said spaces with a vaporizing substance, substantially in the manner as and for the purposes herein described.

3d, The manner of securing the separate sections of the doors by placing supporting blocks, made of material which is a non or inferior conductor of heat between them, so that there is no continuation of metal or good heat conducting substance from the outside covering to the inside repository, as herein set forth.

82,017.—HAMMER AND MALLET.—Wm. S. McNeil, Springfield, Mass.

I claim, 1st, A mallet and hammer combined, in which the mallet, B, fits in a socket, a, constructed in the piece, A, having the head, C, with pene, c, the parts being combined and arranged substantially as herein shown.

2d, The arrangement of the pene, c, upon the head, C, of the hammer, substantially as shown.

82,018.—SWING.—Henry F. Metzler (assignor to Louisa Metzler), New York city.

I claim, 1st, The four suspended vibrating rods or bars, in combination with the pivoted cross bars, for supporting the seat or seats, substantially as and for the purpose described.

2d, The four suspended vibrating rods or bars, in combination with the pivoted cross bars supporting a seat or seats, and the lower pivoted cross bars and treadle or treadles, substantially as described.

82,019.—STOVE PIPE DRUM.—Henry Meyer, Richmond, Ind.

I claim the parabolical flues and damper, constructed and arranged in relation to each other and to the casing of the drum, substantially as set forth.

82,020.—SEWER PIPE.—Philip Meyercordt, Chicago, Ill.

I claim the ingredients herein named, when manufactured into pipes, substantially as herein set forth.

82,021.—GATE.—Reuben C. Mighell, Plano, Ill.

I claim, 1st, The lever, C, constructed and operating substantially as described.

2d, The spring, V, in combination with the fulcrum, H, for the purposes specified.

3d, The combination of the gate, A, lever, C, hinge, D, weight, E roller, G, and pivot, F, all constructed and operating substantially as described.

82,022.—SHOE LACING.—Willard F. Oliver, Lynn, assignor to Boston Shoe-Stud and Button Company, Boston, Mass.

I claim, 1st, A shoe, provided with a series of hooks, or their equivalents, for receiving and holding the string, when arranged substantially as set forth.

2d, The catch or clamp, a, with its arm c, pivoted to the hook, D, and arranged for holding the string, substantially as described.

82,023.—LIME KILN.—Clark D. Page, Rochester, N. Y.

I claim, 1st, The combination and arrangement with the grate bars, g g, of the cross bars, k l, the first being fixed, and forming a fulcrum for the leverage of the grate bars in shaking, and the latter being hinged so as to turn up and down to secure the grates, or allow them to be shaken as herein set forth.

2d, The flues, b, constructed as described, next to the inner edge of the wooden binders, a, of the kiln, to operate in the manner and for the purpose substantially as described.

82,024.—SPICE BOX.—Charles T. Palmer, Norwich, Conn.

I claim, in the spice box or can, as made with a series of holes in its cover or end, or as having a disk or cap to cover such holes, the constructing both the cover or end or head of the box and the disk, with an annular groove in the one, and a corresponding annular bead to project from the other, and to fit to or into such groove, in manner substantially as described.

81,025.—LOW WATER ALARM FOR STEAM GENERATOR.—Stewart B. Palmer, Syracuse, N. Y.

I claim, 1st, The combination of the chamber, B, tubes, C C, with their surmounting chambers, D D, rods, E E, links, a a, and rod, H, arranged and operating substantially as shown and described.

2d, The arrangement of the rod, H, lever, I, and spring, b, with reference to the whistle, J, and its valve.

82,026.—WHEAT DRILL.—Charles W. Patton, Exeter, Ill.

I claim, 1st, The hopper, divided into compartments by the partition, D, and door, D', substantially as and for the purpose set forth.

2d, In combination with the perforated plates, E and F, the graduated key, G, for regulating the amount of grain to be sown, substantially as set forth.

3d, The combination of the lever, H, shaft, H1, arms, H2, and the sliding plate, E, with projection, E2, substantially as and for the purpose set forth.

4th, The combination of the sliding plate, E, key, G, stop, E1, and springs, I, arranged to operate substantially as described.

5th, In combination with the cutters, O, and drag bars, K, the springs on the rods, M, segments, N1, shaft, N, and lever, N2, and cord, N3, for raising the cutters and forcing them into the ground, substantially as set forth.

6th, The combination of the frame, the drag bars, the rear frame, and vertical guide rods, L, substantially as set forth.

82,027.—RECIPROCATING STEAM ENGINE.—Joseph B. Pedrick (assignor to himself and Joseph F. Gent), Lowell Mills, Ind.

I claim the arrangement of the valve, K, valve boxes, G M, and the pipes B A and C D, substantially as shown and described.

82,028.—APOTHECARIES' LABELS.—G. G. Percival, Philadelphia, Pa.

I claim the combination of a graduated scale with an otherwise ordinary paper label, substantially as above described.

82,029.—MARTINGALE.—W. B. Perrie, Horse Head, Md.

I claim, 1st, the loose ring, G, in connection with the part, D, provided with the stud, C, as shown in figs. 1 2 3 4 and 5, substantially as and for the purpose set forth.

2d, A solid ring martingale, D, with the stud, C, projecting from its periphery in the direction of its center, substantially as and for the purpose set forth.

82,030.—ADJUSTABLE TUMBLER FOR PERMUTATION LOCK.—O. E. Pillard (assignor to F. H North), New Britain, Conn.

I claim the circular tumbler, formed of the plates, 1 and 2, and flanges, 3 and 4, and divided as at 6, in combination with the link plate, e, and eccentric, l, constructed and applied in the manner and for the purposes set forth.

82,031.—WINDOW SHUTTER.—Niels Poulson, Washington, D. C.

I claim, 1st, The combination of the folding bars, A A2, and corrugated plates, B, when said plates are attached rigidly to the inner bars, A, as herein described for the purposes specified.

2d, The sliding plates M, in the described combination, with the folding shutter, A A2 B, to mask or protect the vertical edges of the said shutter, substantially as explained.

3d, The arrangement of the tenons, b' b', of the plate, B, alternately on opposite edges of the bars, A, substantially as and for the purposes set forth.

82,032.—AWNING.—Neils Poulson, Washington, D. C.

I claim, 1st, The folding bars, DD', working upon inclined supports, A, and carrying plates or sheets, E, attached to the inner bars, D, substantially as and for the purposes specified.

2d, The tubes, B, employed in combination with the awning, D E, and trough, C, both as a means of support and for conducting water, as explained.

82,033.—WRENCH.—E. W. Quincy (assignor to himself and W. H. Copp), Lacon, Ill.

I claim a sliding handle, as a constituent element of a hand wrench, substantially as described.

82,034.—TILE MACHINE.—William L. Reck, Drake county, Ohio.

I claim the horizontal rocking frame, N, actuated by the sweep bar, J, and operating the gate, M, to open and close alternately the aperture, e, in the feeding box, E, of my improved machine, substantially as herein set forth.

82,035.—BIN FOR SUGARS, ETC. — Morgan L. Rich, Sand Bank, N. Y.

I claim the bin, constructed as described, consisting of the radial portions, C, around the standard, B all inclosed within the case, having inclined sides a2, and hinged doors, a1, the latter adapted to close against the edge of the top, D, which forms a scale support, as herein shown and described.

82,036.—HAY AND COTTON PRESS.—James Robertson, Gosport, Ind.

I claim the combination of the press beam, A, rollers, B B, connecting beam, C C lever, D, winch an axle, G, and rope connecting the axle, the lever, D, and the beam, A said parts being arranged in relation to one another substantially as described.

82,037.—BRICK MOLD.—William Saugster and John Bretz, Springfield, Ill.

We claim the combination of the frame bars, B, with the bars, D, pivoted thereto, supporting the partitions, C, with the slotted mold box, A, handles, E, and ledges, F, all constructed in the manner described and for the purposes set forth.

82,038.—MEDICAL COMPOUND.—Irving W. Scranton, West Liberty, Iowa.

I claim the above improved compound for the treatment of cholera in any of its stages.

81,039.—CORN SHELLER AND CLEANER.—Nicholas Shock, Baltimore, Md.

I claim, 1st, the combination of the serrated disks, F F, and feed spout, G, substantially as shown and described.

2d, The combination of the toothed disk, C, the revolving apron, m, and chute board, n, all as shown and described.

3d, The combination of the chute board, n, the elevator, and the spout, t, substantially as shown and described.

4th, The combination of toothed disk, C, and the chute board, n, substantially as shown and described.

82,040.—HORSE RAKE.—Francis Smith, Highgate, Vt.

I claim the lever, H, belt, I, pulleys, F and G, bar, b', arms, c', and rake teeth, L, in combination with the pivoted bar, L, bar, N, and fingers, p', all constructed, arranged, and operated in the manner and for the purpose set forth.

82,041.—BIT STOCK.—Robt. D. O. Smith, Washington, D. C.

I claim a bit stock with the jaws, D D, having a parallel movement, and sleeve, C, or the equivalents of these parts, constructed so as to hold the bit truly centered by seizing it by the cylindrical portion in front of the head thereof.

82,042.—DEVICE FOR TURNING SHAFTING.—Norman C. Stiles, Meriden, Conn.

I claim, 1st, The plate, A, and cutters B1 B2 B3.

2d, The arrangement of the centering device, the cutters, and the milling tool, substantially as and for the purpose herein described.

82,043.—POTATO PLOW.—Michael Stoll, Conestoga township, assignor to himself, Benjamin Snavely, and Anthony Isse, Lancaster, Pa.

I claim the arrangement and construction of my shovels, 1 2 and 3, with their respective beams, slots, screw bolts, b, and countersunk segment, G, and adjustable bearings, E, in combination, with or without the separate center piece, A, fig. 2, all made in the manner and for the purpose specified.

82,044.—BIT STOCK.—O. H. Taylor, Brooklyn, N. Y., assignor to Wm. E. Parish, New York city.

I claim the socket, A, contracted at one side, and adapted for the reception of a shank of a tool which may be secured in the stock by a screw, or its equivalent, so applied as to force the shank into the contracted portion of the socket, substantially as described.

82,045.—METHOD OF FASTENING HAMES.—W. S. Thompson and R. Vincent Love, Montgomery, Ala.

We claim the bar, A, latch B, hook D, and button, c, constructed, operating, and arranged substantially as and for the purpose set forth.

Also, the dovetail, d, in combination with the bar, A, and latch, B, constructed and arranged substantially as and for the purpose described.

Also, the hook, B, when arranged with the eyes, f f f, and in combination with the bar, A, and latch, B, substantially as and for the purpose described.

82,046.—MEDICAL COMPOUND.—Thomas H. Upshur, M. D., Norfork, Va.

I claim a medicine for piles, compounded of the ingredients, in the manner, and substantially of the proportions herein specified.

82,047.—SAW FILING MACHINE.—James H. Van Nortwick, Sturgis, Mich.

I claim, 1st, The combination of cam, G, secured to the shaft, D, arm, H, levers, I I, connecting rod, d, pawl, f, and spring, e, all constructed as described, and operating for the purpose of turning the feed screw, M, by means of the driving wheel, K, thereby moving the carriage, N, substantially as herein set forth.

2d, The arrangement of the shaft, D, movable collar, k, wheels, O P and R, in combination with the pitman, m, and walking beam, n, all constructed as described, for the purpose of moving the file handle, S, back and forth, substantially as herein set forth.

3d, The combination of the movable plate, T, carriage, and screw, U, to turn the file at any angle desired, substantially as herein set forth.

4th, The arrangement of the file handle, S, connected with the walking beam, n, and provided with the spring, p, constructed and operating substantially as and for the purposes herein set forth.

5th, The arrangement of the frame, A, clamps, C C, shaft, D, feed screw, M, and carriage, N, all with their different parts constructed as described and operating substantially as and for the purposes herein set forth.

82,048.—BUTTER PAIL.—Henry P. Westcott (assignor to Seneca Falls Churn Manufacturing Company), Seneca Falls, N. Y.

I claim the metallic ear, C, socketed as described, to contain the bar E, in combination with the said bar, and ear, B, with inward projections, as described.

82,049.—SELF-BALANCING CENTRIFUGAL MACHINE.—David M. Weston, Boston Mass.

I claim, 1st, The application of the easily-yielding spring, e, as the sole support of a centrifugal machine revolving upon an upright shaft resting upon a pivot bearing at the base, and in combination with the shaft and pivot bearing, substantially as above described

2d, The flexible spring, e, in combination with the upright shaft, b, made of sufficient length to prevent the natural oscillation of the machine at an obtuse angle, substantially as described.

3d, The pulley, c, affixed to the shaft, b, below the floor or platform, i, so that the driving power of the machine is wholly applied below the floor.

82,050.—HARVESTER REEL AND RAKE.—Wm. N. Whitely, Springfield, Ohio.

I claim, 1st, The rake head H, with the arms, G G, and with a long tube bearing for the joint bolt, in the manner described, independent of the wooden arm, F.

2d, Attaching the friction roller, N, to the cast rake head, H, by means of a wrought bolt, one end of which forms the journal or bearing of said roller and the other penetrates through said head, and is secured therein by a screw nut, or the equivalent thereof.

3d, The pendent stud, M, with a tapered socket for the correspondingly shaped bolt, O, which attaches the friction roller to the head, H, as set forth and described.

82,051.—LAMP.—Abel Whitlock, Danbury, Conn.

I claim a lamp pot constructed with the interior chamber, B, said chamber communicating with the reservoir, A, by an orifice, E, which may be closed with a suitable valve while the reservoir is being replenished, in combination with valves, G and I, substantially as shown and set forth.

82,052.—FLOWER POT.—Ephraim Whitman, Fitchburg, Mass.

I claim a flower pot made with inner and outer walls, a b, and an intervening water space, c, the walls, a b, being connected or relatively fixed in position, substantially as shown and described.

Also, in combination with the water chamber, c, the cap ring, i, substantially as shown and described.

82,053.—WINDOW SCREEN.—R. S. Whittier, Dorchester, Mass.

I claim, 1st, The combination and arrangement of the shaft, B, bushings, C and D, disk, F, and spring, E, with the body, A, of the roll, in the manner and for the purpose specified.

2d, The plate, a, provided with a concave bearing, in combination with the square ended shaft, B, and its connections, and with the case, G, for the purpose and substantially as described.

3d, The plate, b, provided with a slot, p, when used in combination with the roll, , and with the case, G, and the screen, S, for the purpose and substantially as described.

4th, The curved spring plates, d, slotted as shown and described, in combination with the case, G, and the screws, c, or holding devices, which connect the case and the roll with the sash, as described.

5th, The slotted plates, f, constructed as described, in combination with the bar, H, and the screws, e, for the purpose and substantially as described.

6th, The combination with the sash, K, of a case, G, constructed as described, the case serving as a cover and protection to the roll and the screen and also as a device for detaching the bar, H, and the screen from the sill, for the purpose and substantially as described.

7th, The arrangement and combination of the roll, screen, and case, and the supporting plates, with the sash, and the bar, H, with the sill, M, so that the screen shall move perfectly over the open space produced by raising the sash, as and for the purpose set forth.

82,054.—SPUR WHEEL.—C. F. Woodruff, Newbern, Tenn.

I claim, 1st, The series of cogs, M, the rim, A, shoulders, m m, and pins, e, constructed and arranged substantially as described.

2d, The spokes, N N, when formed with the trifurcated end, n n' n, substantially as described.

3d, The combination of the trifurcated spokes, N N, with the projecting ends, B B, of the elongated cogs, substantially as described.

82,055.—MOP.—John A. Wright, Keene, N. H.

I claim a sliding and revolving handle, A, with its projection, e, and screw thread, d, in combination with the jaws, B C, one or both of which are provided with a screw thread, b, substantially as and for the purpose set forth.

Also, a mop cloth sewed substantially as described, to insure the projections, e, catching into and retaining the cloth when it is to be twisted for the purpose of being wrung out.

82,056.—EXERCISING CHAIR.—J. A. Wroe, Hagerstown, Md.

I claim a vibratory and exercising chair when the same is constructed with hollow back, seat, arms, and foot board, and is so supported upon pivots or rockers that the chair can be readily operated by means of springs, or their equivalents, substantially as described, as and for the purpose specified.

82,057.—VALVE FOR WATER CLOSETS.—David Morrison, New York city.

I claim, 1st, The plunger, D, valve, J, and hollow spindle, D, with its groove c, substantially as shown and described.

2d, The combination of the rod, K, valves, M and N, double valve seat, I, plunger, D, and spindle, F, when arranged and operated substantially in the manner shown and described.

REISSUES.

59,402.—MANUFACTURE OF RUBBER COATED LEATHER.—Dated Nov. 6, 1866; reissue 3,112.—J. J. Fields and A. H. Klug, New York city, assignees by mesne assignments of Henry W. Joslin.

I claim, 1st, Leather coated with india-rubber or gutta-percha, in the manner substantially as herein set forth.

2d, Applying the rubber to the surface of the leather in a raw state, and curing it conjoint on the same, as specified.

65,202.—PROPELLER.—Dated May 28, 1867; reissue 3,113.—F. G. Fowler, Springfield, Ill.

I claim, 1st, The blades, a'', constructed, arranged, and operating substantially as and for the purposes herein shown and described.

2d, The eccentric, e, with its band, and the rods, e', arranged and operating substantially in the manner and for the purposes set forth.

3d, The removable eccentric, e, applied to steering purposes, and arranged in the manner and for the purpose set forth.

4th, The sleeve, E, chain wheels, r and r'', chain, r', and shaft, s, or their equivalents, when used substantially as and for the purpose described.

5th, A propeller constructed of the parts above described, arranged and operating as a combined steering wheel and propeller, substantially as set forth.

20,647.—GANG PLOW.—Dated June 22, 1858; reissue 3,114.—Don Carlos Matteson, Stockton, Cal.

I claim the arrangement as described of the false beam, N, goose neck, G, axle, u, lever, I, catch, L, and the system of plows attached to their frame, as set forth, the whole being constructed and operating substantially as and for the purposes specified.

14,245.—SEALING PRESERVE CANS.—Dated Feb. 12, 1856; reissue 3,115.—S. B. Rowley, Philadelphia, Pa., assignee of R. W. Lewis.

I claim, 1st, A preserve can or jar having a plate intervening between the gum packing, and a cover, or its equivalent, for compressing the packing to its seat on the jar.

2d, The plate or its equivalent, situated below the packing, and filling the throat of the jar, as set forth, for the purpose specified.

3d, Ribs, H, or recesses on the jar, in combination with notches or projections on the plate above the packing, for the purpose specified.

EXTENSIONS.

MOLDS FOR CEMENT OR EARTHEN TUBES.—Bradford S. Pierce, and Charles M. Pierce, of New Bedford, Mass.—Letters Patent No. 11,440, dated August 1, 1854.

We claim the combination of a core and spring case, substantially as herein set forth.

CULTIVATOR.—Daniel W. Shares, Hamden, Conn.—Letters Patent No. 11,469, dated August 1, 1854.

I claim providing the expanding and contracting hoeing wings B, on either side with cultivator teeth, C, projecting downward on the inside of the hoeing wings or scrapers, as and for the purposes specified.

PLOWS.—Joshua Gibbs, Canton, Ohio.—Letters Patent No. 11,523, dated August 15, 1854.

I claim making the working surface of the mold board in the form of a section of the interior surface of a hollow cylinder, the center or axis of said cylinder being parallel, or nearly parallel, horizontally to the base of the mold board or bottom of the plow substantially as described.

MACHINE FOR PLANING LUMBER OUT OF WIND.—Solomon S. Gray, Boston, Mass. Letters Patent No. 11,582, dated August 22, 1854; reissue No 945, dated April 17, 1860.

I claim, 1st, The peculiar construction of cutter head herein described, the cutter head itself being made use of to turn and break the shaving, in the manner of a double iron plane, and being furthermore made concave for the purpose of facilitating this operation.

2d, The clamp, as herein described, for the purpose of dogging the lumber to the bed of the machine, the body of the clamp being pivoted at d, and forced up by the screw, F, or its equivalent, the dog, n, being adjustable therein, in the manner and for the purpose set forth.

3d, The within described method of securing the dog, M, to the bed of the machine by means of the teeth or cogs, l, and the mortises in the side pieces m, for the purposes set forth.

4th, I claim the bar, D, or its equivalent, in combination with a rotary cutter head and traveling bed, I, provided with suitable dogs for planing straight and out of wind, substantially as set forth.

SEWING MACHINE.—Sidney S. Turner, Westboro, Mass. Letters Patent No. 11,588, dated August 22, 1854; reissue No. 363, dated March 25, 1856; again reissued No. 1,932, dated May 16, 1865.

I claim the combination, in a sewing machine, of an automatic feed, a work supporting surface, and a needle, when the needle is arranged to operate from below the table or work supporting surface, and without the cooperation of a second thread (or a device carrying a second thread) above the table or work supporting surface.

Also the combination together, of a needle and awl, when the same enter the work in opposite directions, and each withdraws in a direction opposite that from which it entered.

Also, the combination, in a sewing mechanism, of an automatic needle turner and automatic feed, by which the loop is kept in proper position with respect to the needle as the work progresses.

Also, the method of effecting the rotation of the hook, substantially as specified

CARDING MACHINE.—Horatio N. Gambrill, of Baltimore, Md., and Thomas D. Bond, of Washington, D. C., administrator of Singleton F. Burgee, deceased.—Letters Patent No. 12,469, dated February 27, 1855; antedated August 22 1854; reissue No. 569, dated November 17, 1857.

We claim the application of two or more sets or pairs of feeding rollers to the working cylinder of carding engines, substantially in the manner and for the purpose set forth, and this we claim whether said feed rollers deliver the material directly on to the main cylinder or to lickers-in, when said lickers-in are so arranged as to work in connection with each other and with the main cylinder, for the purpose and in the manner substantially as set forth.

We also claim the reversing of the relative velocities of the peripheries of the main working cylinder and stripper, M, at intervals, by an automatic movement for the purpose of cleaning or preventing the clogging of the main cylinder, substantially as described.

MACHINE FOR GRADUATING CARPENTERS' SQUARES.—Norman Millington, of Shaftesbury, Vt., and L. J. Mattison, S. M. George, and A. B. Gardner, of the same place, executors of Dennis J. George, deceased.—Letters Patent No. 11,489, dated August 8, 1854.

We claim, 1st, The arrangement in a single frame, substantially as set forth, of as many gravers as there are units to be divided, so as, by the action of the cam wheel, W, or its equivalent, simultaneously to trace, of the proper length, each set of division and fractional lines.

2d, The balance frame, V, with its appendages, to equalize the pressure of the spiral springs on the graver handles, c, so as to give the same depth of mark on the thin as well as the thick end of the taper square.

3d, The inclined plane, i, with its appendages for moving the square longitudinally, and dividing the inch into any desirable number of . . . . equal parts.

4th, The carriage, C, arranged to press the square up against the points of the gravers by a cam, or otherwise, all of the several parts, or their equivalents to be arranged and combined as above specified, or in any other manner substantially the same which shall produce the intended effect.

CENTRIFUGAL PUMP.—William O. Andrews, New York city. Letters Patent No. 11,544, dated August 22, 1854.

I claim the construction of the pump as herein described and shown, viz., having a tub, E, in the shape of the base of a cone inverted, with arms, a, attached to its periphery, of a gradually-decreasing width as they approach its base, placed within a shell corresponding in shape to the outer circumference of the arms, and having induction passages of a spiral form, gradually decreasing in pitch to their point of delivery, and eduction passages of a spiral form, of a gradually-increasing pitch until they attain a straight line, by which construction the water is made to pass, without sudden change of direction or eddies, in an unbroken volume through the pump; and I do not limit myself to the precise mechanical construction as shown, but may modify the different parts, only retaining the same general combination.

MACHINE FOR CASTING METALLIC EYES OR MAILS OF HEDDLES FOR LOOMS.—Jacob Sennett, of Philadelphia, Pa. Letters Patent No. 11,599, dated August 22, 1854.

I claim, 1st, The method, within described, of casting the eyes or mails on the strands of yarn or other material, by inserting the yarns successively within a mold secured on a vibrating frame, L, operated at the proper intervals of time by means of the eccentric cams, I I, said cams being opened at times to disengage the mail therefrom, and provided with a core, 34, for forming the eye in the mail, and capable of being withdrawn therefrom before the mold opens, substantially in the manner and for the purpose herein set forth.

2d, The manner of operating the core, so as to enable it to be so withdrawn from the eye of the mail after the same is formed, and while it is firmly embraced within the mold, by means of the springs, S, and screws, 35 and 35, operating in the manner described.

3d, The core carrier, 37, resting in a notch formed in the top of the spring, S, and having pins, 36, on its face, when passing through slots in the mold plates and spring, W, for moving the core horizontally from the stationary half of the mold, and keeping it midway between the mold plates, when they are opened by the lever, T, and preventing it being thrown violently either way, as herein set forth.

4th, The manner of operating the heddle frame holder, D, by means of the eccentric cams, I, on the shaft, B, capable of being moved longitudinally over the grooves in said shaft, right-angled levers D, to which the heddle-frame is secured, and spiral springs, 21, for keeping the ends of the levers always in contact with the eccentric cams; and, in combination therewith, I claim the screw shaft, C, and clamps, J, and the adjustable gearing, K, at the ends of the screw and main driving shafts, the whole being constructed and operating in the manner and for the purpose herein fully set forth.

PACKING FOR STUFFING BOXES, ETC.—Jos. H. Tuck, Broklyn, N. Y.—Letters Patent No. 13,145, dated June 26 1855; patented in England, August 25, 1854.

I claim the forming of packing for pistons or stuffing boxes of steam engines, and for like purposes, out of saturated canvas, so cut as that the thread or warp shall run in a diagonal direction from the line or center of the roll of packing, and rolled into form either in connection with the india-rubber core or other elastic material, or without, as herein set forth.

GOVERNOR OF WINDMILLS.—Daniel Halladay, Batavia, Ill.—Letters Patent No. 11,629, dated August 29, 1854.

I claim attaching the spindles, h, of the wings or sails, F, to a sliding head, G, by means of the levers, f h, or their equivalents, and operating said head, G, by means of the lever, H, or its equivalent, and a governor of any proper construction, for the purpose of giving the desired obliquity to the wings or sails, and thereby insuring an equal motion and power during the variable velocity of the wind.

LEATHER-SPLITTING MACHINE.—Sarah W. Flanders, Newburyport, Mass., administratrix of Joseph F. Flanders, deceased, and Jeremiah A. Marden, Boston, Mass.—Letters Patent No. 11,604, dated August 29, 1854.

We claim the use of the continuously revolving or endless belt knife, as applied to machines for splitting leather, and operating in the manner substantially as set forth.

MANUFACTURE OF INDIA-RUBBER.—Caleb Swan, Easton, Mass., executor of Daniel Hayward, deceased.—Letters Patent No. 11,808, dated August 29, 1854.

I claim the improvement in the process of vulcanizing native india-rubber, or rubber once vulcanized compounded with other articles, as above set forth, which consists in heating and curing them with steam, and under pressure, and in regulating the application of steam, and the induration of the product by the introduction of steam and water, as described, by which a very great saving is made in the time and fuel required for the process, as hereinabove stated.

Inventions Patented in England by Americans.

(Compiled from the "Journal of the Commissioners of Patents.")

PROVISIONAL PROTECTION FOR SIX MONTHS.

2,395.—FLAME SPREADER AND AERATOR FOR GAS AND OTHER BURNERS.—Joseph S. Machir, Washington, D. C. July 30, 1868.

2,396.—DISTILLATION, AND MEANS AND APPARATUS EMPLOYED THEREIN.—Thos. Prosser, New York city. July 30, 1868.

2,400.—MANUFACTURE OF AND REPAIRING RAILWAY RAILS.—Hugh Baines, Toronto, Canada. July 30, 1868.

2,404.—SUBSTITUTE FOR INDIA RUBBER.—A. G. Day, Seymour, Conn. July 31, 1868.

2,422.—MACHINERY FOR MANUFACTURING METALLIC EYELETS.—Wm. R. Lancfear, Hartford, Conn. Aug. 1, 1868.

2,465.—FELTED FABRICS.—Henry Hayward, New York city. Aug. 6, 1868.

2,473.—SEWING MACHINE.—Benj. P. Howe, New York city. Aug. 7, 1868.

1,821.—DECORATING WALLS, ETC.—Wm. Howell, Philadelphia, Pa. June 3, 1868.

2,444.—HARVESTING MACHINE.—George Harding, Philadelphia, Pa. Aug. 4, 1868.

2,448.—BOOT AND SHOE SEWING MACHINE.—Michael J. Stein, New York city. Aug. 4, 1868.

2,453.—MANUFACTURE OF IRON AND STEEL.—Lorenzo Sibert, Mount Solon; D. C. & Brady, Buffalo Forge; and John D. Imboden and Seth M. Barton, Richmond, Va. Aug. 5, 1868.

2,458.—INDICATOR AND SAFETY VALVE FOR STEAM BOILERS.—Chas. Bailey, Cincinnati, Ohio. Aug. 6, 1868.

2,466.—BOOTS AND SHOES.—John M. Hunter, Morristown, N. J. Aug. 6, 1868.

2,471.—INDIA RUBBER FABRIC.—John Haskins, Boston, Mass. Aug. 7, 1868.

2,478.—FIRE-ARM.—Wm. Gardner, Toledo, Ohio. Aug. 7, 1868.

2,485.—STEAM ENGINE GOVERNOR.—Edwin L. Bomeisler, Philadelphia, Pa. Aug. 8, 1868.

2,486.—SCREW AND SCREWDRIVER.—Peter N. Jacobus, Flatbrookville, N. J. Aug. 8, 1868.

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U. S PATENT OFFICE, WASHINGTON, D. C., Sept. 7, 1868.

R. F. Brown, Dorchester, Mass., having petitioned for an extension of the patent granted him on the 12th day of December 1854, for an improvement in "Hanging Carriage Bodies."

It is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Sept. 9, 1868.

Sylvanus Sawyer, of Fitchburg, Mass., having petitioned for an extension of the patent granted him on the 12th day of December, 1854, for an improvement in "Rattan Machine," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed at this office twenty days before the day of hearing.

13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, Washington, D. C., Sept. 9th, 1868.

James E. Simpson, of Brooklyn, N. Y., having petitioned for an extension of a patent granted him on the 5th day of December, 1854, for an improvement in "Dry Docks," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, Washington, D. C., Sept. 9, 1868.

Charles Danforth, of Paterson, N. J., having petitioned for the extension of a patent granted him on the 12th day of December, 1854, for an improvement in "Throstles for Spinning Cotton," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., August 27, 1868.

Emeline M. Woodruff (late Emeline M. Stedman), of Elizabeth, N. J., executrix of the estate of Geo. W. Stedman, deceased, having petitioned for an extension of the patent granted to said Geo. W. Stedman the 12th day of December, 1854, and reissued the 26th day of April, 1859, for an improvement in "Sewing Machines," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Sept. 2, 1868.

Birdsill Holly, of Lockport, N. Y., having petitioned for an extension of the patent granted to him on the 6th day of February, 1855, for an improvement in "Elliptical Rotary Pumps," it is ordered that said petition be heard at this office on the 11th day of January next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 28, 1868.

Aaron H. Allen, of Boston Mass., having petitioned for an extension of the patent granted to him on the 5th day of December, 18—, for an improvement in "Seats for Public Buildings," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., August 31, 1868.

Jeremiah Stever, Bristol Conn., having petitioned for an extension of the patent granted him on the 12th day of December, 1854, for an improvement in "Machines for Scraping Metals," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 28, 1868.

John Pepper, of Gilford, N. H., having petitioned for an extension of the patent granted to him on the 5th day of December, 1854, and reissued on the 27th day of October, 1863, for an improvement in "Circular Knitting Machines," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing

12 3 ELISHA FOOTE, Commissioner of Patents

U. S. PATENT OFFICE, Washington, D. C., Sept 4th, 1868.

Samuel N. Miller, of Dedham, Mass., having petitioned for the extension of the patent granted him on the 29th day of June, 1852, for an improvement in "Combined Anchor," this application having been authorized by Act of Congress, approved July 20, 1868, it is ordered that said petition be heard at this office on the 23d day of November next

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, Washington, D. C., Sept. 1st, 1868.

Cyrenus Wheeler, Jr., of Auburn, N. Y., having petitioned for the extension of a patent granted him on the 5th day of December, 1854; reissued Jan. 3, 1860, in seven divisions, numbered 875, 876, 877, 878, 879, 880, 881, and reissue numbered 876, again reissued May 14, 1867, and numbered 2,610, for an improvement in "Grain and Grass Harvesters," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, Washington, D. C., Sept. 1st, 1868.

Cyrenus Wheeler, Jr., of Auburn, N. Y., having petitioned for the extension of a patent granted him the 6th day of Feb. 1855; reissued June 5, 1860, numbered 971, and again reissued May 29, 1867, and numbered 2,633, for an improvement in "Grain and Grass Harvesters," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension, Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug 21, 1868.

James H. Whitney, of Brooklyn, N. Y., administrator of the estate of Theodore E. Weed, deceased, having petitioned for an extension of the patent granted the said Theodore E. Weed on the 28th day of November, 1854, for an improvement in "Sewing Machines," it is ordered that the said petition be heard at this office on the 9th day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 21, 1868.

Whitten E. Kidd, of New York city, having petitioned for an extension of the patent granted him on the 28th day of November, 1854, and reissued the 15th day of January, 1867, for an improvement in "Molds for Pressing Bonnet Fronts," it is ordered that the said petition be heard at this office on the 9th day of November next. Any person may oppose this extension. Objections, depositions and other papers should be filed in this office twenty days before the day of hearing.

11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 3, 1868.

Daniel G. Ambler and Halsted H. Hoeg, of Jacksonville, Fla., administrators of the estate of Daniel C. Ambler, deceased, having petitioned for an extension of the patent granted to the said Daniel C. Ambler on the 7th day of November, 1854, for an improvement in "Sewing Machines," it is ordered that said petition be heard at this office on the 2d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 21, 1868.

T. J. W. Robertson, of Washington, D. C., having petitioned for an extension of the patent granted him on the 28th day of November, 1854, for an improvement in "Sewing Machines," it is ordered that the said petition be heard at this office on the 9th day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

11 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 15, 1868.

Charles Parham, of Philadelphia, Pa., having petitioned for an extension of the patent granted him on the 21st day of November, 1854, and reissued on the 3d day of November, 1863, for an improvement in "Sewing Machines," it is ordered that said petition be heard at this office on the 2d day of November, next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 20, 1868.

George W. Lee, of Winchester, Ohio, having petitioned for an extension of the patent granted him on the 21st day of November, 1854, for an improvement in "Seed Planters," it is ordered that said petition be heard at this office on the 9th day of November next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

11 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE, WASHINGTON, D. C., Aug. 12, 1868.

Eliza Mascher, of Philadelphia, Pa., administratrix of the estate of John F. Mascher, deceased, having petitioned for an extension of the patent granted the said John F. Mascher the 8th day of March, 1853, for an improvement in "Daguerreotype Cases" (this application having been authorized by act of Congress, approved July 27, 1868), it is ordered that the said petition be heard at this office on the 2d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

11 3 ELISHA FOOTE, Commissioner of Patents.

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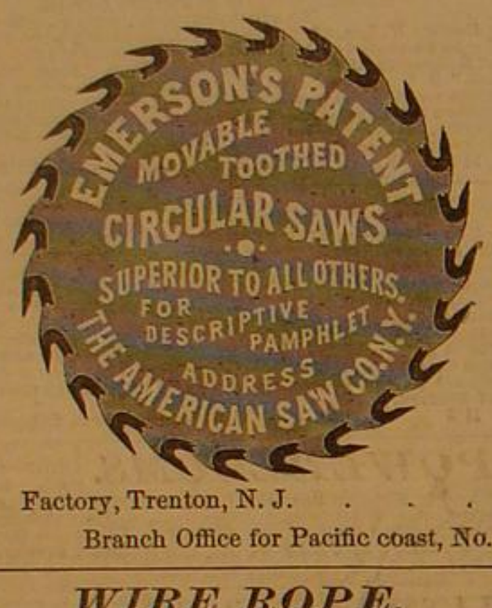

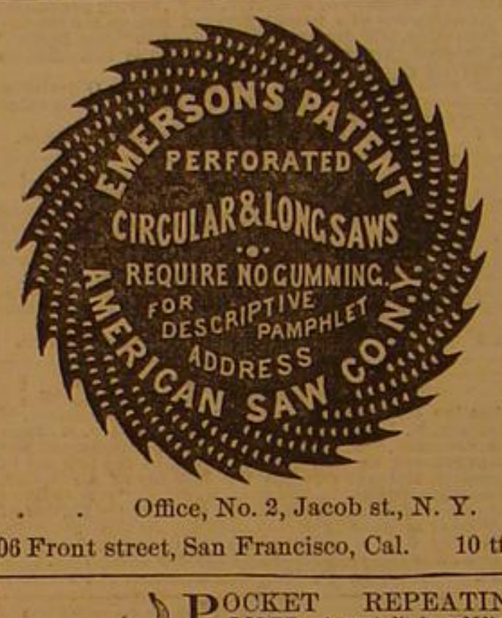

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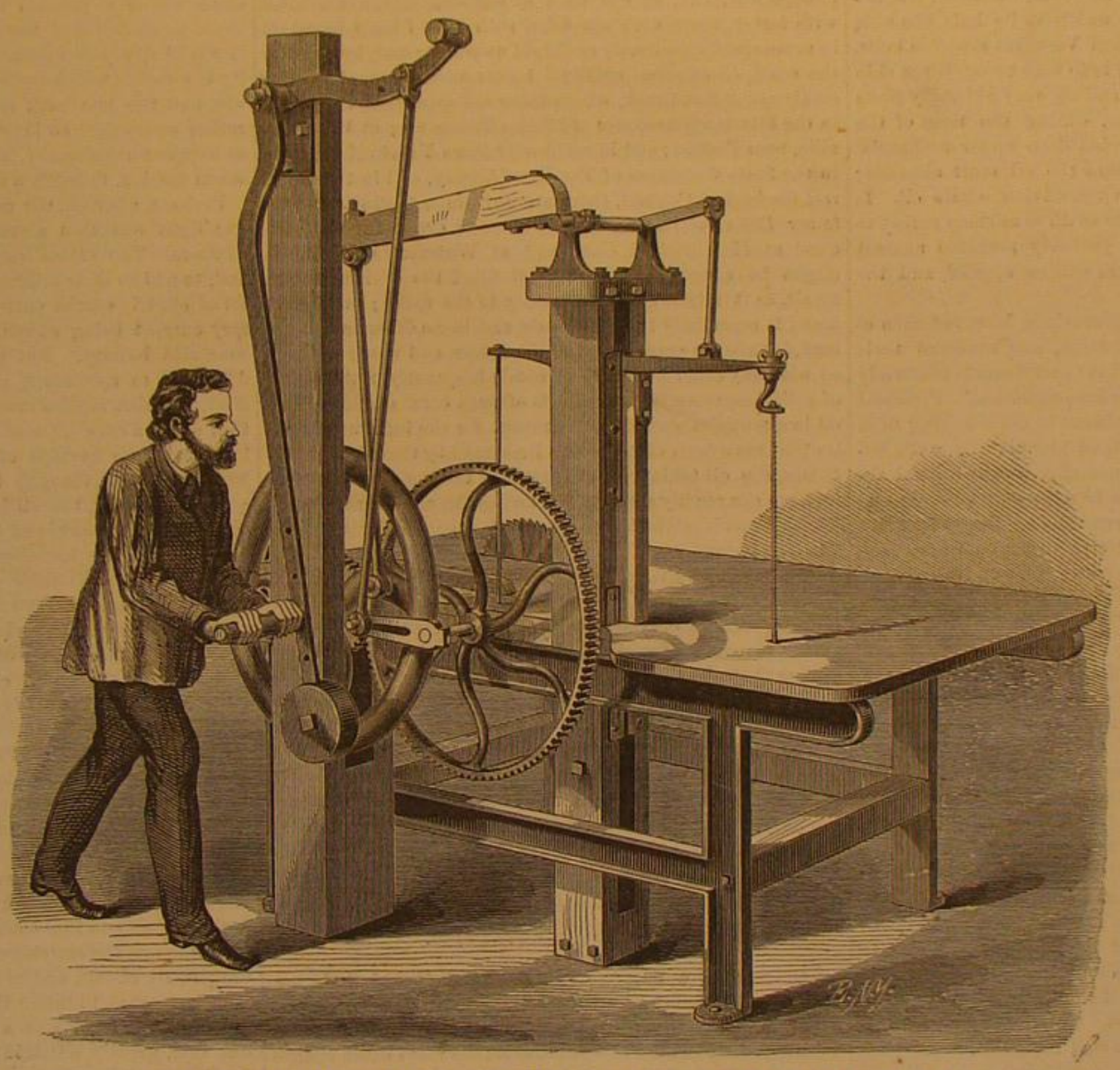
Vol. XIX.—No. 14. [NEW SERIES.] NEW YORK, SEPTEMBER 30, 1868. $3 per Annum. [IN ADVANCE.]

Improvement in Hand-power Sawing Machines.

In the science and the practice of mechanics there are well-known devices, which are employed as reservoirs of power, sometimes, however, mistaken by embryo mechanics, and by theoretical mechanics and amateurs, as producers rather than storers of power. Such are adjustable and automatically moving weights, the swing of the pendulum, the continued rotation of the balance wheel when once put in motion, and other similar devices. These contrivances for sustaining power have not unfrequently been considered reservoirs or producers of power *per se*, when the fact is well known that one cannot expect from any mechanical combination more ultimate and executive power than that imparted to the prime mover less the friction, etc. Still, there is a "balance of power" to be considered in mechanics as well as in politics, and he who so well divides the prime or first exerted power with the means of utilizing that power to the greatest advantage proves himself truly a mechanic. The machine shown in the accompanying engraving is a beautiful illustration of the adaptation of means to an end. It is a hand-sawing machine carrying a circular and a reciprocating or gig saw, which may both be run at the same time by the power of one man, or even of a boy, or either may be detached while the other is used. The power is applied, as seen, by means of a long pendulum lever swung back and forth, and having attached to its short arm at the top, a pitman connected at its other end with a wrist pin on a balanced gear. This gear meshes with a pinion on the saw arbor, which also carries a balance wheel intended to equalize the motion.



HASSENPFLUG'S HAND CIRCULAR AND RECIPROCATING SAW.

To the upright portion of the frame is pivoted a lever intended to drive the gig saw, the frame of which is similar to those in ordinary use, being two crossheads connected together by rods and braces, and moving in suitable slides in the upright. A bar extends longitudinally with the table from the upper crosshead, carrying at one end the gig saw and at the other a guide, passing through the table and guided by a box under the table bed. The connection between the reciprocating saw and the power is by means of a pitman, one end of which is pivoted to the lever before mentioned, and the other to a crank on the fly wheel.

These are the principal parts of the machine, which is very simple and not liable to become deranged. If only one man operates the machine where little power is required, as in running the gig saw alone, a treadle is attached to the saw frame on the lower crosshead by which the saw can be driven. A treadle can also be connected to the other end for driving the circular saw, its pitman being attached to the crank of the fly wheel. Either of these may be instantly unhooked, when two are at work, one propelling the saws by the pendulum lever, and the other guiding the stuff to be sawed. Or, one may work at the gig saw, and another at the circular saw by means of the treadles, each independent of the other.

The ease of running the machine, and the rapidity of its work are truly surprising. On a trial with a full-sized machine we ran both saws by means of the pendulum, with one hand, while two workmen drove both saws through hard seasoned elm planks four inches thick. We regard it as one of the most useful and valuable machines that have come under our notice. Patented June 11, 1867, by Henry Hassenpflug, assignor to himself and Edward Hassenpflug, Huntington, Pa. The machine is on exhibition at 94 Bowery, New York. Address Hassenpflug Brothers at this No., or at Bradford Place, Roxbury, Mass. See advertisement.

The Hoosac Tunnel.

We copy the following interesting account of a visit to the famous Hoosac Tunnel from the columns of the Hartford (Conn.) *Courant:* —

"The depot of the Troy and Greenfield railroad is three fourths of a mile from the east end of the tunnel. Here new and well finished six-horse coaches take the passengers over the mountain to North Adams, a delightful ride of nine miles, affording extensive and charming prospects. The drivers, coaches, and horses have been brought down from the White Mountain routes, where staging is as near perfect as it can be made, and the ride is as pleasant and romantic as many of the rides in that locality. It is claimed, that even with the nine miles of staging, better time can be made from Boston to the Hudson River than over the heavy grades and windings of the Western Road. Taking into consideration the romance of the mountain ride, the route will very likely become popular as it becomes better known.

"Those who are ambitious to thoroughly inspect the work at the tunnel, should stop over a day, and enter it at the eastern portal, first taking a look through the machine shops. On the east side, the mountain has been penetrated nearly one mile, though the enlargement of the tunnel to the full size necessary for the passage of trains is less than one half that distance. If one undertakes to walk into the mountain to the heading, he will have an ardent admiration of the perseverance and pluck necessary to accomplish the work which has already been done, before he has accomplished half the journey; but he will find no variety in the scenery to charm him. Solid rock was struck at the east side almost at the first blow, and the penetration of one mile has been through the toughest granite. The central shaft, from the top of the mountain, half way over, was sunk to a depth of 583 feet, when the terrible accident, last year, buried fourteen workmen in the shaft, and the deep cavern being filled with falling timbers and water, work was suspended. Machinery is now being put up to clear the shaft, when the work of sinking it to the tunnel level will be proceeded with. This shaft is elliptical, 27 by 15 feet in size, and is to be sunk to a depth of 1030 feet, when work upon the tunnel each way can be prosecuted from this point.

"The west shaft is the most interesting point to visit. From the west portal, a distance of about 700 feet has been completed, through quicksands, and 'demoralized rock,' and mountain springs, and the tunnel is of the required size, 24 feet wide and 10 feet high, large enough for a double track, and is arched with brick. At the west shaft, a half mile east of the portal, your correspondent found a collection of buildings containing engines, pumps, machinery; and everything in the surroundings showed the systematic progress of a great work. Entering one of the buildings, we looked down the shaft. Out of it came rushing a volume of steam, so that the eye could not penetrate through the misty atmosphere more than ten or fifteen feet. Up and down in this shaft go the laborers, hoisted or let down by alternate buckets or dummies, which also bring up the stone which is loosened by the glycerin blasts.

"It required some nerve to visit the depths below, the entrance to which looked like the opening of the doors of Hades, and as the thick steam rolled out, it was easy to imagine that it smelled of brimstone. Accepting the offer of rubber clothing, from hat to boots, and supplied with a well-trimmed lamp, your correspondent and an adventurous traveling companion prepared to descend. We called to mind the fact that men were constantly going into the depths, and returning safely, and putting confidence in a wire rope an inch in diameter, we jumped into the dripping, dirty, car, the signal was struck, and down, down, into the steaming dark abyss we were speedily plunged. The sensation, as one goes down, shut out from the light of the sun, and hearing the dull, heavy thud of the mammoth pumps, which throw out the accumulating water, is hard to describe. The mighty pulse of the mountain seems to be throbbing, and one listens, as if expecting some grand upheaving to punish man for his temerity in attempting to invade the realm of the inhabitants of the lower depths. Soon we touch bottom, and, alighting, trust to our feeble lights to explore the terrible darkness. Fifteen hundred feet away, into the bowels of the mountain, men are working with sledge and drill, each with a light; but we see them not through the inky darkness, and the sound of their steady strokes falls dead against the rocky ribs of the cavern long before it reaches us. We find ourselves surrounded by no fairy forms, and in no beautiful grotto, like the pictures in fairy tales; but in a rock-ribbed and arched cavern, where no sound of ordinary life reaches us. The air is fresh and good, being forced down from above through long pipes by powerful compressors, and the temperature is as grateful to the person on a hot August day as that of a refrigerator to a piece of melting butter. The exhibition of man's patient, persistent work, delving through fifteen hundred feet of rock to the eastward and over one thousand to the westward, excites one to poetical thoughts. But our poem on 'Pluck,' inspired in the cavernous depths, but never committed to paper, we wont ask you to print. We only advise a visit to the spot, where the working of the pneumatic drills into the rocky face, the patient blows of the sturdy miners, the systematic toil toward the accomplishment of this great enterprise, will excite thoughts which it is well worth a short exile from sunlight to experience. At all the working faces the toil goes on without cessation, night or day, except Sundays; and then the engineers take possession of the tunnel to accurately observe the progress and pursue the calculations which are, with unerring certainty, to bring the working forces together midway under the mountain. There are three gangs at each face, who work eight hours each; and it is calculated to put in and explode a glycerin blast during each eight hours, the drills penetrating the rock about three feet at each drilling. The workmen are Irish, French, and English; and their wages are $1 75 per day for ordinary laborers, and $2 25 for miners. Those who work regularly their eight hours daily in the tunnel are strong and healthy, but those who are in and out frequently, from the sun's heat to the earth's cold dampness, and *vice versa*, often suffer from rheumatism.

"From each end the tunnel is worked on an up grade of 26 feet to the mile, the grade to be continued to the point of meeting at the central shaft. When completed it is calculated that this shaft, 27 by 15 feet, will comprise a monster chimney, which will keep the air of the tunnel pure, and clear it quickly of the smoke of passing engines.

"Under the track is to be a central drain to draw off the accumulating water. Already a stream runs from the west-

ern portal sufficient to make a good mill privilege. Some Yankee will utilize this power, no doubt, when the work is completed.

"Altogether, the mountain has been penetrated, at all the workings, about one and three fourths miles. The entire length of the tunnel being four and three fourths, there are yet three miles to penetrate. It will be too bad if the work is ever given up after so much has been accomplished. The trouble now seems to be in satisfactorily adjusting the contracts for completing the work with the $5,000,000 appropriation. The friends of the project very sensibly desire to divide the work into small contracts, and the Commissioners have advertised for proposals under this plan. The opponents of the tunnel argue for one contractor, believing, no doubt, that no one man can be found who will take so large a risk, and be able to give satisfactory security for the completion of the work. They hope the $5,000,000 appropriation will fall by its own weight. But Massachusetts cannot afford to turn back from this great enterprise."

THE ORIGIN OF PETROLEUM.

Denton, in his popular lectures on Geology, entitled, "Our Planet, its Past and Future," after making some remarks upon ancient sources of rock-oil, etc., thus speaks of the original causes of these deposits:

"This is, then, no new thing; but whence comes it? And in answer to this question we have many theories, some of them sufficiently ludicrous. One suggests that, since the earth is a huge animal, the rocks its bones, the water circulation in them its blood, the grass and trees its hair, the hills pimples upon its face, and Ætna and Vesuvius eruptive boils, all that is necessary to obtain oil is to bore through the skin into the blubber of the monster, and oil very naturally flows from it. Another supposes, that, during the time of the flood, the great whales were buried deep under accumulations of mud, in those places where the oil most abounds; and hence petroleum is merely antediluvian whale oil. It has been suggested, that, since the earth is at some period to be destroyed by fire, the oil was probably prepared against that terrible day when the match will be applied, and the world burned up.

"Apart from these ludicrous explanations, however, men of science have considered this question, and rendered their verdict. Professor Silliman says that 'petroleum is uniformly regarded as a product of vegetable decomposition.' Professor Dana says, 'Petroleum is a bituminous liquid resulting from the decomposition of marine or land plants (mainly the latter), and perhaps, also, of some non-nitrogenous animal tissues.' By many, it is supposed to be a product of coal; and hence the name of 'coal oil,' so frequently applied to it. Some suppose that the coal, being subjected to the enormous pressure of the overlying beds, has yielded oil, as a linseed-cake does under an hydraulic press; and I have seen the theory advanced, that the coal, heated (as it evidently has been in the coal regions of Eastern Pennsylvania), gave off oily vapors which, rising to the cold region of the upper air, condensed, and subsequently fell in oily showers, making its way as best it could to the hollows of the earth's interior, where the oil-borer finds it to-day.

"Facts play sad havoc with these various theories. If the oil comes from coal, it seems strange that it is so rarely met with in a coal district. I have visited coal mines in England, Wales, Nova Scotia, Cape Breton, and not less than ten of the United States, but never saw petroleum in a coal mine, or even smelt it; and this is an article that never waits for an introduction, but salutes the olfactories at once. Of course, if this came from coal, coal mines would be the places in which to discover it; coal neighborhoods should abound with it, coal miners be familiar with it; and it should never be found in rocks older than the coal measures. The contrary of all this is true. When it is found in the coal measures, it has been forced up from underlying beds in which it was originally contained.

"In this country, nearly all the oil hitherto obtained has been from beds that lie below the coal measures, and sometimes at a great depth below them. On Oil Creek, in Pennsylvania, it is found by boring in shales and sandstones, sometimes to a depth of a thousand feet; these beds belonging to the Chemung group of the Devonian formation, and many hundred feet below the coal measures. At Enniskillen, in Canada West, where the oil has at one time come up in springs, and overflowed, leaving a thick bed of asphaltum covering the ground for an acre, the limestone in which borings are made contains characteristic fossils of the Hamilton group of the Devonian formation. The oil wells in Western Kentucky, and in some parts of Tennessee, are in the Trenton limestone,—that is, in the lower Silurian formation; and I have seen oil even at the base of this. The same oil floats on the surface of a limestone quarry near Chicago, the limestone belonging to the Niagara group of the Silurian formation; showing conclusively that it has no necessary connection with coal.

"But may it not have been produced from sea plants, as coal has been from land plants, as several eminent geologists have supposed? The quantity of free oil existing in the earth seems to forbid this. I saw a well in Western Virginia which produced twenty-eight thousand barrels in ten months. From three wells near Oil Creek, one thousand barrels spouted in twenty-four hours; and from one, three thousand seven hundred and forty. The 'Big Phillips' Well struck oil in October, 1861, at a depth of four hundred and eighty feet. It yielded about three thousand barrels a day. The oil rushed out with such violence, that the well could not be tubed for several days; and it has been calculated that forty thousand barrels of oil were lost in the creek before it could be collected.

"The 'Noble' Well struck oil in April, 1863. Its daily yield was about fifteen hundred barrels, at which rate it flowed for six months.

"There must be lakes of petroleum to render such flows possible. Where are the bodies of fucoids or sea weeds from which this oil could flow? The sea weeds of the Silurian and Devonian times (in whose beds the greatest quantity of petroleum is found) were so loose in structure, and contained so little bituminous matter, that their impressions do not even darken the light colored shales in which they are found embedded. Had these plants been as oily as fish, their bodies would have left dark impressions on the shales, as the bodies of fish do; and if they were not as oily as fish, or as bituminous as land plants, by what possibility could they produce lakes of oil? If the plants had, indeed, been oily, no oil could have been collected from them, unless preserved from contact with the air and water. Each plant being separated from its companions, on being buried in mud, the oil, supposing any to exist, would have been absorbed by it, and thus lost.

"Has the oil been distilled from bituminous shales, as some suppose? I think not. It requires a strong heat to distil oil from shales; and generally, where petroleum is found in the greatest abundance, there is the least appearance of igneous action.

"How was it produced, then? It is a *coral* oil, and not a *coal* oil. I have in my possession numerous specimens of fossil coral, obtained from Devonian and Silurian rocks belonging to the family of *favosites*, or honeycomb stone, as the name means, the cells of which very much resemble those of the honeycomb; and, as the cells of the honeycomb are filled with honey, these cells are filled with oil. I have found oil in some specimens nearly as limpid as water; and, by heating the coral, oil runs out readily. I have seen these oil-bearing corals at Smokes Creek, where there are coral reefs full of it; in the Silurian limestones of Middle Tennessee; at Williamsville, near Buffalo; and in rocks near Penn Yan, in New York. In the State Collection of Fossils at Albany, and in the Montreal Geological Cabinet, there are numerous specimens. Professor Dana informs us, that it flows in drops from a fossil coral at Montmorenci, Can., and at Watertown, N. Y. It might be supposed that this oil filled the cavities of the corals, as it might any other cavity in the rocks; but I have found it repeatedly in these corals, and in no other part of the rock, invariably accompanying the corals, and never connected with any other fossil; these corals frequently in the center of solid limestone blocks. Reefs of such coral would furnish oil in quantities sufficient to account for the immense deposits that have been discovered. Preserved by them in compact bodies, the oil taking up at least half the space of the coral reef, we can readily suppose, that when the cells were crushed by the superincumbent weight of rock, or during upheavals and subsidences, cavities and crevices in the earth's interior would be filled by it.

"It is, then, an animal production, and not a vegetable one. It is a product of the ocean, and not of the land; being almost invariably associated with salt water from the bottoms of seas that then covered a large portion of Western New York, Pennsylvania, Virginia, Eastern Ohio, Kentucky, and Tennessee. It is not formed from the bodies of the coral polyps, as some have supposed,—for, when dry, they are a mere film, that could be blown away by a child's breath,—but secreted from the impure waters, principally, though not exclusively, of the Devonian times; the coral polyps performing the same office for the water that the carboniferous plants did for the air."

ELECTRICAL NOVELTIES.

Electricity is a wizard's power. With it and little mechanical skill a man may turn his house into a magician's castle. The late ingenious Mr. Appold—of centrifugal pump notoriety—indeed, did this without it; his room doors opened as you approached them, and shut behind you; his stable gates did the same; upon touching a spring, the window shutters closed, and the gas was turned on; his apartments maintained themselves at a uniform temperature, and at a proper hygrometric state, by regulating thermometric and atmospheric damping apparatus; in short, his house was full or surprising devices, created and worked out by his wonderful inventive and executive skill. Had he pressed the subtle fluid into his service, there is no saying into what a palace of enchantment his dwelling would have been transformed. But what he did not do has been done by the famous Robert Houdin, who has made electricity do the work of a retinue of servants and a watchman to boot, a full description of which will be found on page 178, Vol., XVIII Scientific American.

Such are a few of the domestic functions of the most ubiquitous slave that science has entrapped for man. Of its public services we need hardly speak; telegraphs have become too familiar to be longer regarded as curiosities, even those that send the message in fac simile of the hand in which it is written, or reproduce a drawing a hundred miles away. Electric lights, too, have ceased to be surprising, though they are far from having been used to their full powers. There have been difficulties in the way of getting a good and cheap source of electricity, which have barred the way to their extensive introduction: but some of these are removed and we may entertain better hopes for the future. One of the great doctrines, perhaps the greatest, of the present era of science, is that of the convertibility of forces one into another. Heat is turned into mechanical force, and mechanical force is turned into electricity, and *vice versa*; and heat and electricity are similarly interconverted. A celebrated London photographer has erected a magneto-electric machine for conducting some of his operations which require an intensely bright illumination, and has thus apparently become independent of the sun; in reality, he is using the solar rays which came to our planet thousands of years ago, for what is coal but "bottled sunshine?" A Birmingham electro-plating firm also set up a similar machine for depositing their precious metals, and a sugar refinery another for generating ozone to bleach sugar. But the principal use of such an apparatus is for lighthouse illumination. A French company bought the patent for France to this end, and the light was to be tried at Cape Grisnez. It was not only to illuminate the Channel "a giorno," but to shed a mild twilight over our own southern counties. We have not heard of the trial—perhaps it has yet to come off.

From lighthouses, the transition to buoys and beacons is easy. These an ingenious inventor has proposed to illuminate by electricity. Those who attend scientific lectures, or look into instrument-makers' shops, will have come to know something of coils called "induction coils," for producing in effect a very powerful current of electricity from a very weak one, and of certain glass tubes and globes for exhibiting the passage of the electric spark through a partial vacuum. Well, the inventor aforesaid proposes to place a battery and a coil in the hollow body of a buoy, and to lead the current to one or more of these vacuum tubes inclosed in a lantern on the top. A steady light, glimmering like a glow-worm on the sea, would thus be secured, and neither wind nor wave could readily extinguish it. Some one else invented a lamp for miners on the same principle: a knapsack was to hold the battery and coil, and wires were to lead to a lamp composed of a vacuum tube carried in the hand. There could be no doubt of the safety of this light—in this respect it would rival the immortal Davy's invention; but portability is a rather necessary feature in any tool a pitman has to use, and the knapsack and entangling wires might prove rather worse than an inconvenience to him, especially when, as happens occasionally, he has to pick and wriggle his way, worm fashion, through a one foot seam.

Perhaps, after all, the most curious application of the electric light was that attempted lately at one of the Paris theaters. The actors were decked with glittering crowns, and, to add to their brilliancy, they were so made that a chaplet of electric sparks encircled the wearer's head; the necessary current being supplied and led to the coronet from a concealed battery. But the "sensation," pleasing enough doubtless to spectators, painfully verified the truth of the Shakespearian maxim touching the uneasiness of the head that wears a crown, for one of the performers was grievously injured by the passage of the current through his or her head, instead of through the star-spangled ornament. Not quite so striking, but still curious, are the electrical jewels made by MM. Trouvé and Cadet-Picard. These consist chiefly of scarf pins and brooches, representing heads of men and animals, which roll their eyes and work their jaws. Some are in the shape of tiny soldiers which beat drums, rabbits that play on tambors, and birds that flap their wings and fan their tails. They are worked by tiny electro-magnets concealed within them, and connected by fine wires with little batteries carried in the pocket or elsewhere about the dress. Fashionable Paris was charmed with these trifles for a season; doubtless they are forgotten by this time. Electricity is an agent peculiarly suited to French ideas, and has been turned to more droll uses by that people than by all the rest of the nations of the world put together. When rifles were the talk of the governments of Europe a few months ago, the emperor was shown one to be fired by electricity; the stock of the gun enclosed a battery, from whence wires passed to the breech and into connection with a platinum wire passing through the cartridge. The pull of the trigger closed the electric circuit, and in an instant the platinum wire became red hot and ignited the powder. The cartridge carried no fulminate, so it was a very safe one. The emperor, it was said, greatly admired the gun; he preferred to adopt the Chassepot, however.

From killing to curing. While one man is using his ingenuity to throw bullets into his fellow man, another is devising schemes to take them out. Probing the body for these missiles is a tedious and painful operation, and its difficulty chiefly lies in discovering the bullet amongst the fragments of shattered bone by which it may be surrounded.

Electricity affords the means of doing this. The probe is made with two points, from each of which a wire passes; and in the circuit is placed a battery and a signal bell. So long as the two points are not metallically connected, no current passes and the bell is silent; but, when they are joined by any piece of metal, it rings. When, then, the surgeon thrusts the probe against bone or muscle, there is no effect, but when the points come against the metal bullet, the bell announces the fact; the forceps for extracting the lead behave in the same manner. That electricity exercises an exciting influence over sluggish nerves is a fact insisted upon by medical galvanists, but it likewise appears to possess a deadening power over such as are excited, for a dentist in Bordeaux has applied it to dull the pain of tooth extraction. Report has spoken well of the application, but details of the *modus operandi* are wanting. For this one painful operation, at all events, chloroform has possibly been superseded by electricity; but the latter has joined issue with the former in another way, for two French electricians have very recently announced, as the result of experiments tried upon animals, that a powerful shock or strong galvanic current will restore animation in cases of over-stupefaction by the sedative.

These actions are inscrutable enough, but some recently announced influences of the fluid upon vegetable organisms are more puzzling still. In the beginning of the century a learned Abbé wrote a treatise on the applicability of atmos-

pheric electricity to the curing of diseases in plants, and encouraging their development, and he described his means of drawing currents from the clouds and air and distributing them among his cabbages and lettuces. Very surprising effects were produced, but little notice seems to have been taken of them; probably, because there is a natural tendency to ignore phenomena of the rationale of which no clear ideas can be formed. But quite recently M. Blondeau brought before the French Academy of Sciences the results of some experiments quite as startling as those of the worthy Abbé. He says that the current ripens fruits; of this he has assured himself by electrifying some apples, pears, and peaches, all of which ripened under the influence of the fluid, whilst the other fruit on the same trees remained far from ripe. Then he electrified seeds and grains, by steeping them in water and submitting them to the action of a powerful current. Peas, beans, and wheat, were so treated and sown in good soil. By the side of them were sown similar seeds not electrified. The former sprouted sooner than the latter; the development of the young plants was more rapid, and the stems and leaves were more vigorous than those not subjected to electrical influence. But, most mysterious of all, some beans that had been electrified grew upside down, with the roots in the air and the cotyledons in the soil.

For the mechanical and engineering arts, electricity has done much already; but it promises to do more. We have had an electric loom to dispense with the complications of the Jacquard cards, and some of our great iron-clads have been furnished with electrical call-boys for enabling the captain on the bridge to communicate his orders to the engineer below, and to the steersman at the wheel. Now, the engineer has the prospect of relief from his bugbear—boiler incrustation. It is asserted that the placing of a bundle of metallic spikes in the path of the steam as it issues from a boiler, has the effect of generating a stream of electricity, and that if this be led to the metal of the boiler, it sets up an action at the surface which prevents the deposit of saline matter. The question is a disputed one at present.

The phenomenon is unexplained, and therefore, in some quarters, discredited; and as yet, sufficiently crucial tests have not been applied to settle it indisputably as a matter of fact. So we pass on to another, and perhaps better established, application of the twin elements, electricity and magnetism. We allude to their use in the manufacturing and testing of iron. This metal, in its crude state, is full of impurities, such as carbon, sulphur, phosphorus, and silicious bodies. These are electro-negative in relation to iron, which is electro-positive. When, then, a powerful current is directed through the fluid metal in the melting furnace, the foreign matters are expelled with some boiling and commotion, and a very pure metal is produced and drawn off to the casting molds. This method of purification has been tested at Sheffield with remarkable success, and it foreshadows improvements in the manufacture of iron second only to those that have followed from the revolution effected by Bessemer in the making of steel. The author of the process in its present form is Mr. Robinson, of London; but a somewhat similar plan was suggested and tried five-and-twenty years ago, to the proof of the adage that there is nothing new, "except," as cynics say, "that which has been forgotten and re-discovered." The testing of iron castings and forgings by magnetism is an ingenious idea, the credit of which belongs to Mr. Saxby, R. N., one of our dockyard naval instructors. When a bar of iron is placed at a certain inclination to the vertical, it becomes temporarily a magnet, and behaves as such to a compass needle brought into its vicinity. If the bar be perfectly sound, free from cracks or cavities, the compass needle, when passed around it, goes through methodical evolutions, always directing its north point to particular regions of the bar, and otherwise behaving in an orderly manner. But if the iron be cracked or flawed internally, there will be breaks in the continuity of its magnetism corresponding with the mechanical interruptions, and these the compass needle will point out by behaving vagariously when when it passes over them. This is the principle of Mr. Saxby's tests; he has tried them practically at the Chatham and Sheerness dockyards, and with a success that gives great hopes of removing one of the greatest difficulties engineers have to cope with.

We have known an instance in which a large and valuable forging, the paddle shaft of one of our great steamships, was discovered to be defective only when, after weeks of labor, a cutting tool revealed the hitherto invisible flaw. The loss involved amounted to several thousand pounds, of which a part at least, might have been spared had some effective means been known for testing the soundness of the mass of metal.

The latest novelty is an electric organ. One of the most important and valuable properties of the galvanic current is that of transmitting power without motion. If we want to ring a bell at a distance, we must move the whole length of an intervening wire, and this motion takes strength and time. Similarly, to open the valve of an organ pipe by touching a clavier requires the intervention of complicated rods and levers. Strength is necessary to press down the key to work these levers, and time to communicate the motion to the pipe's orifice. Electricity requires neither; it instantly transmits force enough to open the valves without demanding more than a gentle pressure upon the clavier. Another advantage is, that the keyboards may be at any distance from the organ pipes. We heard this application suggested long ago; the credit of working it out now belongs to an English organ builder residing in Paris, who has made several instruments on the plan. One has already been erected at the Crystal Palace. Blown by steam—played by electricity—what is the king of instruments coming to?—*English paper.*

THE INFLUENCE OF SCIENTIFIC CONVENTIONS.

Prof. S. D. Tillman, in his address at the Autumnal Opening of the Polytechnic, on Thursday, the 10th inst., after alluding to the success of the late Scientific Congress at Chicago, said: "Nothing more was needed to confirm the general opinion as to the benefits arising from these annual gatherings. They accomplish for science what conventions do for religious, political, and commercial objects, by securing unity of purpose, concentrated effort, and expeditious action. Indeed, they do much more in dispelling illusions, which are often palmed off as truth among those who are only captivated by novelty. While discovery is constantly extending her domain, opening new paths of progress, and erecting new beacons, to direct those who are to follow, it is the special duty of advanced men to see that no false lights are shown which would lead to the propagation of unsound doctrine. Every new hypothesis or induction should be subjected to the keenest scrutiny of those who are competent to pass upon its merits. A scientist, who reads a paper before his peers, reaches at once the appreciative audience he most desires. If he describes new experiments, they, more than all others, are interested in the results; if he advances new views, they are ever ready to question the correctness of his conclusions. Thus, it frequently happens, that the discussion immediately following the reading of a paper, will dispose of objections, and establish positions which could not be reached in a long time through the medium of printed dissertations. Moreover, the suggestions often thrown out during the free exchange of ideas in a verbal debate, are of great service in exciting that enthusiasm in the votary of science which prompts him to higher efforts in the pursuit of truth.

"The beneficial influence of these scientific associations is not so obvious here as in Europe, where they are older and more firmly established. Of late, the British Association for the Advancement of Science has accomplished much; yet it will be remembered that, even after its formation, Sir John F. W. Herschel, in a note appended to his able treatise 'On Sound,' in the *Encyclopædia Metropolitana*, acknowledged his indebtedness to foreign journals for a portion of the information he then presented, and expressed his regret that so little attention was paid in his own country to what was being done by scientific men abroad. 'Here,' said he, 'whole branches of continental discovery are unstudied, and indeed almost unknown, even by name. It is in vain to conceal the melancholy truth. We are fast dropping behind. In mathematics we have long since drawn the rein, and given over a hopeless race. In chemistry the case is not much better.' These, and other words of regret and reproof then written, doubtless hastened the great and favorable change which has since taken place in his country. Certain it is, that the formation of the British Association has led to the happiest results; for to-day it may boast of many distinguished names in almost every branch of science.

"If there is any hindrance at present to the progress of truth, both here and abroad, it arises chiefly from the spirit of exclusiveness sometimes evinced by those who have devoted their lives to the study of physical laws. This should not excite surprise, because the tendency of abstract science is essentially aristocratic. The man who knows, stands on a higher plane than the one who does not know. Hence, the position of the scientist is impregnable. He has riches and power, of which he cannot be robbed. Should he find his chief enjoyment, however, in the reputation he has acquired, he may well fear rivalry. On the other hand, if he pursued truth for the love of it, he will welcome all who labor in the same spirit, and extend to those below him a helping hand.

"The study of natural laws, in the abstract, undoubtedly affords pure enjoyment; yet this feeling is vastly intensified by witnessing their successful application for the accomplishment of new and important results in the useful arts. Such results are often brought about by the artisan who, although he may know but few of these laws, understands most thoroughly all the conditions peculiar to his art, under which they can be effectually applied. Our great inventors have not, generally, had the advantage of a liberal education By ingenuity alone they take the lead, and, of course, counteract to a certain extent the haughtiness sometimes engendered by learning.

"Scientific associations will be entirely successful when they fully recognize the fact that Science in these modern times has a double mission. From serene hights she beckons on the student who longs for clearer views of the divine plan of the universe; yet often she descends to the humblest abodes of men, and watches while Invention weaves some new device. Thus, we find her potent influence in those improvements which lessen manual labor, supply corporal wants, and add to the material resources of our race. We, of the Polytechnic, welcome her in both offices, as revealer of long hidden links in the endless chain of sequences, and as prompter to new combinations of some of those links by which the surplus powers of nature are successfully applied to ingenious mechanism, and by which even new forces are generated, and made obedient to the will of man."

An Alarm.

We have in our house a little invention which we have several times noticed in other dwellings, but having no direct interest in its operation we have not paid much attention to its working. It is a little thing, and stands upon a little shelf in our sleeping room; but in an emergency it is capable of making a good deal of noise, and imparting useful information. It is an electric alarm, with wires entirely concealed from the eye, and which run from it to the doors and windows and scuttle of the house; and should any of these be disturbed, the alarm is at once sounded. By means of a "telltale" it can be ascertained at once in what part of the house to look for the disturbance.

The other night, before retiring to bed, we had the assurance of the servant that everything was close and secure. We set the alarm, but instantly it set to ringing, and we knew that something was wrong, and upon examining the "telltale, we found out where to look for the cause. The laundry window was dropped about an inch, and the little machine would not keep still until the matter was made right.

By the use of this little apparatus, thousands of dollars worth of property have been saved from burglars.

The Geysers of California.

A correspondent of the New York *Journal of Commerce*, writing from Sonora county, California, thus describes the Geysers of that state: After ranging through a considerable part of the State of California, seeing that which is most grand and beautiful, I am constrained to tarry here and in common with travelers who have peeked into the crater of Vesuvius and witnessed other strange spectacles in the Old World, to declare that the most strange and wonderful of all has been reserved for the last, when we gaze upon the extraordinary phenomena known as "The Geysers." Few objects in nature are more deserving of attention from those who delight in scientific investigation or desire to merely to gratify a love for the marvelous.

A deep serpentine canon or ravine about a quarter of a mile in length is flanked by walls of denuded rock, precipitous and rugged, full one hundred feet in hight, and through their entire extent strong jets of sulphurous vapor spring from every crevice, while along the base streams of water hot, hissing, gurgling, contribute to swell the volume of the torrent that sweeps down into the valley of the Russian river, its course marked by clouds of steam. The substances held in solution by these waters coat every boulder with mineral incrustations, and above the water line the disintegrating rocks bristle with crystalline sprays of sulphur, borax, alum, etc. Indeed that must be a desperate case which could not be cured by medicines found in that great laboratory; if no cure be effected, they would certainly do the other thing. Yellow, green, and gray colors predominate, with a large admixture of oxide of iron. The place where you thread is almost too hot for endurance. If you sit awhile to contemplate the extraordinary scene a sensation of discomfort suggests an immediate change of base. If a longer stay prove admissible, the probability is that clothing thus brought in contact with strong alkalies and acids would quickly be destroyed. This singular gorge is therefore not inappropriately named "Devil's Canon." In fact every object here is suggestive of something Satanic. The visitor is shown "The Witch's Cauldron," "The Devil's Smoke Pipe," "The Devil's Tea Kettle," etc. The roar of boiling water and the rush of steam commingle, rendering the human voice inaudible, except at short distances. The one is deep, profound, sepulchral, suggestive of spectral shapes, with horns and other diabolical appendages. The other is sprightly babbling, as if in mockery. A cane thrust into the yielding embankment is withdrawn, smeared through its entire length with a sticky pigment representing colors of every hue. Large masses are readily detached, rolling to the bottom, where they dissolve and float away. Seventeen varieties of mineral substances have been found here. In truth, if the contents of a huge drug store were multiplied one hundred times, then mixed promiscuously, and the whole villainous compound thrown into a chasm heated by subterranean fires the product might bear a faint comparison with the geysers of Sonora county. In one place a pool of water, black as Erebus, and about ten feet in diameter, is seen boiling furiously. To fall in would be instant death. Elsewhere the stream escapes from fissures in the rock with a power sufficient to hurl stones from the opening with great violence.

These phenomena have been variously explained, some ascribing their origin to a volcanic agency, as scoria and lava are found plentifully. Others suggest that the mixture of acids, and alkalies taking place causes a combustion, the effects of which are apparent. The last theory advanced receives support from the fact, that the geysers manifest much greater activity after a season of heavy rain; erudite professors must settle this question.

More Vandalism.

One of the peculiar faculties of the late Prof. Faraday consisted in his great mechanical ingenuity and constructiveness, as evidenced in the apparatus for conducting the original and elaborate experiments by which he arrived at such great results. Their main character was simplicity, which is indeed the perfection of ingenuity, and the distinguishing feature of the work of genius. As has lately been remarked by a good judge, "the practical powers were never perhaps more strikingly displayed by man than in the various contrivances he adopted while conducting his researches—some of them being almost equivalent in ingenuity to the compilation of a steam engine." We regret to have to record the fate of the greater portion of these contrivances. Shortly after Mr. Faraday's death they were given by his wife to the porter of the Royal Institution, who, we need not say, could scarcely appreciate them. He accordingly sold them piecemeal, and even parts of the same apparatus to different buyers, thus breaking up combinations that probably were understood by few except their gifted inventor. Thus it is probable that all this splendid collection is destined to be scattered and distributed among those to whom their only value will be as souvenirs of departed greatness.

A CURIOUS accident recently happened at Almond, Mich. The jack wheel of a threshing machine burst and killed Albert Tucker, who was in charge of the machine.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Adhesion, Cohesion, Gravitation.

MESSRS. EDITORS:—Natural philosophers make three divisions of the attraction of matter for matter, viz., adhesion, cohesion, and gravitation. If we seek for the basis of this classification, we find that it is merely the intensity of the attraction; that is, between adhesion, cohesion, and gravitation, there is only a difference in degree and not in kind. Ought we to admit that there are three "kinds" of attraction manifest in bulky matter, when we observe nothing more than the clinging of atoms together with unequal degrees of force? To do so is to violate that demand for simplicity everywhere made by science.

These different attractions depend on the proximity of the ultimate particles. Common facts prove this. Suspend two plates of glass near each other by long cords. They approach each other, illustrating gravitation. Bring their particles nearer together by pressing one upon the other and adhesion is manifest. How that a still closer approximation of atoms produces cohesion, may be thus shown. Break one of the plates in such a manner that cracks will radiate from a center, and spring apart the pieces of glass on each side of one of these cracks. The crack will be seen to advance a short space, but upon the pressure ceasing it will entirely disappear for the space it had advanced. No air or dust having entered, the particles were free to come very close together and thus to cohere. Where the glass was plainly broken for about an inch, it is now entire. This theory of the "kinds" of attraction depending on the distance between particles reduces all to one power or force, the peculiar energy of the atom, the basis of the correlation and conservation of force as taught by Faraday, Grove, and others, the energy more beautifully and definitely exhibited in the various forms of chemical attraction.

F. T. GLOVER.

Providence Conf. Seminary, R. I.

[Our correspondent is mistaken in his premises as well as his conclusions. The distinctions which exist between the different kinds of attraction are marked. The attraction of gravitation acts upon bodies or particles of matter, however far they may be separated. The attractions of cohesion and adhesion act only at insensible distances. That there is a difference in kind as well as degree will also be manifest, when the distinction between adhesion and cohesion (evidently not comprehended by our correspondent) is considered. Cohesion only exists between particles of the same kind, adhesion only between particles of different kinds of matter, and does not exist at all in many instances. Mercury and glass are two bodies which are attracted toward each other, when distant from each other, by the universal law of gravitation, when brought near to each other they will not adhere in the slightest degree. Gaseous bodies also obey the law of gravitation but they are destitute of cohesion. The distinctions made between the different kinds of attraction were probably not made so hastily as the opinions of our correspondent, and were probably based upon a more complete knowledge of physical phenomena than he has yet obtained.—EDS.

The Velocipede Mania—An Improvement Wanted.

MESSRS. EDITORS:—I would beg to call your attention to a large field for American inventors, and if your journal would give my ideas a notice it would probably render a service. All France is crazy on the subject of velocipedes, and clubs are forming in every town and city. Velocipede races are more of an every day occurrence than horse races, and the manufacturers cannot supply half the demand. Those sold here are of two descriptions. In the one, the person is seated in a kind of chair, and works two pedals by the feet, and a lever with the right hand. The other and favorite description consists of two wheels, coupled together by an iron brace which serves for a seat. The forward wheel has projections for the feet, and the motion is obtained by a rolling movement of the leg. These last are tiresome, require some practice to learn, and a very nice balance not to fall over.

What is wanted is a system more simple, which one can learn at the first lesson; less fatiguing, and an equilibrium which will permit the velocipede to stand alone. For a patent in France that would conserve these requirements, I would give $2,000 in gold. If you think it worth while to notice this in your paper you would oblige me.

C. R. G.

Paris, Aug. 31, 1868.

[The above comes from a responsible American gentleman, now carrying on an active business in Paris.—EDS.

Sun Power, Etc.

MESSRS. EDITORS:—In No. 11, current volume of the SCIENTIFIC AMERICAN, your correspondent "A" presents the idea of raising a vast weight up an incline (why not a perpendicular in level countries?) utilizing the expansion of metals by sun heat, and obtaining a small though irresistible motion of the mass on each successive day. Now I would suggest an endless chain with buckets of any required size to contain water (sand?); self-filling at the bottom, self-discharging at the top, thus "concentrating" the power in a reservoir for "transportation" through pipes to any point, for use, there to be transmitted to machinery through turbines. I suggest that the metal bars constitute the framework of the endless chain and supports, to have a mutual action and reaction upon each other, whereby the contractile as well as the expansive forces be utilized, and these forces, being equal, double the motion obtained. (Any good mechanic can supply details of construction). I suggest lenses, co-longitudinal with the bars to increase the heat if found expedient in practice. I suggest an automatic arrangement for multiplying the number of reciprocatory movements of the bars of force from one per day—as "A" has it—to any economical number desired, depending on the weather. This, by a self-acting shade to cut off the sun's rays when expansion maximates, and again expose to the sun when contraction maximates, thus obtaining as many motions per day as "A" would per season. By this plan there would be no trouble about gearing up or down to convert power into speed or lose it by friction of such gearing. I hope "A" can offer a better plan than the above, and if he does, then I also have one or two more left for his consideration.

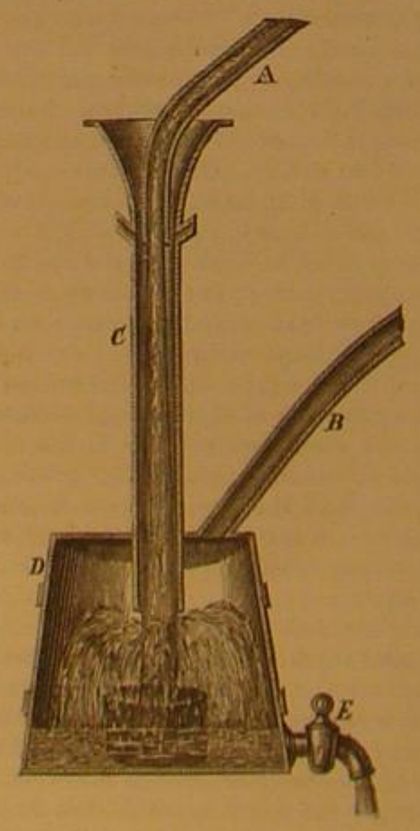
W. L. D.

Concentration, Transmission, and Transportation of Motive Power.

MESSRS. EDITORS:—In my former communication, published on page 163, current volume of the SCIENTIFIC AMERICAN, I remarked in substance, that it seemed strange that such an obvious source of power as solar heat should not have been heretofore made directly applicable to mechanical work. In your issue of 16th September, you publish a very interesting letter from the pen of C. H. Delamater, giving a statement of the progress which has been made by Capt. Ericsson, in his experiments with solar heat as a motor. Your correspondent states that I am mistaken in supposing due attention has not been paid to this subject. While I might call attention to the fact that very many periodicals devoted to mechanical engineering, as well as the transactions of learned societies, of which I have for years been a constant reader, contain, if anything at all, the most meager and general allusions to the direct mechanical application of this great source of power, it seems to me that the very fact that in this mechanical age no successful application of it has yet been made (if we except Capt. Ericsson's invention), is a sufficient evidence that due attention has not been paid to such an obvious and infinite power as solar heat.

I am delighted to hear of the success realized by Capt. Ericsson. While I was aware that some discussion in regard to this subject had lately taken place in France, as well as in other parts of Europe, I had not learned the progress that celebrated engineer had made until it was first published in this country, through the communication of Mr. Delamater to your valuable journal. I am glad that my letter called out that interesting correspondence although it has in a measure forestalled what I intended to have suggested in this letter. I have no claims to make as to originality in what I shall say, or what I have said about solar heat. Further on I shall suggest what I think is a new application of a very old device, yet I am not sure that even that has not been thought of. I wish it distinctly understood that I have no ambition to gratify in these letters, they being written in the desire to call the attention of other and abler engineers than myself, to the supply of what seems to me to be imperatively demanded at this time in order to meet coming exigencies.

In my former letter I called attention to the fact that the distribution of power highly concentrated was the chief difficulty in making a direct application of solar heat to moving machinery. At the risk of being suspected of borrowing an



idea from Mr. Delamater's letter, I will state that it was my intention to have suggested in my present letter the concentration of the solar heat itself, but he has spared me the necessity of saying much upon that point. The correctness of my own views is sustained by his account of the views and success of one of the greatest engineers of the age. I will therefore pass on to the discussion of the transmission and transportation of motive power. Both the transmission and transportation of motive power have, to a limited extent, been generally practiced for many years. The steam engine is an example of the former, the motive power being transmitted through pipes from the boiler to the cylinder, while the common soda water fountain is an example of the transportation of power, i. e., compressed gas. More extended applications of the method have been attempted, the objects being the propulsion of horse cars, etc.; but the results of all such attempts have, I think, convinced most engineers that anything like a general application of it to the driving of machinery is utterly out of the question. Not so with regard to transmission; and here I again find myself somewhat forestalled by your article, published on page 196, entitled "Transmission of Hydraulic Power, etc.," containing the suggestions of M. Leloup. I am confident that no engineer will read that article without being convinced that there is enough promise in this subject to repay investigation and experiment, although he may possibly object in some particulars, to the details of the apparatus proposed to effect the desired object. I am confident that no such complicated arrangement as that of M. Leloup would be necessary in most cases, and often a water wheel might even be dispensed with. On page 477 of "Ewbank's Hydraulics," is a description of an ancient machine called the *trombe*, or water bellows. I give herewith a drawing of one of these machines. The pipe, A, discharges water from the reservoir into the trumpet-shaped mouth of the vertical pipe, C. The end of the pipe, A, terminates in the pipe, C, at the bottom of the trumpet-shaped mouth. Opposite the lower end of A, are made a number of openings in the pipe, C, having short inclined tubes projecting from them, two of which are shown in the drawing. The lower end of C, enters the close vessel, D, and discharges its contents on a stone placed directly under it. As the water from A passes down into C, it draws air along with it through the top of the funnel, and also through the holes in the upper part of C. As the liquid dashes against the stone, the air separates and rises to the top of the vessel, whence it is forced under pressure through B, while the water accumulated at the bottom is drawn off by the regulating cock, E. This instrument, even in the rude form here presented, is capable of performing a good deal of work, and I feel sure that it can be improved so as to vastly increase its efficiency. A series of trombes might be made to supply compressed air from the falls of Niagara, through a system of pipes, at less cost than the gas works of that city, which would supply motive power for all its engines, elevators in warehouses, printing presses, etc. The cities of Troy and Albany might be supplied during a great portion of the year from Cohoes Falls. In many places it might be necessary to adopt some device like that suggested by M. Leloup, but where the trombe can be applied, it is doubtless the very simplest of all devices for obtaining a supply of compressed air.

With all the engineering and inventive talent possessed by the United States, I believe the honor of making initiatory experiments in this field should not be left to other lands, and and whether or not the suggestions I have made shall prove to be of any direct value, if they awaken thought upon this important subject among your mechanical readers they will not be altogether worthless.

A.

Index Plates for Gear Cutting.

MESSRS. EDITORS:—We have noticed the communications of your correspondent E. H. H. respecting index plates for gear-cutting machines, and herewith give the numbers for two sizes which we have been in the habit of using, thinking it would interest some of your readers. In a plate 24 inches in diameter we drill the following circles:

126	158	188	220
128	160	190	222
130	162	192	224
132	164	194	226
134	166	196	228
136	168	198	230
138	170	200	232
140	172	202	234
142	174	204	236
144	176	206	238
146	178	208	240
148	180	210	242
150	182	212	244
152	184	214	246
154	186	216	248
156		218	250

Number of circles, 63; number of holes, 11,844. Will divide all numbers to 125, and all even numbers to 250, or 187 different numbers. Diameter of inside circle, 7 inches. Distance from center to center of holes in inside circle, 0.175 inch; do. in outside circle, ·301 inch; do. between circles, ·135 inch.

The 28-inch plate has the following circles:

152	182	212	242	272
154	184	214	244	274
156	186	216	246	276
158	188	218	248	278
160	190	220	250	280
162	192	222	252	282
164	194	224	254	284
166	196	226	256	286
168	198	228	258	288
170	200	230	260	290
172	202	232	262	292
174	204	234	264	294
176	206	236	266	296
178	208	238	268	298
180	210	240	270	300

Number of circles, 75; number of holes, 16,950. Will divide all numbers to 150, and all even numbers to 300, or 224 different numbers. Diameter of inside circle, 7 76 inches. Distance from center of holes in inside circle, ·160 inch; outside circle, ·293 inch; between circles, ·135 inch.

BROWN & SHARPE MANUFACTURING COMPANY.

Providence, R. I.

Poison of the Locust.

MESSRS. EDITORS:—An article in the SCIENTIFIC AMERICAN of Aug. 26, copied from the *Medical and Surgical Reporter* in relation to the poison of the locust, calls to my mind some observations made during their visit to this section in June last.

The locust said to be poisonous is not the insect resembling the grasshopper, but the red-eyed cicada, popularly known as the "Seventeen Years' Locust," and is different from that other member of the cicada family frequently called locust, but which are common among us every year.

The eggs of the red-eyed cicada are injurious to vegetation, and trees are frequently seen with their tops dead from the eggs deposited by locusts in the bark of the upper tender branches. The sting, so called, is the incision made by the ovipositor of the insect, in which incision, generally in the bark of trees, the eggs are deposited.

It was only in the latter part of the locust season that per

sons were stung by them, and I think it may be accounted for as follows: Those insects which had not deposited until late in the season were, perhaps, delayed after their time was fully come, and, in obedience to Nature's law, were driven suddenly to relieve themselves, and hence their tenacity in maintaining themselves upon the human flesh until their object was accomplished. This theory is supported by the facts that the eggs are so injurious to vegetation when deposited in the bark of trees, and that it was during only the latter part of the season, when they were depositing their eggs, that instances were known of persons having been stung or poisoned. In several instances which came to my knowledge, the locust resisted attempts to brush or throw it off until the deposit had been effected. The treatment in the case of a child stung, was bathing in salt water to reduce the inflammation, which extended rapidly, and further, to remove the cause of the inflammation, viz., the eggs deposited in the wound.

C. A. LEWIS.

Washington, D. C.

Submarine Engineering.

Among the many interesting things which the visitor to the rapidly-progressing railroad bridge will see, is the improved process by which men can work under water by a method which has taken the place of the former diving bell. So far as anything like a diving bell is concerned the operator carries it upon his head. The need for such labor is to level the rip rap rock which fills the spaces between the piles, and around them, just above the bottom of the river, to make a perfect sub-structure for the piers after the piles have been sawed off one or two feet above the bottom.

The contract for this work was taken by Mr. Perry, who has in his service for the under-water work, Mr. Quinn and Mr. King. We were at the place of one of the piers yesterday, and waited a few minutes to see Mr. Quinn come up after a four hours' submersion and hard work at the bottom of the river. On the edge of the flatboat stood Mr. King with a rope in one hand and an India rubber tube in the other, both extended out into the water and let out or drawn in to correspond with the motions of the man below, or to yield to, or counteract the strong current of the river, as rapid near the bottom as it was eighteen feet above at the surface. The rope was to communicate understood signals—the tube to convey a proper and uniform supply of air to the sub-aqueous man. Down stream large bubbles of air were almost constantly rising to the surface, air which Mr. Quinn no longer had any use for, or a surplus applied by a very ingeniously constructed air-pump by which three pistons were so adjusted upon a crooked revolving shaft that one of them was constantly and quickly forcing nearly a gallon of air within the sub-marine armor in which the operator was dressed.

A signal was given to ask if all was "right." Responsive twitches of the rope meant "all right." Soon after the signal was given for "dinner time." Then slowly crawled Mr. Quinn to a ladder suspended from the boat to the bottom of the river. The bubbles are seen further up stream—the rope and tube are gradually pulled in—the top of the ladder trembles and he is coming up slowly with his armor-dress of more than a hundred pounds heavier than the weight of his body. Out of the turbid water emerges a frightful head with a great square eye as large as a hand, in front, and a similar one on either side, but without hair, or mouth, or eyes, or any resemblance to the "human face divine." Human hands are seen on the ladder—an unwieldy outline of a human body is seen beneath the great head, nearly two feet in diameter. His assistants thumb a few screws and take on the copper helmet, revealing the good-looking English face of Mr. Quinn. Relieved of sixty pounds weight on his breast and back, and shoes with leaden soles of thirty pounds each, which, being removed, his canvass-rubber clothing is removed, and there he sits, or stands, a proper sized man in dry, ordinary clothing, only his naked hands having been wet.

So strong is the current of the river these sub-water men can scarcely stand against the force of the current, though borne down by armor and weights to the amount of 275 pounds. This weight is partly requisite on account of the amount of air inclosed, for breathing purposes, within the encasing armor. Except a slightly painful sensation from the pressure of condensed atmosphere in the ears, on the first practice of under-water work, they say that no other inconvenience arises from a temporary residence in Neptune's dominions, or, as we live on fresh water shore, we should say the realms of the Nymphs, Naids, or Potamids.

The sub-river men occasionally place a hand upon a fish, which naturally leaves that neighborhood, instanter, but whither he goes the diver cannot tell, for in the dark water of this river, at that depth, he cannot even distinguish the rope or the white air-tube more than six inches from his face, All this work of leveling and adjusting square rods of loose rock must be done by the sense of feeling, battling with the current upon his hands and knees.

Such are among the wonderful matters of science and skill going on within a mile or two of our city, and yet not one in a hundred knows the tenth part of the interesting things connected with the work of the great railroad bridge which is soon to span the river, and be as great a benefit to Dubuque as it is an honor to those who projected and to those who are building it.—*Dubuque Times.*

Brick Making by Machinery—The Gard Machine.

It is pleasant to say a good word for a really good thing, and such, we are convinced, is the brick machine invented by E. R. Gard, of Chicago, Ill., descriptions of which may be found on page 238, Vol. XIV., and page 132, Vol. XVI., SCIENTIFIC AMERICAN. These descriptions, however, of a machine not then perfected, do not convey a proper idea of the machine we saw in operation a few days ago, which turned out seventy perfect bricks per minute from raw clay, bricks so perfect that they could be "hacked" nine high from the machine without crumbling, defacement, or the necessity of previous drying. Fully equal to hand made, in other respects, these bricks present an edge face as smooth as that of the famous Philadelphia bricks, while their side faces are excellently well adapted to holding and retaining the mortar. The machine uses the clay just from the bank, nothing ever being required to be added but water, and that rarely, and turns out the perfected bricks at a rate only limited by the capacity of the workmen to remove them.

The confidence of the inventor in the superiority of his machine is evinced by his challenge to the owners of all other machines in the country, of a competitive trial on the fairest terms, the proceeds of the trial to be given to charitable objects. A full size working machine may be seen in operation in the rear of 59 Ann street, New York, from 9 A.M. to 3 P.M., and we suggest to our builders and others a visit. For descriptive pamphlet address E. R. Gard, New York City.

BARR'S IMPROVEMENT IN CENTRIFUGAL MACHINES.

The Weston Centrifugal Machine, becoming quite commonly known—over one hundred being now in use in sugar refineries—is a great improvement on the common machine by being self-balancing, a result obtained by suspending the rotating cylinder, allowing it to gyrate in accordance with the varying distribution of the load, thus greatly reducing the power necessary to drive the machine. This gyration is sometimes excessive and the object of the improvement illustrated in the engravings is to prevent this excess of movement without interfering with the productive results of the machine.

Fig. 1

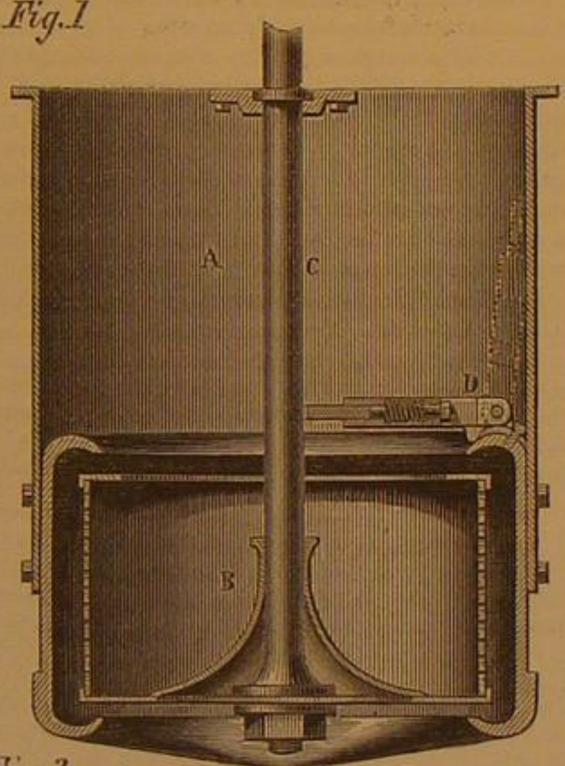


Fig. 3

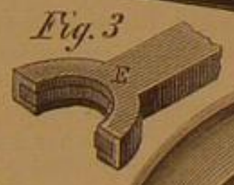


Fig. 2

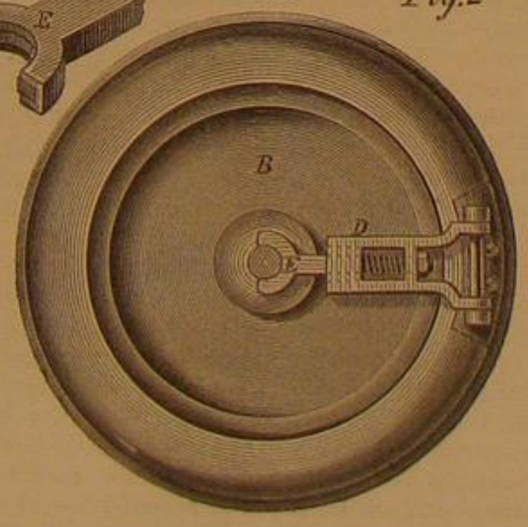


Fig. 1 is a vertical section showing the improvement; Fig. 2 is a plan or top view; and Fig. 3, a perspective view of the device itself, the clutch.

A is a stationary cylindrical case, suspended from timber or the ceiling of the room, and B is the revolving cylindrical vessel for receiving the sugar or other material to be operated upon, and having perforated sides. C is a vertical shaft by which this vessel is suspended. The improvement consists in a hinged frame, D, for guiding the shaft, and a clutch, E, working in the frame.

The frame, D, is hinged to the outer case, A, so that it and the clutch may be raised. When the clutch is in contact with the shaft, C, the frame and clutch are prevented from passing below a level by lugs on the side of the case near the pivot by which the frame and clutch are supported. The shank of the clutch is encircled by a spiral spring intended to yield sufficiently to the swing of the rotating cylinder, but also to check it to prevent it from gyrating beyond a certain limit. The tension of this spring and its consequent bearing against the shaft, C, is regulated by a nut on the end of the clutch shank.

The inventor of this improvement claims that by its use the expense of an attendant is avoided; the forked bar or clutch preventing the violent shocks and vibrations, which occur when the cylinder is unevenly loaded, and an unyielding bearing is employed. During the time of charging the machine the shaft is most liable to gyrate, and the forked rod is most needed, and the latter being of inconsiderable width and occupying but a small proportional space, does not interfere with the operation of charging.

Patented by Robert J. Barr, August 4, 1868. Letters may be addressed to him at 618 S. Delaware Ave., Philadelphia, Pa.

Inproved Method of Preserving Wood.

Patented April 14, 1868, by Theodore William Heinemann, New York city.

I first boil the wood in a weak solution of carbonate of soda or any other alkali, or muriatic acid (pure, crude, or waste materials will answer equally well, but of the pure, one part in fifty to two hundred of water is strong enough), until the liquor ceases to abstract color from the wood, which then is free of nitrogenous matter, and consequently no longer subject to spontaneous decay, and after drying in the usual way, if intended for use where it will not be exposed to the inroads of water, insects, etc., needs no other treatment. But if it be intended for railway sleepers, or purposes where it may be much exposed, or come in contact with nitrogenous or fermenting substances, I subject it to a second treatment in a close boiler, of suitable size and shape, strong enough to bear a very high pressure, conveniently fitted with an air-tight door, also with horizontal cross bars, which serve as braces to strengthen the boiler, and at the same time keep the wood from floating, with a safety valve, discharge cock, pressure-gage, and thermometer.

Into this boiler I put the wood, and with it enough rosin, when liquefied, to cover it, and sufficient water to fill, when converted into steam, the whole of the remaining space in the boiler. I then close the door tightly, and heat the boiler gradually until the thermometer shows the contents to be at about 306° Fah., when the rosin is as liquid and penetrating as boiling water, and the steam, being of a very high pressure, forces the rosin through all the pores of the wood. I keep the same temperature up just long enough to have the wood evenly heated all the way through, the time varying according to the thickness of the pieces treated. After that I lessen the heat gradually, until the thermometer shows the mass inside the boiler to have cooled down to about 200° Fah., when I suddenly raise the temperature again, and as soon as the rosin has become sufficiently liquid, I open the discharge-cock and allow it to drain off. The wood may then be taken out, and on cooling will be found very compact, hard, elastic, impervious to water, even if left in it for a long time, not subject to shrinking, warping, or the attacks of insects, and indestructible except by fire.

If it be desirable, however, to make the wood effectually resist even the power of the last-mentioned agent of destruction, I substitute soda or potash water-glass instead of the rosin, in the process last described, and after thoroughly impregnating it, dry it and allow it to lie for some time in muriatic acid or some concentrated solution of a metallic salt, which will make an insoluble silicate.

New Bridge at Niagara Falls.

They are building a new suspension bridge at Niagara close to the Falls, for carriages and foot passengers. On the American side the towers are within a few hundred feet of Falls, and the cables are already swung across to corresponding towers close to the Clifton House. In some respects this bridge is more remarkable than the other. In length it exceeds it 450 feet, being 1,250 feet in the span. The towers are 105 feet high, and are built 13½ feet apart. Unlike the heavy stone columns of the lower bridge, they are light wooded trestles, twenty-eight feet square at the base and tapering to the top. When finished they will be roofed and weatherboarded.

The bridge will be sustained by two cables, which were swung last winter when the ice filled the river below the Falls. The lower bridge is sustained by four cables. Those of the new bridge are composed of seven strands of twisted steel wire, each mustering two and three-eighths inches in diameter, which form a cable about nine inches thick. The ends are fastened by the new shackles invented by Mr. Hewlett, of Niagara, in a manner very different from that formerly adopted. The strands of the cable are untwisted at the ends, and hang separately from the tops of the towers. Each is secured to a separate shackle, which looks something like a pulley with a fixed wheel. These are grooved so as to hold the cable by means of friction, independent of the fastening at the ends, if necessary. The shackles are of various lengths, so as to divide the strain as much as possible, and are secured to a base firmly planted in beds of masonry eighteen feet square. This will probably hold the weight of the bridge against any ordinary pressure; and unless the slight towers are racked and weakened by the lateral motion caused by the high winds of the winter season, it will probably last as long as the other. The inside measurement of the bridge will be ten feet in the clear. As this will barely enable carriages to pass each other, it is a wonder that an additional two feet were not added when the cables were swung.

Novel Application of Asphalte.

The repellent property of asphalte bitumen with regard to water, which is so characteristic that samples of natural asphalte, though they contain much mineral matter, scarcely ever yield any moisture to analysis, has already led to its use for lining water tanks and cisterns which are not required to hold boiling water. Now, however, it is proposed to use it for canals as an economical and very desirable substitute for the ordinary puddling. But we need scarcely observe, it is only the best description of Seyssel asphalte that would answer the purpose in a satisfactory manner, and remain water

tight for any length of time Instead of a great thickness of argilaceous material, called puddle, which is not always at hand, and only applied with great labor and expense, the bed of the canal would have to be lined with Seyssel asphalte to the thickness of about one inch and a quarter.

The application of asphalte to canals would doubtless help to keep the water they contain in a pure state, and do away with that stagnant mud in which water weeds of the coarsest description flourish and impede the progress of the barges, while it in hot weather gives rise to fœtid emanations as soon as the water sinks a little below its highest level.

For this purpose the artificial asphalte, which is nothing more than gas tar mixed up with calcareous grit and sand, would not be found adequate, as it cannot be expected to afford a durable or an even surface. The necessity of employing natural asphalte for this and other purposes, instead of various artificial mixtures intended to imitate it, has been recently insisted on by an eminent engineer, who states that economy and durability are "only assured when the asphalte has a natural source like that shipped to London in large quantities from the mines of Pyriment Seyssel, in the Jura mountains." These mines have been worked by the Seyssel Asphalte Company since the year 1838, the period at which the late Captain Claridge introduced their product to England, and are still, we understand, far from being exhausted. —*Scientific Review.*

Electric Clock in London.

A remarkable clock has been erected for public use at the top of the offices of the Liverpool and London and Globe Insurance Companies, at the junction of Cornhill and Lombard streets, where it forms one of the most conspicuous objects to be seen in the city. The *Mechanic's Magazine* contains the following description of it: "The object of the Electric Clock Company, by whom it was erected, was to make the 'globe' do duty as a clock face; some of its convexity has, therefore, been sacrificed, but the result is a novel and beautiful object, the interest of which is only exceeded by its utility. The globe is surrounded by gilt stars which indicate the hours, and by the shape of the dial so much light is thrown upon them that they are visible by night and by day, while the pointers contribute greatly to the general effect of the design. The clock requires no winding up. The dial is illuminated by Schaeffer's patent double burners; and by an ingenious apparatus the gas is turned off every morning and evening two minutes earlier and two minutes later every day as the days are lengthening or shortening, and it is adjustable as well for the foggy days of November as for the light nights of summer."

The Chinese Woman's Telegraph.

During the recent visit here of the Chinese Ambassadors, one of them stated in reply to the inquiries of a physician, that it was not customary in China, except among the lower classes of the people, for the doctor to see or touch female patients. In order to ascertain the pulse of the sick woman, a string is tied around her wrist and extended outside the window to the doctor, who holds the string between thumb and finger, and by this sort of telegraph is enabled to count the pulsations. This seems a ludicrous plan; but it is far less mischievous than our custom of admitting men doctors to the private apartments of females. The opportunities for the medical education of women in this country are yearly increasing; and we hope the day is not far distant when the ladies will be able to rout the men from the sick room, and compel them to stand out in the cold, under the window sill. In China only women nurses attend during child-birth.

Charcoal Crucibles.

Mr. Gore communicates to the *Philosophical Magazine* an excellent way of making charcoal crucibles, etc. He first shapes the articles out of wood, and he finds that lignum vitæ, kingwood, ebony, and beech answer best. After the vessel has been formed, the wood is carefully dried in a warm place. The articles are then enclosed in a copper tube retort having two exit tubes for the escape of gas. This retort is heated slowly at first, and finally for some time to bright redness, to completely carbonize the wooden vessel. It is necessary, Mr. Gore says, to turn the retort continually, and so distribute the heat, that none of the tarry matter evolved may condense upon the articles; otherwise, he tells us, their shape and dimensions may be curiously altered. The heating is to be continued until no more gas is evolved, and care must be taken not to heat too rapidly, or the article will fall to pieces. Charcoal made in this way from lignum vitæ is remarkably hard, and the texture is so close as to make it apparently quite impervious to liquids; even after immersion in the strongest hydrofluoric acid the surface and no acid taste. Rods made of this lignum vitæ charcoal, conduct electricity admirably, and would probably, Mr. Gore says, answer well for pencils for the electric arc.

FORTY MILES OF SNOW SHEDS.—The Pacific Railroad Company are now engaged in erecting sheds over the cuttings and other exposed points. They are of heavy timber framework, with pointed gable roofs, and look as if they could withstand almost any pressure of snow. Nearly forty miles of the track will have to be thus covered, and the quantity of timber required will be enormous. Not less than twenty-two saw-mills, most of them worked by steam, are run night and day, employing nearly two thousand men; and yet they do not work up to the needs of the Company. It is estimated that it will require no less than eight hundred thousand feet of lumber to construct a mile of sheds. So great is the demand that the country on both sides of the track is being rapidly denuded of its forests.

Editorial Summary.

WHITE GUNPOWDER.—A correspondent writes us upon the subject of white gunpowder. The drift of his communication seems to be that it is not suitable for blasting. We agree with him that it is too costly, and makes too much smoke, which is annoying to miners; but we can scarcely see how our article, which was intended to be a general review of the subject, as discussed in scientific journals of this and other counties, could justify the opinion that we supposed it adapted to mining or quarrying. We even took ground against its use for heavy artillery, and only admitted the possibility of its adaption to small arms. The fact that it is apt to explode, during the operation of tamping, is to be inferred from the directions we gave for its use, and its cost should be compared only with that of fine gunpowder, and not with coarse and cheap blasting powder with which we had no intention of comparing it.

RECIPE FOR TOMATO KETCHUP.—Remove the skins by pouring scalding water over the tomatoes in a pan. Simmer the fruit at least one hour (a longer time will not injure); using sufficient water to keep from scorching. When cool wring the mass through a piece of coarse cotton or linen cloth wet in cold water. To each gallon of liquor add 2 tablespoonsful whole black pepper, one-third teaspoonful of pure cayenne pepper (ground), and 1 tablespoonful of cloves. Boil the whole until reduced one-third. Add 2 tablespoonfuls fine salt to every gallon while hot, and when cold strain out the spice and bottle. No vinegar is used. Will keep for years; but if scum rises at any time re-boil and add a little more seasoning.

THE BRITISH PATENT OFFICE.—In 1867, 2,284 patents were passed, and 2 253 specifications were filed. 2,528 applications for Letters Patent lapsed or were forfeited by neglect to proceed for patents within the six months of protection. The fees received in the year 1867 (by stamps) amounted to £112,843. The fees paid to the Attorney-General and Solicitor-General, and their clerks, amounted to £11,115; and the salaries and expenses of the office, compensation annuities, printing, and other expenditure, with the payment of the revenue stamp duty of £20,820, left a surplus income for the year of £42,840. The Commissioners—the Lord Chancellor, Master of the Rolls, Attorney-General, and Solicitor-General—renew their representation of the need of a suitable building for the Patent Office.

LIFE IN THE SEA.—Two well known naturalists, Dr. Carpenter and Professor Thomson, of Belfast, are engaged in a dredging expedition, to the westward of the Faroe Islands. This will decide the question whether there are living creatures in the deepest parts of the sea. Eminent authorities (the late Professor Edward Forbes among others, according to *Chambers's Journal*) have maintained that the pressure at the lower depths was too great to allow of existence being carried on—that there was not sufficient light—and that the water contained too little air.

THE velocipede is suggested as a substitute for the horse for the rapid transportation of infantry. Celerity of movement is the desideratum; for it is a maxim that the strength of an army, like the power in mechanics, is estimated by multiplying the mass by the rapidity. Now, as to comparative speed. Recently, in France, there was a race between a velocipedist and a horseman for a distance of forty-five miles, when the latter won by only twenty-five minutes, after a run of six hours. It is stated that but for a head wind that blew all the time the machine would have won. Imagine a body of troops moving on the enemy mounted on the velocipede. It would be a great sight.

THE proposition has been made to make a canal across Southern Michigan to connect Lakes Michigan and Erie, and thus save the grain laden vessels eastward bound a voyage of about 400 miles which they are now obliged to make around the southern peninsula of the Wolverine State. Another proposition of a similar nature is a canal through Canada connecting Lakes Huron and Ontario. Both are said to be feasible, and the latter can be accomplished, the engineers think, for $40,000,000. This, however, is not so important as the route from Lake Michigan to Lake Erie, as but a small proportion of the commerce of the lakes extends to Lake Ontario.

It has long been contended that steel boilers never could be used, not being sufficiently tenacious. But this theory has been badly damaged by some recent experiments at Pittsburg when a steel boiler has withstood the most pressure that could be brought to bear upon it. The boiler is made of two plates of No 3 steel, ¼ inch thick, 6 feet long, and 38 inches in diameter. It has been subjected to several tests, the 10th trial giving it a pressure of 725 pounds to the square inch. Experiments on it continue, but up to this writing no pressure has been able to burst the boiler. It has stretched three inches since the tests commenced.

WOUNDS BY THE CHASSEPOT RIFLE.—Experiments have recently been made at the camp of Lyons on the bodies of dead horses, with the view of ascertaining the precise character of the wounds produced by conical bullets discharged from the Chassepot muskets. It is said that the aperture made by the projectile at the moment it penetrates the flesh is commonly no larger than ordinary pea, but that the rotary movement of the ball revolving on its axis gradually enlarges its circles until it makes a hole into which a person could thrust both fists.

THE foreign exports of petroleum, from the United States, from January 1 to September 12, have been as follows, for the years indicated: 1868 67,921,290 gallons; 1867, 41,949,820 gallons; 1866, 39,792,292 gallons; 1865, 12,680,524 gallons. Received at New York, from January 1 to September 12; 1868, 692,029 barrels; 1867, 792,507 barrels.

A NEW Russian invention is a letter-box, so contrived that when a letter is deposited, it gives the depositor a ticket in exchange, showing the date when the letter was put in the box. We are not informed whether the Government is expected to assume any responsibility not already assumed in regard to the safe delivery of letters. If not, what is the invention worth?

CATTLE PLAGUE IN RUSSIA.—The cattle plague is making great ravages in the governments of Pskof and Novgorod. The disease has also made its appearance in the environs of St. Petersburg and Moscow. One of the Russian papers remarks that the cattle plague will do more mischief in the empire than a thousand Polish insurrections.

UNDER the Ming dynasty, in China, paper money issued by the government is inscribed with the hint that it must be received as coin, and that whoever refuses to so receive it shall have his head cut off. There is no premium on gold or discussion as to how the currency shall be redeemed, in China.

AN Albany mechanic has invented a process of manufacturing paper boxes by pressing the pulp in molds. They come out fit for immediate use, and can be made quicker and cheaper than from the board.

EARTHQUAKE AT GIBRALTAR.—There has lately been an earthquake at Gibraltar, the first which occurred for many years. Two distinct shocks were felt, but it does not appear that any serious damage resulted.

A MAN in Lynn, Mass., a few days ago made fifteen pairs of ladies' gaiters in less than ten hours, making seven dollars and fifty cents. This is the greatest feat known to be accomplished by any shoemaker.

PROF. WHITTLESEY has discovered evidences of the residence of man at the High Rock Spring, Saratoga, just 4,840 years ago, or about six centuries before the deluge.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

From January 1st to September 1st, this year, the receipts of lumber at Chicago were 659,317,000 feet, and 157,117,000 shingles.

The Detroit Car Company have a contract for 200 platform cars for the Union Pacific Railroad.

The Society of Arts, London, has offered prizes for the best improved models of railway meat-vans, milk-vans, and milk-cans.

The earnings of western railroads, as shown in the official reports, indicate a large increase in their business.

The cost of the iron bridge to be erected by the Union Pacific Railroad Company over the Missouri river will probably not fall below two millions of dollars.

The first woolen mill built in Minneapolis, Minnesota, was the North Star Woolen Mill erected in 1864. It is of stone, seventy by fifty feet, and four stories high.

Two bonded yards for railroad iron have been established at Detroit for the accommodation of the Grand Rapids and Indiana Railroad Company who are receiving large quantities from abroad.

There has been a large falling off in the business of ship-building in Maine this year. Instead of from twenty to thirty first-class ships, as has heretofore been the case at Bath, only seven ships of 1,200 tuns each have been built this year.

There are 557 woolen mills in the seven states of Ohio, Michigan, Indiana, Illinois, Iowa, Wisconsin, and Minnesota. Their aggregate capital is $5,448,000.

The Taunton Machine Company is to build a pulley for its own use which, will be 30 feet in diameter, and the pit lathe in which it is to be constructed, it is said will cost over $5,000.

There are ten factories in St. Louis engaged in the manufacture of hide-covered saddletrees which are principally sold in New York, Newark, and Philadelphia. The wood used is mostly hackberry and sycamore, which is very soft when green and easily worked but which hardens very fast.

Mount Vista, about ten miles from Saratoga, a bluff rising directly from some table land to a hight of 500 feet, is found to be composed of a pure white sienite granite, equal or superior to any Eastern granite for monumental or other purposes, with a grain so fine that after dressing it resembles marble.

An iron mountain, five miles long and two hundred feet high, has been found in Cobden, Ill. It is within three miles of the Illinois Central Railroad and a large part of the land belongs to that corporation. The iron crops out all along the ridge and is of extra purity.

The St. Louis bridge over the Mississippi is expected to be completed by the summer of 1871, and the St. Louis merchants are anxiously awaiting the day. Now it costs them twelve cents a barrel to send flour 1,500 yards across the river, while it costs only twenty cents a barrel to send it to New Orleans, 1,200 miles below.

The Government machine shop at Charlestown, Mass., has just completed the largest planing machine in the United States, and they think, the largest in the world. It will plane a piece of iron forty feet long, twenty feet wide, and twenty feet high. One of the bed pieces weighs over forty tuns. Seth Wilmarth, the master machinist of the yard, was the designer.

It is only fourteen years ago that a grand excursion was made to St. Anthony's Falls, on the completion of the Chicago and Rock Island Railroad, in celebration of the finished railroad connection of the Atlantic and the Mississippi, and yet to-day, there are no less than twenty-five railroads that strike that great river between St. Louis and St. Paul.

The grasshoppers were so thick on the Missouri Valley Railroad track as to cause the wheels to slip and delay the morning train two hours on the 11th inst. It was several times necessary to stop the train and sprinkle dirt on the track to make the wheels bite.

The Reading Railroad Company own 16,355 cars of all kinds, and 288 locomotives. Were these all placed in one line upon the track they would make up a train forty miles in length. The greatest distance yet run by any engine of the company has been accomplished by the engine Atlas, which has traveled 263,000 miles, or about fifteen times the earth's circumference.

Lynn has shipped 25,800 cases of shoes during the past three months slightly in excess of last year's shipment. The total number of pairs in this immense pile would be about 2,118,000, and the aggregate value $2,961,000.

In the Illinois Penitentiary eight hundred convicts are employed in mechanical trades. Two hundred and fifty are in the cooper shops, ninety make shoes, forty-four make cigars, and there are thirty harness makers.

The Everett Mills, in Lawrence, Mass., run 50,000 spindles, employ 1,000 hands, use every week 12,000 pounds of wool and 20 000 pounds of cotton; and produce in the same time, 100,000 yards of goods, principally flannel shirtings, cotton and cotton wool fabrics, dress goods, and shawls.

Work upon the Iron Mountain Railroad between St. Louis and the South is going on rapidly. Track laying will be finished to a point four miles below Farmington within sixty days, and the track has already been laid from Belmont to Charleston. Fifteen hundred men are employed upon the line in and at the tunnel, fifty miles from Bismarck; four sets of hands are constantly employed working night and day. This tunnel is twelve hundred feet in length.

Experiments have recently been made at the camp of Lyons on the bodies of dead horses, with the view of ascertaining the precise character of the wounds produced by conical bullets discharged by the Chassepot muskets. It is said that the aperture made by the projectile at the moment it penetrates the flesh is commonly no larger than an ordinary pea, but that the rotatory movement of the ball revolving on its axis gradually enlarges its circles until it makes a hole into which a person could thrust both fists.

CHROMATE OF IRON.—This mineral, which is found so abundantly in Maryland and Pennsylvania, has recently been used for alloying iron and steel to considerable extent, and with highly satisfactory results, the steel made from the mixture being the hardest known. Works for its manufacture have recently been erected, and a company formed whose capital is $400,000, which are in active operation. The extension of the use of this mineral for hardening various manufactures of iron is now under experiment; and if the results prove satisfactory, the consumption of chrome ore, or chromate of iron, as it is technically termed, will be greatly increased.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

LAMP FEEDER.—T. P. Gibbons, Baltimore, Md.—The object of this invention is to provide a cheap and convenient device by which lighted lamps can be filled at any time with perfect safety.

SNOW PLOW FOR RAILROADS.—Jenkins Jones and T. G. Eiswald, Providence, R. I.—The object of this invention is to construct a snow plow for railroads which shall operate more easily and effectually than those heretofore in use, and by which the snow may be thrown upon either side of the track, as may be desired.

STOVE.—Henry D. Snyder, Carbondale, Pa.—The object of this invention is to so improve the culm or anthracite burning stove, that better combustion of the fuel will be effected, and the heat be better radiated than heretofore, while the outer wall of the stove can be opened all around the fire box so as to diffuse the cheerful radiance of the fire on every side. The stove can, also, be readily changed and adapted to burning different kinds of coal and wood.

WATER ELEVATOR.—C. F. Woodruff, Newbern, Tenn.—The object of this invention is to furnish a simple and neat device by which, after raising a bucket of water from the well, the bucket can be readily and conveniently lowered into the water again without reversing the motion of the crank by which it was raised. This device is an improvement on one patented by the same party Feb. 4, 1868.

CLOTHES WRINGER.—Josiah Webb, Spartansburgh, Pa.—This invention consists in the peculiar method of constructing and arranging the compressing rolls, whereby the water is more completely expressed from the clothes, and whereby, also, the rubber coating of the rolls can be easily adjusted and tightened when it wears loose.

PROCESS FOR PREPARING SULPHATE OF BARYTES.—Page and Krausse, St. Louis, Mo.—This process is a simple and effective series of operations for treating the mineral known as sulphate of barryta or heavy spar, so called whereby the mineral is refined and reduced to a fine powder known in commerce as sulphate of barytes.

GUIDE FOR SCROLL SAWING.—G. W. Staats, Newcastle, Pa.—The object of this invention is to enable irregular figures and curves to be sawn from wood by a scroll saw without the necessity of working to a line, which latter operation is properly performed by a skilled workman, beside requiring the figure to be marked to the wood to guide the operator.

GROUND AUGER MACHINE.—Jacob M. Walter, and Samuel Shank, Springfield, Ohio.—The object of this invention is to provide a machine for boring post holes in the ground, which is effective, easily and conveniently operated and adjustable to operate upon side hills. It consists of a hinged auger shaft whereby the earth lifted by the auger may be conveniently deposited away from the hole, together with windlass and cord mechanism for lifting the auger shaft vertically from the hole. It further consists in the form of the boring disk, and hinged or pivoted uprights supporting the boring and lifting mechanism, the said uprights vibrating in contact with slotted semi-circular plates affixed to the bed frame of the machine which serve in conjunction with clamp borers and screw studs in the uprights to adjust the uprights and the auger shaft in a vertical position when the hole is to be bored on a side hill and the bed frame is necessarily inclined from the horizontal.

TENONING MACHINE.—William McKnight, Clearfield, Pa.—The object of this invention is to provide an apparatus by means of which tenons of any suitable angle and slope, both in the tenon and shoulder of the same, may be cut in an expeditious and accurate manner. It consists of a frame having devices for adjusting and holding the wood to be cut in such a manner that the tenon when cut will be straight or tapered, or the shoulders of the same will be straight or mitered as may be desired and having, also suitable guides for the plane. It further consists of a tennoning plane having a shear iron, in combination with the frame above mentioned.

SAWING MACHINE.—Samuel Yarion, deceased, Corunna, Mich.—This invention refers to a portable machine designed more particularly for felling trees and for cutting the same up into dimensions suitable for portability or for consumption as fuel, and is peculiarly simple and effective in accomplishing the same.

LIFTING MACHINE.—Andrew Kriebel Hereford, Pa.—This machine has for its object to furnish a simple, cheap, and convenient machine, designed especially to enable the end of an endless chain horse power to be easily and conveniently raised by one man, to receive the trestle, so as to give a proper inclination to the endless chain of the machine.

WAGON JACK.—E. R. Baldwin, Southfield, Mass.—The object of this invention is to provide a wagon jack that may be operated with greater ease than those now in use, and which is more especially adapted for raising heavy trucks and carts which stand low, but which may also be used with equal facility for high and light wagons.

SEED COVERER.—E. D. Cramer, Hackettstown, N. J.—This invention relates to a new device for covering the seed behind a planting or seeding machine, and consists of a triangular frame which rests on three or more wheels and which is attached behind a planter or seeding machine, so as to follow its motion. On the two sides of the frame, which converge directly in front, are secured metal plates that are up and down adjustable these plates acting as scrapers for covering the seed.

ADJUSTABLE CARRIAGE POLE.—M. A. Koon, Catskill, N. Y.—This invention relates to that class of carriage poles which can be adjusted to carriages, sleighs, or other vehicles, in which the clips may be set at any suitable distance apart and to any length of axle.

CORN HARVESTER.—Nelson Newman, Springfield, Ill.—This invention relates to a new and improved device for picking the ears of indian corn from the standing stalks.

COMBINED CORN PLANTER AND CULTIVATOR.—John S. Mason, Coal Run, Ohio.—This invention relates to a combination of a corn planter and cultivator, and it consists in a peculiar construction and arrangement of the same.

WRENCH.—Luke Chapman, Collinsville, Conn—This invention has for its object to furnish an improved wrench, simple in construction, comparatively inexpensive in manufacture, strong, and convenient.

ANGULAR SHAFT COUPLING.—John M. Case, Worthington, Ohio.—This invention has for its object to improve the construction of my angular shaft coupling, patented March 10, 1868, and numbered 75,264, so as to make it simpler and cheaper in construction, and equally efficacious in use.

PLAYING CARDS.—J. J. Levy, New York city.—This invention relates to a new manner of forming the edges of playing cards, for the purpose of facilitating the shuffling of the same, and to prevent them from splitting. It also consists in providing the cards with beveled edges when double beveled or single, so that they are narrower at the edge than in the middle.

BEEHIVE.—Orrin Field, Independence, Iowa.—This invention consists in a peculiar construction of the hive, the manner of arranging the comb frames, etc, whereby a very desirable hive is obtained, all the comb frames rendered very accessible, and all of them rendered capable of being renewed when necessary.

PACKING, PRESSING, AND WEIGHING WOOL, ETC.—A. W. Fox, Columbiaville, Mich.—This invention relates to a machine for packing, pressing, and weighing wool and other similar substances, and it consists in a novel construction and arrangement of parts.

REFRIGERATOR.—Wilson Bray, Stockton, N. J.—This invention relates to an improvement in refrigerators, and the improvement is applicable to railway provision cars as well as to stationary refrigerators, both on a large and small scale.

HEATING RAILWAY CARS BY STEAM.—W. B. Farwell, New York city.—This invention relates to certain improvements in heating railway cars by steam taken from the boiler of the locomotive by which the cars are drawn.

WAGON AXLE.—C. D. Bachelder, Camden, Me.—This invention consists in providing an oil recess in the body of the journal of the axle, and a sleeve which is put on over the axle oil tight, to confine the oil in the recess, having a slot communicating with the recess in the axle through which the oil is fed by a wick to the wearing parts.

CONSTRUCTION OF CHAIR SEATS.—E. L. Buckingham, Jefferson, Wis.—This invention consists in a method of fastening the rod or splint to the frame of the seat by providing oblique slots through the rails from about the center of the inner edge, downward and outward, terminating in the bottom face of the rails near the outer edge, and in passing the strips of which the bottom is to be woven through the said slots, instead of through vertical holes, as heretofore; and it further consists in providing tenons on the back ends of the side rails, to be secured in corresponding holes in the hind posts.

KITCHEN IMPLEMENT.—Charles S. Westland and John B. Allen, Providence, R. I.—The object of this invention is to provide an implement available both as a stove-plate lifter and a holder for knives, forks, and spoons, which latter will, when so held by the implement, be conveniently accessible to the person employed in cooking.

BLOCKING CHAIN.—Peter Kendrick, Trenton, N. J.—This invention relates to a device for facilitating the driving of wooden blocks in chains, such as are used for mining purposes.

SULKY PLOW.—J. R. McConnell, Marengo, Iowa.—This invention relates to a sulky plow, and it consists in a peculiar construction of the same, whereby ease of draft, uniformity in the depth of furrow, and complete control over the machine by the driver, is obtained.

DEVICE FOR CONDUCTING GRAIN TO THRASHING MACHINES.—A. W. Lockhart, Sacramento, Cal.—This invention relates to a device for conducting grain, from the stack or from wagons, to trashing machines, thereby effecting a great saving in labor in thrashing grain.

STEAM ENGINE.—Thomas A. Nizer, Hamilton, Ohio.—This invention relates to that class of steam engines which are known as rotary engines, and it consists in a novel construction and arrangement of parts.

GAS APPARATUS.—John W. Brown, Wooster, Ohio.—This invention relates to improvements in apparatus for generating and purifying coal gas, for illuminating and other purposes, whereby the apparatus is adapted to household or domestic use, and the flow of gas to the gas holder is regulated automatically, and the surplus gas used as fuel.

MACHINE FOR STUFFING COLLARS.—William Fauntleroy, New Harmony, Ind.—This invention consists of a collar board pivoted centrally on a suitable bench, whereon the leather portion of the collar is stretched and secured with both ends open, and a pulley made to operate by a foot lever, over which a belt works, to which a stuffing mandrel is connected, which is guided by one hand, while by the other the straw on the filling is fed into the mouths of the collar, and the strap actuates the mandrel to pack the filling. When the collar has been filled at one end to the center, the collar board is swung around to present the other end to the operator.

MORTISING AND SLOTTING AUGER.—Peter Cunningham, Eckley, Pa.—The object of this invention is to provide an auger with which the operations of mortising and slotting may be performed rapidly. Patented Sept. 1, 1868.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

W. L. B., of N. Y.—There is nothing that will remove rust from polished steel and leave a smooth surface. Iron rust is dissolved by acids, but they will attack the polished metal. The only remedy we can recommend is repolishing.

A. J. G., of Kansas.—The amount of water that can be raised to a given hight by the hydraulic ram, working under a given head, is limited only by the size of the ram and the supply. Hydraulic Rams are manufactured by W. and B. Douglass, Middletown, Conn.

J. J., of Ill.—If wheat is not allowed to sweat before grinding, the flour will sweat after grinding; but this may take place without injury or loss more than is usual in the complete drying of the grain. We believe the best flour is made from wheat which has passed through this stage before grinding. The bolting cloths made in Holland are of silk, instead of thistle fiber as you have been informed.

M. H. R., of Mass.,—All other things being equal, increased length of a water pipe diminishes the flow. In your case, if we understand it, the flow through the aperture at the junction of the pipe with the cistern depends upon the pressure of the water in the reservoir. Beyond a length sufficient to compensate for the contracted vein a pipe will be of no advantage.

F. C. C., of Me.—There are different theories in regard to why the ocean is salt. Some think there may be large deposits of salt somewhere at the bottom of the ocean which by dissolving have rendered it salt. Some think that the sea obtained its salt at the time the globe was in the act of subsiding from a gaseous state. We are better satisfied to believe that it results from the evaporation of the water which is constantly flowing into the sea, which, although it may appear fresh to the taste, always or nearly always contains more or less salt absorbed from the earth during its flow. In this view the ocean bed is a immense caldron in which nature has been boiling away water for ages; the salt remaining in the kettle, precisely as it does in the saltworks, only very much slower.

G. W. B., of S. C.—A good waterproof cement may be made simply of powdered clay, dried by a gentle heat and mixed to the consistency of a paste with boiled linseed oil. It may be thinned with turpentine, colored with ochres or other pigments, and used for covering metallic roofs.

M. A. K., of Conn.—We have frequently restored faded flowers by immersing a portion of their stems in very hot water and allowing them to remain until the water is cool; then, removing them, cutting off the scalded portion of the stems and placing them in a vase of cold water.

A. H., of R. I., says that sawdust is the best bedding for horses he has ever tried. It possesses all the qualities necessary; it is an absorbent, a deodorizer, and a fertilizer, keeps the horse's skin in a healthy condition, and does not contaminate the clothes of the attendant with offensive smells.

P. T., of Mass., says: "Having seen in the SCIENTIFIC AMERICAN several notices of attempts to procure a substitute for ivory in the manufacture of billiard balls, my attention has been drawn to the subject, and I am surprised that no attempt has been made to utilize the seeds of the *macrocarpa*, or *microcarpa*, a sort of palm growing in the valleys of the Peruvian Andes. These seeds, large enough for billiard balls, have an apparent structure similar to bone, but are hard and elastic like ivory. I think they might receive and retain color; they can be handsomely polished."

Business and Personal.

The charge for insertion under this head is one dollar a line.

NEW PUBLICATIONS.

CONSTRUCTION OF IRON ROOFS. By F. Campin, C.E., member Nat. Acad. Great Brit., etc. New York: D. Van Nostrand, 192 Broadway.

The increasing use of iron in the construction of buildings, and especially in the construction of self-supporting roofs, combining lightness and strength, seems to make this treatise of peculiar value at this time. The subject of iron roofs is treated practically and also theoretically, the formulæ for strain being equally applicable to timber structures. The volume is illustrated with eight plates, showing the details of such work, taken from buildings actually erected.

AMERICAN HOUSES. A Variety of Original Designs for Rural Buildings. Illustrated by Twenty-six Colored Engravings with Descriptive references. By Samuel Sloan, Architect. Philadelphia: Henry Carey Baird, 406 Walnut street. Sent free of postage on receipt of $2.50.

The object of this book, as announced by the author, is to present a number of designs in an attractive dress, that may either serve as models to build from, or criterions by which the projector may judge of the relative quality and merits of his intended edifice. It will prove of value to such as need some guide in forming a judgment upon designs, and who, meditating the erection of rural buildings, wish for some hints upon the subject before consulting an architect. Architects also will find useful studies in this book, and we especially recommend it to beginners and students.

A TREATISE ON OPTICS, or Sight and Light Theoretically and Practically Treated, with the Application to Fine Arts and Industrial Pursuits. By E. Nugent, C. E. With one hundred and three Illustrations. New York: D. Van Nostrand, 192 Broadway.

This is a work written in popular and pleasing style, and adapted to the wants of those who have not time or the preliminary education requisite for the study of larger works. To all such we can recommend it.

Improvement in Hanging and Retaining Center-Boards.

For shallow water, and also for deep water when vessels of great relative breadth of beam and slight immersion are employed, the center-board is invaluable, holding, while in use, the vessel closely to the wind, without impeding its motion through the water. There are some objections to its use, the principal owing to the method of hanging the board, allowing leakage and its consequent dangers and annoyances. The usual method is simply to drive a pin through the walls of the well or trunk and the board, which in time becomes corroded and loosened, and when the board is to be removed must be driven out from either side.

The engraving presents a view of an improved plan of hanging the center boards of vessels for which a patent was issued January 8, 1867. The trunk, A, is of usual form, the board or blade, B, hung on a pivot at C. This pivot is a simple pin of steel, iron, or composition, having its bearings, not in the walls of the trunk, but in a screw socket or nut seen enlarged in Fig. 2. The hole in this socket for the reception of the pin is not bored through, but the nut end of the socket forms a cap. The shank of the socket nut has cut on it a sharp thread for seating into the wood of the trunk, and the inner side of the flange is formed into a sharp annulus or ring that seats itself into the outside of the trunk, forming a ring, as at C, and making a perfectly water-tight joint, entirely preventing all possibility of leakage. If thought advisable, a flange or gasket of rubber or leather may be introduced under the flange of the socket nut. The pin, bearing entirely on the metal of the sockets, may be lubricated, and to prevent wear the orifice through the blade or board may be lined with a metallic sheath. When it is necessary to remove the board, it may be done simply by unscrewing one of the nuts and taking out the pin, which is perfectly loose.

Fig. 1

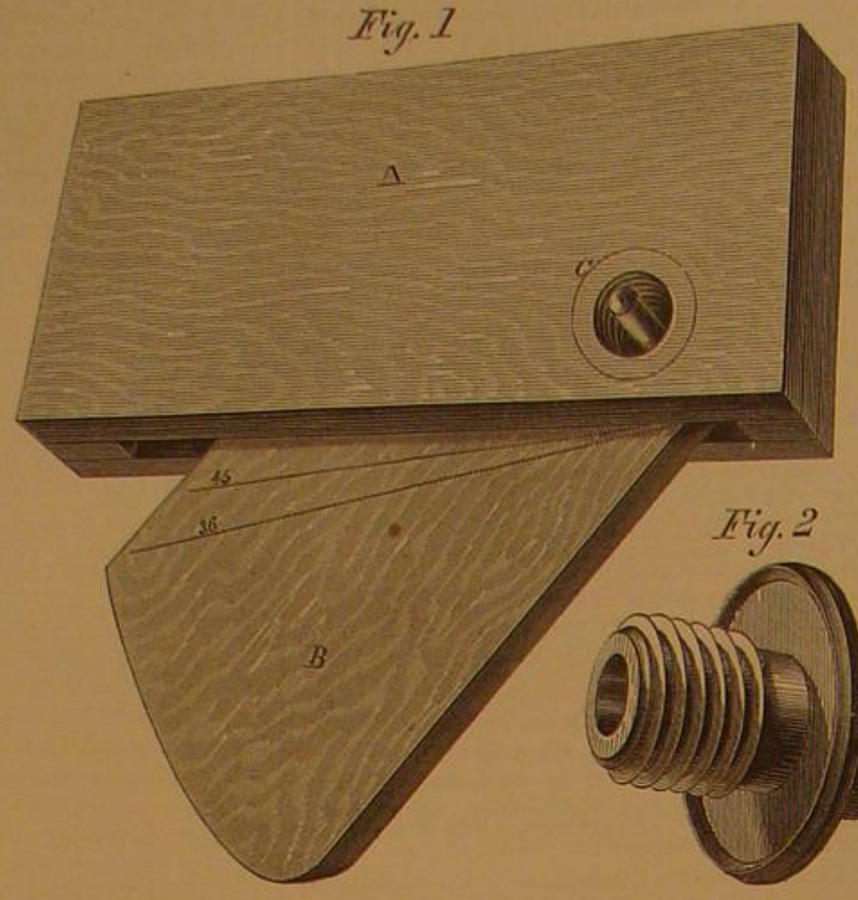


Fig. 2

STORER'S PATENT CENTER-BOARD ATTACHMENT.

This device has been thoroughly tested for over two years—before the date of the patent—by sailing masters, and owners of yachts, fishing and pleasure boats, and has proved satisfactory to each and all. It has been found to be a device saving time and annoyance, and considered to be better in every respect than the ordinary method of hanging center boards.

Letters may be addressed to either of the patentees, George Storer, or George W. Storer, at Middletown, Conn.

Improvement in Car Coupling.

The inventor of the coupling shown in the accompanying engravings has for his object to furnish a simple, convenient, strong, safe, and reliable car coupling, which shall also be so constructed as to uncouple itself should one or more cars of a train be over-turned or thrown from the track. Fig. 1, is a plan or top view of the contrivance: Fig. 2, a longitudinal vertical section with the coupling block engaged, and Fig. 3, the same with the coupling disengaged.

A is the coupling bar having near its end a long slot, in the forward part of which is pivoted the block or catch, B. C is a spring the rear end of which is secured in a slot in the coupling bar, and its forward end resting in a notch in the middle of the rear side of the block, B, its object being to hold the block at right angles to the line of the bar. D are parallel spring bars, the rear ends being attached to the draft bar of the car, and projecting at a distance apart equal to the thickness of the coupling bar. These springs are mortised to receive the length of the coupling bar between their jaws. One of the spring bars, D, is mortised or beveled in the line of the proposed movement of the coupling bar and its catch-block, so that when the cars are run together, the bar, A, and coupling block, B, may engage with the spring bars, D, the latter being forced into place by the spring, C. The cars will then be securely coupled, while sufficient transverse motion is allowed for the rounding of curves, etc. If one or more cars "jump" the track the spring of the bars, D, will allow the block to be disengaged and the car to hold to the track without being carried by those before it to destruction. When in a line with the train and it is desirous to uncouple, it may be done by pressing down one end of the bar or block, B, to a position parallel with the length of the coupling bar, when it will readily slide out and disconnect the cars. If thought desirable, the spring bars, D, may be incased or covered to protect them and to guide the coupling bar in entering the space between them. The spring bars should be made of steel or of flexible iron.

Patented through the Scientific American Patent Agency, August 4, 1868, by Clinton R. Hardy, who may be addressed at Lexington, Ind., for territorial or manufacturing rights.

Fig. 1

Fig. 2

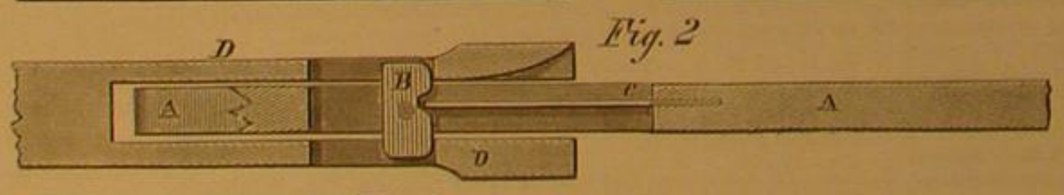
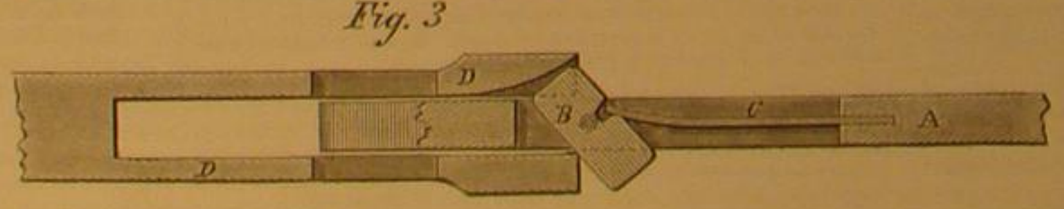


Fig. 3



HARDY'S AUTOMATIC CAR COUPLING.

DYNAMITE---REVIEW OF A PAPER BY M. NOBEL, THE INVENTOR.

M. Nobel, the inventor of dynamite, recently read an interesting paper upon the substance before the British Association, at Norwich, England. He stated that the name dynamite had not been given to this explosive by way of disguise, but on account of its peculiar explosive properties. Although it was nothing but nitro-glycerin absorbed by highly porous silica, its properties are so much altered as to warrant a new denomination. Dynamite consists of seventy-five per cent of nitro-glycerin, and twenty-five per cent silica. It might be supposed from its composition, that it would possess only three-fourths the explosive power of nitro-glycerin, the specific gravity of both being nearly the same. But practically there is no advantage in the greater concentration of the power of the latter substance. It cannot, or at least it ought not to be poured directly into the bore-hole, since it easily causes accidents by leaking into crevices, where it explodes under the miner's tools. It must therefore be used in cartridges which leave considerable windage; whereas dynamite, being somewhat pasty, yields to the slightest pressure, so as to completely fill up the sides of the bore-hole. For this reason, a given bore-hole will receive at a charge as much nitro-glycerin, in the form of dynamite, as in the liquid state.

M. Nobel then gave an extended account of the different experiments which had established the claims of dynamite to efficiency and safety. Most of these have already been placed before our readers, and we will therefore only allude to one of a somewhat extraordinary character, performed at Stockholm, in Sweden. A weight of 200 pounds was dropped from a hight of 20 feet upon a box containing dynamite, which was violently crushed without an explosion. This adds to the already accumulated evidence that dynamite cannot be exploded by percussion.

The inventor proceeded to say that the danger attending the use of nitro-glycerin, indirectly resulted from its liquid form. Much as has been written on the danger of congealed nitro-glycerin, he believes that if the solid form was its natural state at ordinary temperatures, we should hardly have had to deplore a single one of those fatal accidents which it has caused. He asserts that crystallized nitro-glycerin is not more sensitive to concussion than the liquid, and states that the reverse is the case in a remarkable degree. Nearly all the calamities referred to have occurred from leakage, which, owing to various causes—the principal of which is the tendency of this substance to expand by increase of external temperature—it is well nigh impossible to prevent. He states that he can hardly remember a cargo that has reached its destination without leakage. He thinks it wrong to blame nitro-glycerin for a practical difficulty of this kind, and supports his position by the fact that nearly all the accidents which have occurred (as at Aspinwall and San Francisco) have taken place when it was forwarded under wrong declaration, and consequently the necessity of cautious handling was not known.

It seems to us, however, that M. Nobel proves too much by these statements, and that they are much more likely to confirm the belief in the dangerous character of nitro-glycerin, than to convince the public of its safety.

The case is, however, different in regard to dynamite, which can be handled without danger, and is in no degree inferior in explosive power. There have been already fifty tuns of the latter sold, and reports are unanimously concurrent in its favor. The prominent point which ought to be considered in estimating the value of dynamite as a blasting agent, is the fact that a smaller bore-hole than has hitherto been required will contain a sufficient charge to perform a given amount of work, thus largely reducing the expense of drilling. It is estimated that at least one-third of the labor required when gunpowder is used, is thus saved, and, so far as we can form an opinion from the various reports we have seen, we are inclined to think this is within reasonable limits.

UNIFORM STANDARD FOR BOLTS AND NUTS—ITS ADOPTION BY THE NAVY DEPARTMENT.

We have before us the report of a board of naval officers appointed by Hon. Gideon Welles, Secretary of the Navy, March 28th, to investigate the different systems for forming the threads of bolts and nuts and their relative sizes. The board consisted of Chief Engineers Isherwood, Henderson, and Zeller, and Assistant Engineer Greene, of the Navy. They visited the establishments of the principal tool and machinery builders in Boston and Springfield, Mass.; Providence, R. I.; New York city, Newark, N. J., and Philadelphia and Pittsburg, Pa., and also addressed letters of inquiry to other localities. The result of their labors is a very exhaustive report, illustrated with tables and diagrams, together with mathematical formulæ, which will be found to be very interesting to machinists and engineers. After a thorough examination of the systems of Whitworth, of England, Sellers, of Philadelphia—known as the "American Standard" and recommended by the Franklin Institute—and that of Robert Briggs, the board recommended that of Sellers as the best. Accordingly the Secretary of the Navy, on the day after the receipt of the report—May 16th—ordered its adoption as the standard for the naval service.

The form of thread is that we have heretofore described and advocated, a V-thread with inclination of 60°, the top and bottom flattened equal to one eighth of the pitch. We append a table of the number of threads and the diameter of bolts:

Diameter of bolt.	No. of threads.	Diameter of bolt.	No. of threads
¼	20	2	4½
5-16	18	2¼	4½
⅜	16	2½	4
7-16	14	2¾	4
½	13	3	3½
9-16	12	3¼	3½
⅝	11	3½	3¼
¾	10	3¾	3
⅞	9	4	3
1	8	4½	2¾
1⅛	7	4½	2¾
1¼	7	4¾	2¾
1⅜	6	5	2½
1½	6	5¼	2½
1⅝	5½	5½	2⅜
1¾	5	5¾	2⅜
1⅞	5	6	2¼

The board, in concluding their report, say: "So far as we have been able to confer with engineers and manufacturers, either personally or by letter, we have heard but one opinion expressed in regard to the importance of uniformity of practice. Many have already adopted the Sellers pitch; others are gradually adopting it, while others still express their willingness to adopt it. A majority, we confidently believe, are now willing to adopt the Sellers *form* of thread also, provided it be made the standard.

"As a proper auxiliary we suggest the importance of having all necessary gages manufactured by a single establishment, as by that means only can entire uniformity be secured."

We regard this report and the consequent order as a step in the right direction. Whether there may be uniformity in the relative dimensions of the bolt shank and the head and nut or not, it is of manifest importance that there should be in the form and number of threads. The fractional pitch of the threads in the inch and five eighths and most of the sizes following may be considered objectionable by some, but it is no great difficulty to procure additional gears by which these grades can be cut by almost any leading screw; beside, these large sizes are not so frequently used as the smaller sizes. The recommendation that the gages should be made by one concern, for the sake of uniformity, we also approve.

This American Standard departs less from the proportions generally in use in this country than any other standard, and this is another argument in its favor. As to the form of the thread, we doubt if any other combines so perfectly the elements of strength, ease of production, and safety.

Buffaloes for the Central Park.—From a private letter just received from Abilene, Kansas, we learn that three full grown bisons captured on the plains are soon to be sent from that place to New York city as a contribution to the Central Park collection.

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Contents:

(Illustrated articles are marked with an asterisk.)

THINGS EASY AND DIFFICULT.

The easiest things to be done are not by any means the easiest things to be described, while on the contrary, those things which are most easily described are often the most difficult to accomplish. The more complicated the mechanism used to obtain a given result the more complicated and extended are the rules for its use and manipulation. Large volumes have been written upon the use of the steam engine yet a person of ordinary intelligence can soon learn to manage one of these iron giants. The operation of file cutting could be described in the space this article will occupy, yet it would take years of practice for any one to become a very successful file cutter. The two examples we have cited illustrate the important principle, that it is easier to learn the manipulation of a machine designed to perform any given work than to attain skill in performing the same work by manual labor.

In no department of the arts is this more manifest than in the use and manufacture of musical instruments. The violin, devoid of keys, composed of three elements, a sounding board or shell, strings, and the bow which agitates the strings, is in mechanical construction the simplest of all instruments having much scope or expression. It and the instruments of its class are correspondingly the most difficult to play of any known instruments, requiring the most laborious efforts, even on the part of those endowed with great musical genius, to arrive at perfection in execution and expression. The difficulties of learning to perform skillfully on the violin consist not in comprehending how to do, it is the *doing itself*. It is not the education of the mind but of the muscles that is difficult.

This leads to another important fact connected with this subject, namely, that in most cases the education of the muscles to delicate manipulation is more difficult than the acquisition by the mind of the principles which govern and direct it.

If then strength of will in the overcoming of difficulties is an element of greatness, the artist who can skillfully perform is greater than the critic who can only tell how work should be done without being able himself to put in practice his own teaching. This truth is felt by all competent workmen and is the cause of their impatience with the criticisms of men who are only able to approve or disapprove their work without being able to execute it themselves. Such impatience is fostered by the arrogance of critics, who imagine that they are superior to their hard-handed subordinates and put on airs accordingly. Let one of these doff his gloves and take his place at the lathe, vice, or planer, and show that he can do as well as direct, and the respect of those who submit to his dictations will be an assured thing. There are many of these kid-glove gentry in the mechanic as well as the fine arts. Professional critics, who can do nothing but look on in this age of progress, are not wanted. Young man, just emerging from your polytechnic institute, your school of mining, or chemical laboratory, remember that proportionally as you add practical knowledge to your other acquirements you will successfully control men and advance in station.

STREET DUST LAID BY THE USE OF CHEMICALS.

A patent was taken out in England, last September, relating to the application of a compound of deliquescent salts to the prevention of dust upon roadways. This season, extensive experiments have been made to test the value of the invention, and the results seem very favorable. It is estimated that it costs $500,000 dollars per annum to water the streets of London, and notwithstanding this enormous outlay, the dust cannot be laid. The demand for something more effectual has given rise to the invention referred to. The composition used is from ½lb. to 1 lb. of the mixed chlorides of calcium and sodium to one gallon of water. The salts are put in the cart and the water is then taken in. By the time the cart is full, the salts are dissolved. Although we have had sufficient rain in New York and Brooklyn, as well as in other parts of the country, the season in England has been remarkably dry, and consequently very unfavorable to the development of the principle upon which this invention is based, viz: the retention of moisture by the mixed chlorides. The reports, however, are remarkably favorable. It produces a most important effect upon the surfaces of macadamized roads, hardening and concreting the material in such a manner that when it is perfectly dry, no dust arises from the passage of ordinary traffic. The light dust always found upon a dry road surface, watered with plain water, is not to be seen. The surface remains firm with the absence of detritus. The roads are thus rendered more durable, while the chlorides being anti-putrescent, a sanitary advantage is gained, at the same time that economy in the use of water is secured—important considerations in all large cities.

The shopkeepers, along the streets where this composition has been used, have given their testimony in its favor. They state that, instead of having their shops filled with dust, they can scarcely see a particle, and on Sundays, while other streets are smothered in dust, they rejoice in immunity from this nuisance.

The chlorides used are cheap, and obtainable in large quantities. The chloride of calcium has not been in large demand heretofore, but can be manufactured to any extent. There seems no practical difficulty in the use of these salts, and we hope that a trial of them will be made in this country. The city of Calcutta, in India, is about to test the method. The dust is said to be intolerable there, and of a most damaging nature to clothing, etc., as the roads are made of brick, easily pulverized by the feet of horses and the wheels of vehicles.

THE EARTHQUAKE TERM.

Our mother earth is passing through one of those periods of convulsion the phenomena of which are among the most terrible of all the manifestations of physical forces. The throbbings of the earth crust, which have extended over so vast an area during the last twelve months, the meteoric shower, and the meteorological phenomena during the same period, are together an interesting subject of study. What mysterious connection exists between these occurrences, if any does exist, or rather the real nature of it, has never been satisfactorily shown; and there is yet, perhaps, room for skepticism upon the hypothesis that the cosmical matter from which the enormous number of meteors periodically rain upon the earth's surface has any direct agency in these disturbances. That the weather and other atmospherical phenomena are influenced by some cause acting in concert with the causes of earthquakes, if not by the same causes, must be admitted. It would be interesting to review in this connection the histories of some of the most remarkable earthquakes on record; we will, however, allude only to one, which destroyed the city of Caracas, in Venezuela, in 1812. The shocks of this earthquake continued at intervals for months previous to the above catastrophe, and were felt with more or less violence from the mouth of the Ohio river to that of the St. Francis, in the United States. Fissures were opened, lakes disappeared, trees were felled, and such changes produced in the general appearance of the surface that a tract 70 to 80 miles in length and 30 miles wide along the Whitewater river and its branches has ever since been called the "sunk country." The traces of the fissures and chasms produced at that time were visible for years, and were noticed by Flint, the geographer, seven years after their occurrence, and Lyell, the geologist, as late as 1846. Such were the effects of this convulsion in our own land. Throughout Mexico and Central America they were still more remarkable, increasing in intensity as they extended further south, finally terminating with the destruction of Caracas, which involved the almost instantaneous death of 12,000 people. The atmospheric phenomena during the period preceding the final great convulsion was exceedingly peculiar. Electrical discharges from an apparently cloudless sky were frequent. Vivid auroral displays were more than ordinarily common. At New Madrid, below St. Louis, the inhabitants were at one time surprised and alarmed by the appearance of the sky, which although cloudless, presented along the western horizon a most brilliant electrical display. A continued glare of most vivid lightning, accompanied by what was at the time supposed to be incessant thunder, appeared to proceed from below the horizon, and coupled with the preceding alarming events, produced great terror in the minds of the people.

The present season has presented great climatic peculiarities. From all parts of the world come accounts of hurricanes, floods, unusual vagaries of temperature, and prevalence of winds from unusual quarters. The *Scientific Review*, speaking of the extraordinary heat and drouth experienced in England, says: "The southerly winds have prevailed for an unusually long interval, and the weather has consequently been very hot and very dry. On the 22d of July it was possible to cook a beef steak on the south side of Westminster Bridge by the heat of the sun's rays alone. The apparatus employed was of a very simple kind; it consisted of an empty cigar box, the inside of which had been blackened, and the top closed with three panes of glass about one inch apart. In the course of twenty minutes the steak was done on both sides, while a few potatoes were baked around it."

With the south winds and the extreme heat in England have appeared the mosquito, which threatens to become a pest in a country hitherto exempt from that annoying insect. The peculiarities of our climate during the last twelve months have attracted much attention. Both extreme cold and heat have been experienced, and these extremes have continued for extraordinary periods, while we have had unusual storms of wind and rain. All this indicates unusual atmospheric disturbancs. Overhead and underfoot the elements are warring with terrific energy. The recent eruption of Vesuvius, the earthquakes in the West Indies and the Sandwich Islands, the meteoric fall of 1866 and 1867, the alleged shifting of the Gulf Stream nearer to the eastern continent, and above all the accounts just received of the disastrous earthquake in southern Peru and Ecuador, exceeded in destructive effect by only two similar events on record, constitute a series of remarkable occurrences which may not perhaps be rashly regarded as the commencement of an epoch of permanent physical and climatic change to which the earth is destined. Some will see in these events the fulfillment of prophecy, and the indications of moral and political changes not less momentous.

The causes which produce the grand and terrible phenomena of earthquakes are doubtless various. The generation of gases by chemical reaction, and the development of enormous volumes of superheated steam, by the contact of water with the intensely heated interior of the earth, are without doubt the most common and potent. The distance below the surface at which these forces act, although undoubtedly great, is unknown. The sensations produced upon people by earthquake shocks have peculiarities which must be felt to be realized, as it is impossible to give any adequate description of them. The most graphic description we have ever heard, was given to us by a gentleman who has experienced several of these occurrences both at sea and on land. The sensation at sea he says is often described as resembling the shock produced by a ship's striking upon a reef, but there is a feeling of something different, a sort of instinct of something further away and more powerful, which accompanies the first feeling of surprise and alarm, a sort of mysterious pulsation through the water, which once experienced is not easily forgotten. On land he describes it as being like what would be the feeling of a person standing upon a flexible, buoyant substance, like an immense tarpaulin spread over the surface of a liquid mass in a state of violent agitation. The undulations succeed each other so rapidly and irregularly that it is impossible to time one's steps to meet them, persons are suddenly and violently prostrated, while the mysterious subterranean noises, the peculiar appearance of the sky and atmosphere, the universal alarm of all living things, conspire to produce the most appalling spectacle that the imagination can conceive.

The accounts received from Ecuador and Peru indicate a disaster of almost unparalleled extent, and the misery which must inevitably result will appeal to the sympathy and the charity of the entire civilized world. Whether it will prove the grand finale of the present earthquake term, or whether other disasters are to follow, no mortal can say. Time only can determine this, but we trust that the giant forces which have produced such wide spread devastation and death have expended their energies, and the earth may again "rest for a season."

INQUISITIVENESS---OUR CORRESPONDENTS.

Most people are inclined to think inquisitiveness a very disagreeable characteristic, and it must be admitted that when it expends itself upon the acquisition of a minute knowledge of other people's business, no other adjective can be found which seems more applicable, unless it be some which are prohibited in polite intercourse. But although in personal and private concerns this quality renders its possessor an unmitigated nuisance, in matters of science and philosophy it is the prime motor. The great discoveries that have ever been made have resulted from inquisitiveness. There are those who seem to believe that *acquisitiveness* is the great stimulus to progress, and we do not deny that it has had a large share in initiating and forwarding the enterprises, and improvements which characterize the present age; but before acquisitiveness will induce men to aid in the investigation of any subject, the inquisitiveness of those who demand from nature the revelation of her mysteries, must be rewarded by such plain and direct responses, as to give some warrant for the assumption of pecuniary risks.

Such inquisitivenes is the chief attribute of philosophical minds. It has stimulated the Newtons, Watts, Franklins, Faradays, and Ericssons of past and present ages to plunge into the most laborious and complicated investigations, for their own sake. The search after knowledge, for the pure love of it, is what has paved the way for all the great achievements which have so ameliorated the condition of mankind.

The position of this journal, upon the relative merits of of practical science and speculative philosophy, must be well understood by our readers. We have been opposed to abstract speculation beyond certain limits, and except for the purpose of opening the way to real and earnest investigation of facts. The inquisitiveness of which we speak is never satisfied with hypotheses. The positive or negative response of actual experiment is its ultimatum, and until that be reached it will not be content. No man, however gifted by nature or improved by culture, can be perfectly sure that in forming a theory he has embraced all the facts which relate to it. Prof. Tyndall has said, that "the true physical philosopher will never rest content with an inference, when an experiment to verify or contravene it is possible." We are daily in receipt of theories upon all manner of subjects—some of them crude, some of them remarkably ingenious. That the most of

these are not published is perhaps a matter of surprise to our correspondents. We are always glad to publish anything that we consider suggestive, or likely to lead to useful research. Many communications, although they may contain entirely erroneous statements and false reasoning, are noticed because they afford an opportunity for the imparting of useful information, or the correction of popular errors. Our readers would be surprised, were we to merely give the titles of some of the communications we receive. Here is a correspondent who writes us upon the duality of sex in the human brain; another who thinks there is a relation between the phenomena of thought and the planets Venus and Mercury; still another who most dogmatically states that he has without experiment, by pure reasoning, discovered the relation of matter in its ultimate condition, and wishes us to occupy four columns of space with his ideas upon the subject. In striking contrast with these is one from a school-boy, asking for information upon a subject which shows that he is inquisitive in the right direction, and couched in language which gives evidence of improved opportunities, and large promise for the future. Welcome, my lad! Your inquiry shall receive attention in due time, while other more pretentious, but far less valuable correspondence, finds its way into the waste-basket.

COPPERED IRON ROLLERS FOR CALICO PRINTING.

The last number of the London *Mechanics' Magazine* says, that to save a portion of the large amount of capital invested in copper printing rollers by calico manufacturers which lies necessarily idle, "the Swiss printers have been experimenting," and with complete success, with iron rollers coated with copper of sufficient thickness to allow of the pattern being engraved upon it. The mode of coating adopted by the Swiss is said to be a secret; but there are several plans by which a thin layer of copper can be obtained upon which as much metal as may be wished can be thrown down by the ordinary electrotype process. We have published several modes of coppering iron already, and add one more devised by Weiskopf. He first brushes the object (say roller) over with a solution made by dissolving one part of nitrate of copper in fifty parts of hydrochloric acid; and afterward with a second solution of ten parts nitrate of copper, ten parts chloride of copper, and eighty parts hydrochloric acid. This latter solution is applied very quickly with a soft brush. The copper is deposited in a few seconds, and the object must be rinsed immediately in cold water and wiped with a soft cloth. By repeating the application of this second solution the copper coating may be obtained of any desired thickness. This process, the author says, is to be recommended for its simplicity, cheapness, and the durability of the copper layer. Our own experience with the coating of copper with acid solutions similar to this has shown us that unless the application be made very quickly indeed, the copper does not adhere firmly to the iron and is apt to blister and peel off. For coating rollers, therefore, we should recommend an alkaline process—either Weil's or the old cyanide plan. When the pattern is out of date, the Swiss convert the old roller into a new one by covering all parts of the roller except the engraved pattern, with an insulating varnish, then immersing it in a bath, to fill up the pattern with freshly deposited copper. The roller is then ready to have a new pattern engraved upon it."

We can scarcely reconcile the two statements in the above extract that the Swiss process is a "secret," and that they "immerse the roller in a bath" to fill up, by deposition, the depressions of the engraving. We have, also, very little faith in coating iron rollers with copper for calico printing by the electrotype process. Several plans for coating iron with copper by deposition have been proposed, but we have yet to know of any that have been entirely successful—that is, have produced a perfect homogeneous and solid coating. It is almost impossible to make the surface of the iron so chemically clean and to so free it from all minute irregularities that the copper will combine with it and secure a perfect copper covered surface. The colors used in printing frequently contain acids, and if the slightest pin hole exists in the copper covering these acids would certainly affect the colors by the oxidation of the iron, and tend to undermine the copper.

The rollers used in calico printing are hollow, to receive a mandrel, but are composed entirely of copper. When the pattern engraved on a set of rollers has been used sufficiently, the roller is turned in a lathe to remove the engraving, and then ground and polished. Thus the roller may be used for a large number of patterns, being re-engraved and turned until the shell becomes too thin. The worn out roller and the turnings are worth nearly if not quite as much as pig copper to be wrought over again.

We have often thought that iron rollers might be substituted for those made entirely of copper, having a casing of copper—not, however, deposited by the battery—but a sheath or hollow cylinder of copper might be forced upon the iron core by hydraulic pressure and made of sufficient thickness to be engraved and used for printing a number of times. This would seem to be more reasonable than the plan proposed by the *Mechanics' Magazine*, as it would be certain to secure solid metal for the reception of the engraving.

THE QUALITY OF ILLUMINATING GAS.

In looking over our exchanges we notice frequent complaints in regard to the poor quality of illuminating gas furnished by the different gas manufacturing companies. These complaints are not confined to particular cities, but seem to be nearly universal. Some seem to cling, however, to the idea that it is not the quality of the gas that is at fault, but the meters. In an article entitled "Gas Measurement," published on page 337, Vol. XVIII. of the Scientific American, we showed that the meters were unjustly blamed for the want of uniformity in the expense of illumination through corresponding portions of the year, and that the real fault was to be referred to the inferior quality of gas furnished by the manufacturers.

It is not unfrequently the case that the standard of quality is allowed to sink so low that three feet of gas give no better illumination than two feet of the proper quality ought to give. The three feet of poor gas cost the producers but little more than two feet of good gas, and the companies add largely to their dividends by the fraud. When the murmurings of the public begin to be troublesome and seem to threaten opposition, up goes the standard, and the clamor subsides for a season.

It is high time that a remedy for such wholesale imposition should be prescribed. The standard of quality should be fixed by law, in lieu of anything better; but we are confident that our suggestion contained in the article above referred to would be a much better check than any legislation upon the subject could be. The suggestion referred to was the invention of a meter that should register for quality as well as quantity. The idea seems to us perfectly practicable, and the man who can invent a cheap and accurate apparatus by which the daily quality of gas, as well as its average quality for a given time, can be registered, would find a buyer in nearly every consumer of gas. With such tell-tales in every house, gas companies could not practice the irregularities hitherto complained of. People would know what they were buying and would be on an equal footing with the monopolists, who, not content with legitimate profits, seek to swell their gains by depreciating the quality of their products.

We know of no more promising field for inventive genius than this, and we are confident a rich reward awaits the inventor that shall succeed in supplying this growing want in all gas-consuming towns.

OFFICIAL EXAMINATION OF APPLICATIONS FOR PATENTS.

Applications for patents are distributed into thirty-six different classes under the following classifications:

I. AGRICULTURE. II. AGRICULTURAL PRODUCTS (Preparation of). III. BUILDERS' HARDWARE. IV. CALORIFICS. V. CARRIAGES. VI. CHEMICAL PROCESSES. VII. CIVIL ENGINEERING. VIII. CLAY MANUFACTURES. IX. COMPOSITIONS. X. FELTING AND HAT MAKING. XI. FINE ARTS. XII. FIRE-ARMS. XIII. GLASS MANUFACTURE. XIV. GRINDING MILLS. XV. HARVESTERS. XVI. HOUSEHOLD FURNITURE. XVII. HYDRAULICS AND PNEUMATICS. XVIII. ILLUMINATION. XIX. LEATHER MANUFACTURES. XX. MECHANICAL ENGINEERING. XXI. METALLURGY. XXII. METAL WORKING. XXIII. NAVIGATION. XXIV. PAPER MAKING. XXV. PHILOSOPHICAL INSTRUMENTS. XXVI. PRESSES. XXVII. PRINTING AND STATIONERY. XXVIII. RAILROADS AND CARS. XXIX. SEWING MACHINES. XXX. SPORTS, GAMES, AND TOYS. XXXI. STEAM AND AIR ENGINES. XXXII. STONE WORKING. XXXIII. SURGICAL APPARATUS. XXXIV. TEXTILE MANUFACTURES. XXXV. WEARING APPAREL. XXXVI. WOOD WORKING.

These classes are distributed to twenty principal examiners, and their assistants, and each class embraces a variety of subjects, as for example class thirty-six, devoted to "Wood-Working," contains nearly 500 modifications of machines and implements applied to that branch of industry. Now when an application for a patent is filed it goes to the class or subdivision to which it belongs, and is examined when that comes up, and not upon the plan adopted by the miller who grinds out his grist in regular rotation.

It would not be possible for an examiner to get through with his cases properly unless he should take up and dispose of all that relate to the same subject on his file. This explantion will enable applicants for patents to understand why some cases remain longer than others in the Patent Office.

PATENT OFFICE MATTERS.

Commissioner Foote has appointed James S. Grinnell chief clerk, in place of A. M. Stout, resigned. Mr. Grinnell was for several years chief clerk in the Agricultural Department, but more recently Examiner in charge of the class of Lumber in the Patent Office. He is a gentleman well qualified to perform the duties of the office, and his appointment, we are sure, will give satisfaction to inventors, and all others who have occasion to do business with the Patent Office. General W. H. Browne, of this city, has been appointed a First Assistant Examiner and assigned to duty with General Schoepf in the classes of Land Conveyance and Mechanical Engineering. Horace Binney, of Philadelphia, Pa., has also been appointed a First Assistant, and Emmett Quinn a Second Assistant Examiner.

The Commissioner, in order to reduce the expenses of the office, has notified a number of those engaged in the model rooms that their services will not be required after the 1st proximo; and there will also, we understand, be a reduction of the clerical force in the draftsmen's and other rooms, after that date.

Perpetual Motion.

An exhibition of a "Perpetual Motion" machine is now going on at Wilkesbarre, Pa., which seems to astonish the natives, if we may judge from the laudatory editorials of some of the papers in that region. One of our Wilkesbarre cotemporaries says:

"We are free to confess that we were disappointed in point of mechanism; it is one of the finest pieces of mechanism that we ever saw, and in a scientific point of view it is a puzzler, and worthy a visit from every mechanic and every philosopher, and we are satisfied that all will be pleased as well as astonished. To describe this wonder of the nineteenth century is a task, and beyond the possibility of description, and must be seen to be understood.

"The power is derived from four brass balls weighing each four and one-half ounces, operating upon a combination of levers so combined as to give the long end of each in favor of the power, and while the ball on one end is passing down by its own gravity through an arc of 90°, the other end of the lever, loaded with a ball of the same weight, is being carried up through an arc of 95°, the difference between the arcs being occasioned by the inclination of the planes by which the balls are conveyed from one end of the levers to the other. This excess of distance through which the balls pass on the end of resistance seems to be easily overcome by the third lever, which is attached to the second in such a way that it describes a greater arc than is described on the descending end, which seems a contradiction in mechanics, and yet it is so, and at the same time retaining the balance of power in favor of the end of power.

"While the ball in its descent is twelve inches from the fulcrum, the point of resistance is but one; it is therefore certain that whatever weight the descending ball may have, multiplied by the difference between the point of power and point of resistance, would give the potential power of the machine; and it is manifest that a ball of four-and-a-half ounces will exert an influence equal to fifty-six ounces on the machine. Wonderful as this may seem, yet it must be so.

"To describe this beautiful piece of mechanism, is out of the question, and the more we say seems only the more to bother the mind; we, therefore, advise those who are interested, if an opportunity offers, to go and see it and solve the problem for themselves. The man who ventures a negative opinion on any question in this nineteenth century, stands on slippery ground. We prefer to see rather than denounce."

Genius is capable of wonderful things to be sure, and no man can fix its limits. But the most ingenious machines, if they operate at all, must move in accordance with natural laws. The phenomenon which astonishes our editorial friend is that of a 4½ ounce ball going down hill and at the same time drawing up the hill a weight of 56 ounces. This apparent contradiction has bothered his mind out of its common sense.

The Berks County self-motor is nothing but a piece of mechanical legerdemain, deriving its motion from a concealed source, probably a clock work or an electro-magnet. Such "perpetual motions" are very old.

An engraving of a machine answering somewhat to the description of the "Berks," was published and explained some years ago in the Scientific American.

Trial Trip of the First Locomotive.

Major Horatio Allen, the engineer of the New York and Erie Railroad, gives the following account of the first trip made by a locomotive on this continent:

"When was it? Who was it? And who awakened its energies and directed its movements? It was in the year 1828, on the banks of the Lackawaxen, at the commencement of the railroads connecting the canal of the Delaware and Hudson Canal Company with their coal mines—and he who addresses you was the only person on that locomotive. The circumstances which led to my being alone on the road were these: The road had been built in the summer; the structure was of hemlock timber, and rails of large dimensions notched on caps placed far apart. The timber had cracked and warped from exposure to the sun. After about three hundred feet of straight line, the road crossed the Lackawaxen creek on trestle work about thirty feet high, with a curve of three hundred and fifty-five to four hundred feet radius. The impression was very general that the iron monster would either break down the road, or it would leave the track at the curve and plunge into the creek.

"My reply to such apprehensions was that it was too late to consider the probability of such occurrences; there was no other course than to have a trial made of the strange animal which had been brought here at great expense; but that it was not necessary that more than one should be involved in its fate; that I would take the first ride alone, and the time would come when I should look back to the incident with great interest.

"As I placed my hand on the throttle-valve handle, I was undecided whether I would move slowly or with a fair degree of speed; but believing that the road would prove safe, and preferring, if we did go down, to go handsomely, and without any evidence of timidity, I started with considerable velocity, passed the curve over the creek safely, and was soon out of hearing of the vast assemblage. At the end of two or three miles I reversed the valve the valve and returned without accident, having thus made the first railroad trip by locomotive, on the Western hemisphere."

Conduction of Air and Hydrogen.

Prof. Tyndall, in his lecture on "Vibratory Motion" at the Royal Institution, illustrated the very low conducting power of hydrogen for sound by a novel experiment. A bell struck by clockwork was placed under the receiver of an air pump, and the air exhausted as perfectly as possible. By applying the ear close to the glass a faint sound could still be heard. The exhausted receiver was then filled with hydrogen, when the bell was again heard to sound, but faintly. On pumping out the hydrogen all trace of sound ceased, even when the ear was placed close to the receiver. Hydrogen being about fifteen times lighter than air, it might be supposed that its low conducting power arose from its tenuity. But such is not the case; the conducting power of air, rarefied fifteen fold, and therefore of the same density, exceeds that of hydrogen in a marked degree.

It is stated that timber rendered fire proof by saturation with silicates is extensively used in Germany for flooring planks, doors, and staircases.

THE NEW TEMPLE EMANUEL.

The above is the name of the new Jewish synagogue recently dedicated situated on Fifth avenue and Forty-third street, New York city. Few buildings ever erected in this country, have attracted more attention, or are more entitled to admiration than this edifice. As a specimen of Moorish architecture, slightly modified to adapt the structure to its destined use, it affords a good study to professional architects and to all lovers of art. It occupies a lot one hundred and four feet on Fifth avenue, and one hundred and eighty-four feet on Forty-third street. It consists of a nave thirty-four feet wide, one hundred and sixty feet long, and seventy-two feet high, with transepts of about ninety feet in length, attached to which are aisles about twenty feet wide, containing the galleries. In front, on either side of the nave, rise two towers detached above the aisle walls, but connected with the nave by two bridges on a line with its ceiling and with the choir gallery, as well as by open balconies running all around the front. These towers are to be about one hundred and seventy feet high, and are to terminate in stone cupolas, the surfaces of which are to be covered with relief ornaments. The building is built of sandstone, out of the New Jersey, Cleveland, and New Brunswick quarries—each of these being used and a ranged with reference to its color. The entire cost of the structure and ground will amount to nearly a million dollars. The architects elected by the building committee were Mr. Leopold Eidlitz and Mr. Henry Fenerbach.

The *Evening Post* gives a graphic description of the new temple and designates it as a "poem in stone:"

"All admirers of fine architecture will first be impressed with the façade. Its fine proportions, varied color, and rich ornamentation are elements of beauty worthy of close study. The openings of the nave—the five entrance doors, the rose window and the transverse gallery near the apex—together with those of the tower crowned with open octagonal domes, are so many distinct forms hapily grouped and tastefully treated. The ornamentation throughout is honest, appropriate, and rich. Foliated capitals, delicately sculptured, and clustered columns attached to the doors and windows, fretted spandrils and light pinnacles, rising like minarets from the buttresses of nave and transepts, supply imaginative points of great value in the matter of expression. The bright cream-colored pinnacles relieving against a blue sky and on the brown rubble, sparkling like so many jewels in their setting, animate the entire front and forestall anything like monotony of outline. Various intaglio designs, consisting of intricate mazes of lines peculiar to the Moorish system of decoration, fascinate the eye and enliven surfaces that would otherwise appear sombre. This fine combination of ample forms and ornamental devices, each in appropriate relationship for use and beauty, secures to this building an elegant and majestic air, which more ostentatious structures of greater magnitude fail to convey. The secret of this effect does not lie in size or in richness of decoration, but in proportion, a quality of all others in architectural art the subtlest and most rarely encountered.

USE OF COLOR.

"Attractive as the exterior is, the interior far surpasses it. On entering the building we seem transported to another sphere. Here we enter on the realm of color; forms seem to have vanished or to resolve themselves into radiant splendor. Color as an architectural element appears to reign supreme; we have that which the Orientals, the acknowledged masters of this element of art, most delighted in. The problem they have solved through the skillful handling of ornament, and a consequent distribution of color, is the production of general effects not only pleasing in themselves, but also harmonizing with the constructive masses. The Jews in their Bible, and the Mohammedans in their Koran, prohibited from depicting animated forms, have been obliged to make the most of color on its own merits; color, consequently, is their principal decorative medium. Yellow or gold, blue, red, black, and white are their vehicles of art expression. All muddy compounds of hybrid tints, miscalled color in many modern pictures, are completely ignored. The only figures they employ are delicate arabasques and patterns arranged in a capricious but still regular manner, and which, adapted to the eye in conformity with its sensuous aptitude challenge no criticism on the score of their non-resemblance to known natural objects. Gorgeous hues, therefore, in true complementary union, cover the spacious walls of this edifice; the eye wanders over them attentive to their innumerable harmonies as the ear listens to the infinite harmonies of musical sounds. Draped arches, festooned with divers tints, support blue panels decked with golden stars, while the stained glass windows, more like luminous interstices than anything else, pour in a flood of prismatic brilliancy to blend all together in soft and radiant light. The obscurities of the triforium, the sanctuary, the organ-loft, and other spaces, lend an air of mystery to the general tone, which is again enhanced by the dark reflections of the richly carved wood work. The general effect is one of subdued richness, an effect in harmony with a spirit of adoration, and with that instinct which leads man to exalt worship by art.

"The use of color in this building will attract all eyes to it, and make it a model for imitation far and wide. Mr. Eidlitz has used color elsewhere, and notably in St. George's Church, but nowhere on the same grand and effective scale as here. Decorative motives generally consist of meaningless imitations of Renaissance ornaments, mouldings, panels and tracery bolstered up with artificial shadows, expressing no sentiment and symbolizing no truth. Color, as here employed, conforms to natural law, and is therefore a truth in itself. None of its combinations suggests the intellectual perversity associated with Renaissance symbols so conventionally applied to public and private edifices everywhere."

VENTILATION.

The *Journal of the Franklin Institute*, contains the first, or a part of the first of a second course of lectures on ventilation, delivered by Lewis W. Leeds, before the Franklin Institute during the winter of 1867-'68. There seems to be such an itching for scientific laurels at the present time, that the most common subjects, upon which all that is pertinent can be said plainly and briefly, are made the vehicles of professional display *ad nauseam*.

The subject of ventilation is an important one, and perhaps is not appreciated as it should be, or sufficiently provided for in either public or private edifices. Grant all that; but does it follow, that in order to cure the evil, long harangues upon the constitution of air, the physiology of respiration, the anatomy of the lungs, and the circulatory system, the diffusion of gases, and all the technical information in the remotest degree connected with the subject, should be aired in trying to convince people that unless they breath pure air their health will suffer? The first installment of these lectures treats of all the above-mentioned subjects, and more too. How much is to follow before the real gist of the subject shall be reached, we are unable to say. Perhaps a discussion of the respiratory apparatus of fishes and reptiles, with some accounts of toads which have been imbedded in rocks for nobody knows how many centuries, without breathing, and have emerged from their rocky prisons, "fresh as when in their pristine youth, etc," and hopped away without even thanking their deliverers. This might be made applicable to the subject of ventilation, as thus: The toad does not breath in the same way as man inhales the ambient air, consequently what is fun to them, would be death to you, my hearers. Moreover, all the stories of living toads, imbedded in rocks and trees, are humbugs—except the trees were hollow and the rocks had holes in them—from which we conclude that man could not breath without air, or live without breathing. *Quod erat demonstrandum.*

How to get the pure air is the question; a purely mechanical one. Hot air rises—cold air falls. The impure gases do the same thing; therefore it is only necessary to provide for the escape of foul gases at the bottom of a room, provided it is heated with warm air, or at the top, if heated by radiation; the pure air being admitted in the latter case through openings protected so that strong currents shall not be formed, and the exchange of air being fully provided for by passing the vitiated gases through heated flues, or drawing them off by fans or other apparatus.

There is the whole thing in a nutshell and all the scientific discussion of things upon the earth or under the earth can't make it more so; so the SCIENTIFIC AMERICAN believes and we believe its practical readers will concur.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office.

FOR THE WEEK ENDING SEPTEMBER 15, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

82,058.—MORTISING CHISEL.—Otis Adams and James Hatch, San Francisco, Cal.

We claim making the lips beveled from the edge to the main part of the chisel, and with the ends beveled and inclined, as herein set forth.

82,059.—LAMP BURNER.—Thomas Adams, Hudson City, N. J., assignor to himself, J. L. Romer, and H. T. McCoun, Brooklyn, N. Y.

I claim, 1st, The flattened, cone shaped wick tube, A, provided with a triangular opening, f, for admission of air in front, as it were, of the single wick, to establish a current through the center of the flame, and constructed so that in the passage of the single flat wick through it in a straight line, or thereabouts, from below, said wick is made to assume an annular form at its exit from said tube, substantially as specified.

2d, The arrangement of the wick lifter or operating device, E, relatively to the straight or entering portion, e, of the tube A, constructed as described, and for operation in connection with the latter to turn and convert the wick from a flat or straight into a round or annular form, essentially as herein set forth.

3d, The base portion of the burner, of globular or enlarged character, as described, and divided, as at b (forming a cap, D), between the collar screw of the lamp and draft opening or openings to the flame, as and for the purpose herein set forth.

82,060.—CULTIVATOR.—A. H. Allison, Charlottesville, Ind.

I claim, 1st, The yoke, C, secured to the under side of the tongue, and provided with the adjusting blocks, g g, in combination with the beams, G G, uprights, f f, provided with adjusting holes, double tree, e, arms, c' c', and braces, connecting the ends of the yoke with the main frame, all constructed, arranged, and operated in the manner and for the purpose set forth.

2d, The beams, G G, hinged to the adjusting blocks, g g, and provided with the shanks, I I, and braces, h h, in combination with the bails, J J, and foot pieces, Z Z, all constructed, arranged, and operated as set forth.

82,061.—SCHOOL DESK.—Herbert L. Andrews, Chicago, Ill.

I claim, 1st, The standard, composed of two parts, A B, one provided with the projection, g, and axle, i, and the other with the flange, a, in combination with the arm, C, the standards being secured by the screws and nuts, all substantially as specified.

2d, The combination and arrangement of the recess, b, when filled with rubber, or other elastic material, standard, B, and projecting heel, h, of the arm C, substantially as and for the purposes specified.

82,062.—BLACKBOARD.—Herbert L. Andrews, Chicago, Ill.

I claim the blackboard, A, when provided with the groove, b, arms, c, pins or hooks, c, and supported, constructed, and operating substantially as specified.

82,063.—LEATHER STRETCHING MACHINE.—W. R. Andrews, and Robert Dingwell, Newark, N. J.

We claim, 1st, The movable beam, B, in combination with the cross slat, C, when constructed and operated substantially as and for the purpose set forth.

2d, Operating the movable beam, B, by means of the ratchet bars, E E, and screws, D D, when constructed and arranged as specified, and for the purpose set forth.

82,064.—STOCK PUMP.—W. T. Armstrong, Freeland, Ill.

I claim the box pump, E, constructed as described, in combination with the stationary pipe, F, rod, D, and the compound hinged platform, B C, all constructed and arranged to operate substantially as shown and described.

82,065.—MOLDING PIPE.—John Aston, Pittsburg, assignor to William Smith, Allegheny City, Pa.

I claim, 1st, The combined arrangement of the flask, G, and hinged door G6, substantially as described.

2d, The pit, A, furnaces, B, with their flues, C, and outlets, Cc, ramming up stools, D, stoppers, E, nozzle, F, and sliding thumbs, Ff, the bars, K, and slide plates, L, when combined and arranged substantially as herein described and for the purpose set forth.

3d, Drying pipe molds by means of passing currents of heated air or gases through them, without removing them from the pit in which the operations of molding and casting are carried on, substantially as described.

82,066.—JOURNAL BOX.—John E. Atwood, Mansfield, Conn., assignor to himself, A. Sprague, and W. Sprague, Providence, R. I.

I claim the annular rios or collars, B*, near each end of the journal, in combination with the caps or shields, D, and the chambers, C*, provided in the journal box, all arranged substantially as herein set forth, for the purpose specified.

82,067.—SHINGLE MACHINE.—J. E. Austin, Oswego, N. Y.

I claim, 1st, The method of operating the tilting tables, F F, namely, the projecting arms, f, obliquely slotted slide bars, H h, the hooking connecting rods, I i, and crank wheels, J, having adjustable wrists or crank pins, all arranged and operating as herein shown and described, and for the purpose set forth.

2d, In connection with the tables, F, the laterally adjustable plate and socket block, N I M, and vertically adjustable fulcrum block, K L, constructed and operating as herein shown, and for the purpose described.

3d, The bolt cutters, C C, having a horizontal movement on frame, D, and provided with wedges, s s, for acting on inclined surfaces of said frame, D, in such manner that all sides of the bolt holders are lifted alike, in connection with tappet lever, R, and link, P, or other suitable device for obtaining the sliding movement of bolt holders on frame, D, as and for the purpose described.

82,068.—WAGON AXLE.—C. D. Bachelder, Camden, Me.

I claim, 1st, The combination, with an axle provided with an oil recess, b, of the cap, g, arranged oil tight therein, and provided with a slot for the wick, substantially as and for the purpose described.

2d, The recess, b, provided with the dividing rib, c, having a recess, d, for the wick, communicating with the recess, b, by the holes, e, substantially as and for the purpose set forth.

82,069.—WAGON JACK.—E. R. Baldwin, Southfield, Mass.

I claim the combination, with the bracket, B, and stand, A, of the friction rollers a and b, when applied and arranged as and for the purpose set forth.

82,070.—KNOB LATCH.—T. C. Ball, Bellows Falls, Vt.

I claim the combination of the lock ring, h, slots, c, and projections, k k, with and between the plates or escutcheon, b, and its projections, e and e', and the ring, g, with its slot, i, all operating together as and for the purpose set forth.

82,071.—ENAMEL FOR WINDOW-SHADES.—Edward C. Bancroft, Henry M. Bancroft, and Ed. H. Bancroft, Syracuse, N. Y.

We claim the employment of the within compound in the manufacture of cloth window shades, for the purpose described, substantially as set forth.

82,072.—ELASTIC DRAFT ATTACHMENT FOR SINGLE AND DOUBLE HARNESSES.—John Berron, Cincinnati, Ohio.

I claim the combination and arrangement of the India-rubber draft attachment, B, adjustable check strap, rods, or case, C, and coupling, G, substantially as and for the purpose herein specified.

82,073.—VISE.—Thomas L. Baylies and Edwin Crawley, Richmond, Ind.

We claim, 1st, The combination of the devices operating automatically, by which the action is changed from the adjusting to the compressing screw or screws, by a continuous turning of lever, a, in one direction, and the action of the screws is reversed by a continuous turning of said lever in the opposite direction, substantially as set forth.

2d, The combination of the pins, c and c', and slots, b and b', with the sleeve, G, and screws, F and E, substantially in the manner described and for the purpose set forth.

3d, The pawl, J, and trigger, H, in combination with the screw, E, adjusting screw, f, and sleeve, G, the latter being provided with a ratchet, as specified, and all operating substantially as described and for the purpose set forth.

82,074.—PLANE.—Valentin Bitsch, St. Louis, Mo.

I claim the combination of the bit, a, having its lower cutting edges to form a re-entering angle, with the open shank bit, a', having its lower cutting edges arranged with beveled corners, acting with the plane stock, A, to form blind slats, whose narrow edges are chamfered, substantially as set forth.

82,075.—FARM GATE.—Charles S. Bonney, Penn Yan, N. Y.

I claim the hinges, D E, when made and applied as specified, and used in combination with the gate, C, substantially as and for the purpose set forth.

82,076.—REFRIGERATOR.—Wilson Bray, Stockton, N. J.

I claim the forming or producing of a current of air within the provision chamber of a refrigerator, by means of a rotary fan or other mechanical device, so arranged as to impel or force the air through an ice box or water vessel surrounded by a freezing mixture, and also through a vessel containing charcoal or other absorbent of moisture and noxious gases, substantially as shown and described.

82,077.—MACHINE FOR FORMING EAVES-TROUGHS.—John Brett, Memphis, Mich.

I claim the eaves trough former constructed as herein described, of the grooved bed plate, A, crimping clamp, F, hinged thereto, with its hinged continuation, H I, and slotted roller, D, all arranged and constructed as herein shown and described.

82,078.—SAW SHARPENING DEVICE.—P. M. Bristol, Ludington, Mich.

I claim the swaging apparatus consisting of shaft C, wheel, D, and rest, E arranged and combined substantially as described.

82,079.—MANUFACTURE OF ARTIFICIAL FUEL.—George H. Bronson, New York city.

I claim the process of making artificial fuel in which pitch or other similar material is used to produce the agglomeration of the particles of the substance or substances which constitute the basis of the fuel, by first heating the coal or other substance, and, while it is heated, introducing among it the pitch or other similar material in a powdered state, substantially as herein described.

82,080.—APPARATUS FOR DOMESTIC MANUFACTURE OF GAS.—John W. Brown, Wooster, Ohio.

I claim, 1st, The retort, D, in combination with a gas apparatus adapted to domestic use, and as described, constructed substantially as set forth.

2d, The arrangement whereby the apparatus is made self-regulating, by the pressure of the gas in the gas holder, substantially as shown and described.

3d, Using the surplus gas as fuel, either under the retort for generating gas, or for other purposes, by the automatic arrangement, substantially as described.

4th, In combination with a gas apparatus, the washer and tar receptacle, G, and purifier, K when the same are constructed and arranged substantially as described.

5th, The rake, I, in the retort, substantially as and for the purpose set forth.

82,081.—CHAIR SEAT.—E. L. Buckingham, Jefferson, Wis.

I claim the strips, b, composing the chair bottom, secured in the rails, A, by being passed over and under said rails, the ends being inserted in oblique slots, a, and there retained by the strip, C, applied to the outer edge of the rails, A, all substantially as herein shown and described.

82,082.—CARRIAGE SPRING.—Azro Buzzell, West Fairlee, Vt.

I claim my improved arrangement of the three springs A B C, as described, without any connection extending from or about from the middle of one spring, B, to or about to that of the spring, C, the whole being as shown in the drawings.

82,083.—LUBRICATING MATERIAL.—Calvin Carpenter, Jr., Astoria, N. Y., assignor to H. H. Wolcott, New York city.

I claim a lubricating material prepared from crude petroleum, in the manner above set forth.

82,084.—ANGULAR SHAFT COUPLING.—John M. Case, Worthington, Ohio.

I claim, 1st, Forming the bars, upon which the segmental cogs, E, are cast solid, substantially as herein shown and described and for the purpose set forth.

2d, Forming rims or flanges upon the sides of the segmental cogs, E, for the purpose of preventing their lateral movement, and relieving the side pressure upon the connecting bars, F, as herein shown and described.

82,085.—WRENCH.—Luke Chapman, Collinsville, Conn.

I claim the combination with the jaw, A, provided with the recess, B, and annular groove, C, of the nut, D, and the spring ring, E, substantially as and for the purpose set forth.

82,086.—CAR WHEEL AND FROG.—W. H. Childe, Gainesville, Ala.

I claim uniting railroads of different gages by means of a frog applied at the junction of two or more tracks, and constructed as described, and by railroad wheels constructed with two or more independent treads, the said frog and wheels being employed together, but the former also permitting wheels with a single tread to pass over it, all substantially as described.

82,087.—MEASURING FUNNEL.—Charles Chinnock, Brooklyn, N. Y.

I claim the arrangement within the funnel of the stem, B, carrying the valve, C, at its lower end, whereby the weight of the funnel closes the valve when the latter is suspended by the stem for filling, substantially as herein set forth.

82,088.—FEED BAG.—Charles Chinnock, Brooklyn, N. Y., assignor to J. Little Hyde, New York city.

I claim the combination of the endless cord, c, and pulleys or slides, b with the feed bag, A, all arranged and operating essentially as set forth.

82,089.—CULTIVATOR.—Joseph H. Clifton, Newcastle, Pa.

I claim, 1st, The board, A, provided with the knives, s, etc., and teeth, b, as and for the purpose set forth.

2d, The board, A, in combination with the bar, c, and teeth, c', as and for the purpose set forth.

82,090.—SHUTTLE.—Nathan Clough, Lowell, Mass., and James Baldwin, Manchester, N. H.

We claim a shuttle having its tip-shank riveted to the wooden plug, and the plug secured in the shuttle, as herein described.

82,091.—BUCKLE.—James Cory, Wayne, Mich.

I claim the arrangement of the tongue, C, and cross bar, B, in connection with the bale, A, in such a manner that each tongue shall operate on its bail without any intermediate bar, substantially as and for the purposes set forth.

82,092.—SEED COVERER.—E. D. Cramer, Hackettstown, N.J.

I claim a pointed seed coverer, consisting of a triangular frame, A B, and of the up and down adjustable plates, D D, all made and operating substantially as herein shown and described.

82,093.—FORGING APPARATUS.—David Davies, Crumlin, England.

I claim, 1st, The steam cylinder and piston, connected with the hammer arm, so as to operate the same, in combination with the horizontal cylinder, arranged so that it can be turned, and in which the steam cylinder is mounted, substantially as described, so that the direction of the blows, relatively to the face of the anvil, can be changed.

2d, The steam cylinder and piston, connected with the hammer arm, so as to operate the same, and mounted in the horizontal cylinder, arranged so that it can be turned, to change the direction of the blows, relatively to the face of the anvil, substantially as described, in combination with the hydraulic ram, for raising and lowering the same, to adapt it to articles of various thicknesses or hight, substantially as described.

3d, Connecting the horizontal cylinder with its base, so that it can be turned in a horizontal plane, in combination with the steam cylinder and piston connected with the hammer, substantially as and for the purpose described.

82,094.—MOLDING BELL.—W. H. Davis, Brooklyn, N. Y.

I claim, 1st, The arrangement on the outer casing, B, of a downwardly projecting lip or rim, b, corresponding in size and position to the upwardly projecting rim or lip, a, on the inner casing, A, substantially as and for the purpose described.

2d, The arrangement of a guide for the sweep, D or D', on the rim of each casing, in addition to the central guide pin, d, substantially as and for the purpose set forth.

3d, The arrangement of two bearing points on the guide, F, substantially as and for the purpose set forth.

4th, The additional guide, G, catching over a rim, k, on the casing, in combination with the guide, F, substantially as and for the purpose described.

5th, The shank of the jaw, E, fitting into a socket in the guide, F, and allowing said jaw to accommodate itself to the position of the sweep, substantially as described.

82,095.—VISE.—Fernando J. Dibble, Chicago, Ill.

I claim, 1st, The combination and arrangement of the jaws, E D, the standard, C, and socket, B, provided with a set screw or its equivalent, the whole operating in the manner and for the purposes set forth.

2d, The combination of the jaws, E D, slide, H, screw, F, standard, C, and socket, B, arranged and operating in the manner and for the purposes described.

82,096.—BORING AND MORTISING MACHINE.—J. Jacob Earley, Fairfield, Ohio.

I claim, 1st, The adjustable chisels, I I, springs, N, cams, O, and wheel, G, when arranged and operated, in combination with the auger, H, for the purpose specified.

2d, The circular stays, L, adjustable radial arms, M, for expanding and contracting the shanks of the chisels, in the manner set forth.

82,097.—SAFETY ATTACHMENT TO WATCH.—Julius Elson (assignor to Florentine A. Jones), Boston, Mass.

I claim, 1st, The spring, D, provided with a stud or projection, d, one or more, in combination with the perforated barrel, as and for the purpose specified.

2d, The spring, D, in combination with the main spring, for the purpose of equalizing the tension of the latter, as set forth.

3d, The stud or projection, d, in combination with the barrel or main spring, when used and operating substantially as and for the purposes set forth.

82,098.—CHIMNEY TOP.—Henry English, Wilmington, Del.

I claim the construction of chimney tops, with one or more apertures at the base and upper portion, constructed and arranged as hereinbefore described for the purpose set forth.

82,099.—CHAMBER COMMODE.—Enoch S. Farson, Philadelphia Pa. Antedated September 1, 1868.

I claim the spring catch bar, E, in combination with the cover, D, pot, C, and adjusting handle, F, the said spring catch bar and handle being constructed and arranged to operate together substantially as and for the purpose described.

82,100.—MACHINE FOR STUFFING HORSE COLLARS.—William Fauntleroy, New Harmony, Ind.

I claim, 1st, The combination of the collar board, B, pulley, E, collar, I, and mandrel, K, substantially as and for the purpose described.

2d, The combination with the same, of the belt, F, and treadle, G, substantially as and for the purpose described.

82,101.—BEEHIVE.—Orrin Field, Independence, Iowa.

I claim the combination with the central fixed comb frame, B, of the detachable hinged comb frames, C, all arranged substantially as herein shown and described, for the purpose specified.

82,102.—PAVEMENT.—Richard Foley (assignor to himself and Edwin Ferguson), New York city.

I claim the combination, in a pavement, of the foundation boxes, a, filled with concrete, with the surface blocks, b, and strips, c, being laid in alternation, substantially as and for the purpose described.

82,103.—DEVICE FOR PRESSING, PACKING, AND WEIGHING WOOL.—A. W. Fox, Columbiaville, Mich.

I claim the weighing device, consisting of the circular plate, l, rod, p, hinged bar, j, tube, m, spring, l, and lever, L, in combination with the hinged parts, B B C C, and fixed part, D, of the packer, as herein described, for the purpose specified.

82,104.—PERMUTATION LOCK.—Cicero R. C. French, Berkley, Mass.

I claim, 1st, The combination, with a series of tumblers and adjustable rings, of an indicating wheel, O, a click, P, and sliding plate, C, whereby the bolt being set at half lock, the required combination may be formed, by turning the tumblers alternately in opposite directions, substantially as set forth.

2d, The curved recesses in the bolt, B, in combination with the sliding plate, C, when operating as and for the purpose specified.

3d, The click or bolt, P, provided with the projection, i, in combination with the bolt, B, as set forth.

82,105.—LIQUID METER.—Charles A. Geissenhainer, and George W. Geissenhainer, Pittsburg, Pa.

We claim the arrangement, in the air tight glass chamber, A, constructed as herein described, of the straight bucket wheel, B, water chamber, C, pipes, D E, cog wheels, B, and indicating devices, g, all constructed as and for the purposes set forth.

82,106.—MANUFACTURE OF BEET SUGAR.—Theodore Gennert, New York city.

I claim, 1st, Treating beet sugar with cane sirup or cane molasses, substantially as and for the purpose described.

2d, Treating beet sugar with cane sirup or cane molasses, under the application of heat, substantially as and for the purpose set forth.

3d, Exposing the beet sugar to the action of water or steam, after the same has been treated with cane sirup and molasses, substantially as and for the purpose described.

82,107.—MILL PICK.—H. H. Gillett, Warsaw, Mo.

I claim a mill pick handle, constructed as described, and provided with glass, enabling the operator to see his work, as well as shielding him from any particles of rock flying about, as herein set forth.

82,108.—CUPBOARD CATCH.—P. D. F. Goewey, Albany, N. Y.

I claim the latch, composed of the plate, A, the locking tumbler, D, in combination with and operated by the doubly-moving knob, C, all constructed substantially as herein shown and described, and for the purposes specified.

82,109.—ROCK-DRILLING MACHINE.—Ernst W. Gram, Negaunee, Mich., assignor to himself, Peter Berg, and A. P. Swineford.

I claim the combination of the stationary frame, A B, oscillating frame, C, trunnions, D, shaft, E, pinions, F G H, shaft, I, lifters, J, rod, K, wiper-lifter, L, spring, N, drill, O, cam, P, plate wheel, Q, spring R, and shoulder, S, all constructed and arranged substantially as herein described.

81,110.—LUBRICATING PULLEY.—James H. Gray, Boston, Mass. Antedated September 8, 1868.

I claim an oiling device for loose pulleys, when constructed, applied, and arranged to operate substantially as and for the purpose described.

82,111.—LIFTING JACK.—William Green, Holly, Mich. Antedated September 7, 1868.

I claim, 1st, The movable pedestal, B, when used in combination with a "lifting jack," the parts being constructed and arranged as and for the purpose specified.

2d, The arrangement of the springs, m m and j, with the lever, C, catch dogs, f f and h, the several parts being used as and for the purposes herein set forth.

82,112.—GATE.—William W. Green, Jr., Janesville, Wis.

I claim, 1st, The combination of the yoke, h k i, and guard, g, so as to allow the gate to be removed, when required, and yet prevent it from being removed by unruly animals, substantially as described.

2d, The combination of the elongated rail and cap, b a, bonnet, d, spur, e, yoke, h k i, wedge, n, and hook, l', substantially as described.

82,113.—MACHINE FOR PLANING AND MOLDING.—J. P. Grosvenor, Lowell, Mass.

I claim, 1st, The combination of the swinging mandrel frame with the vertically-adjusted slide, E, and laterally adjustable slide, I, substantially as described for the purpose specified.

2d, The pattern, constructed as described, with a rebated outer edge, in combination with the perforated rigid or flexible rack, r, substantially as described for the purpose specified.

3d, The rigid or flexible rack, r, constructed as described, and adapted to be applied to a pattern to be used in cutting irregular forms, substantially as herein shown and described.

4th, The pattern, Q, provided with a rack, r, around its outer edge, to assist the process of feeding the wood to the cutter head.

5th, The feed wheel, R R', when constructed of the two parts, R R', so as to operate, in connection with a pattern having a rebated outer edge, in the manner described.

82,114.—CLOTHES PIN.—John Haigney and Frank M. Hedman, East Boston, Mass.

We claim the combination and arrangement of the brace, D, and the catch-spring, F, with the two levers, A B, connected together in manner and so as to operate substantially as described.

Also, the arrangement and combination of the auxiliary spring, E, with the brace, D, the catch spring, F, and the two levers, A B, arranged and combined substantially as explained.

82,115.—WINDOW SCREEN.—Frank Hatch, La Crosse, Wis.

I claim the combination of the two sections or frames, A B, with a spring, d, so arranged that the spring will operate to force said sections outward against the window casing, and retain the screen in any desired position, substantially as and for the purpose described.

82,116.—BRICK MACHINE.—Daniel Hess, Blandville, Ky.

I claim, 1st, The arrangement of a centrally-poised beam, B, with its weighted box, A, oscillated by the arms, J, and connecting rod, K, in combination with the plungers, P, substantially in the manner and for the purpose specified.

2d, In combination with my oscillating box, A B, the plungers, P, with their enlarged base, p p, and slots, 1 2 3 etc., when operated substantially in the manner set forth.

3d, The arrangement of the press bed, G, and table, E, in combination with the revolving mold tables, F, between them, together with the molds, f, for pressing bricks edgewise, when arranged substantially as set forth.

4th, The arrangement of the table, E, with its hopper openings, 3, in combination with the revolving mold beds, F, and molds, 1 2 3, arranged in the manner and for the purpose specified.

82,117.—COUPLING.—John Heuermann, Davenport, Iowa.

I claim, 1st, The arrangement and combination of such coupling as is shown in drawings, and described in the specifications.

2d, The construction of slots extending about two-thirds of the distance from bottom to top or outer end in coupling case, as shown on drawings.

3d, The construction of openings in double cross sockets, for oval bolts.

82,118.—SCREW-CUTTING DIE.—Arnold Hoermann, New York city. Antedated September 4, 1868.

I claim, 1st, A screw-cutting die, having a recessed surface, so as to present two or more cutting threads in full sectional relief, as described and shown.

2d, The die, C, having a recessed surface, so as to present two or more cutting threads in full sectional relief, combined with the slot, C', set in advance of the center of the die, all as set forth.

3d, The guide, M, in combination with a die having portions of one or more threads entirely removed from the entering face thereof, the several parts being constructed and arranged substantially as and for the purpose herein set forth.

82,119.—FLOOR COVERING.—Wm. Howell, J. C. Finn, and C. A. Day, Philadelphia, Pa.

We claim a covering for floors, etc., consisting of layers of cloth, paper, and wood, combined as set forth.

82,120.—COMPOSITION FOR SIZING AND DRESSING WARPS.—Thomas Johnson, Tewksbury, assignor to himself and J. H. Hutchinson, Lawrence, Mass.

I claim the above described composition, as composed of the before-mentioned ingredients, combined by means of water and heat, in manner substantially as described.

82,121.—EXTRACTING TAN BARK.—T. W. Johnson, New York city.

I claim, 1st, The within described process of extracting tan bark by softening the bark in chips, passing it through rollers into the saturating tank, exposing it in said tank to the action of beaters, elevating and passing it through a series of leaches, where it is washed repeatedly until all the astringent properties contained therein are taken up by the wash, substantially as set forth.

2d, Passing a constantly fresh supply of crushed bark through the saturating tank, and exposing it therein to the action of beaters, substantially as and for the purpose described.

3d, Separating the disintegrated bark from the liquid absorbed by it while passing through the saturating tank, by the action of the perforated buckets on the elevator, and by that of the leach which receives the bark as the same is discharged from said elevator, the liquid absorbed by the disintegrated bark being drained off by the perforated elevator buckets, and by the perforated bottom of the receiving leach, and returned to the saturating tank, substantially as set forth.

82,122.—COMPOSITION FOR MAKING DESIGNS UPON FABRICS.—Mrs. R. L. Jones, Sacramento, Cal. Antedated May 6, 1868.

I claim the composition of rosin and soot perfumed as above described, and for the purpose set forth.

82,123.—HEMP BRAKE.—John Kaye, Louisville, Ky.

I claim the combination of the cranks and beaters, when constructed and operating substantially in the manner and for the purpose herein described.

82,124.—DEVICE FOR BLOCKING CHAINS.—Peter Kendrick, Trenton, N. J.

I claim the box, A, provided with the movable partition, C, and screws, P, in combination with the strips, a a', at the ends of the bottom, ax, of the box, for supporting the long links, D, at the ends of the box, substantially as and for the purpose specified.

82,125.—INVALID REST.—T. S. Kennard, Exeter, N. H.

I claim the combination of the brace, A, which supports the back of the rest, B, at different angles, and secured by the thumb screw in the socket, C, and at the lower end by the hinge, D, with the card teeth, E E, on the under side of the rest, to prevent its sliding or slipping on the bed when in use, in the manner described.

82,126.—OSCILLATING STEAM ENGINE.—R. J. King, Lancaster, Pa.

I claim, 1st, The arrangement of the connecting rod, A, with its slot, C, and regulating devices, D E and F, with the rock shaft, G, and eccentric, S, as herein described.

2d, The arrangement of the eccentric, S, with reference to the parts, A C D and F, and the shaft, T, as herein set forth.

3d, The arrangement of the angular pipes, M and R, with the steam chest, N and the trunnions, P, as herein set forth.

82,127.—ADJUSTABLE CARRIAGE POLE.—M. A. Koon, Catskill, N. Y.

I claim, 1st, Making the extension, B, through which the arms, C C', of the swinging braces, D D', pass, separate from the pole itself, substantially as herein shown and described.

2d, The arms, C C, constructed as described, and attached directly in the pole extension by means of a horizontal aperture fitted through, and a screw, a, fitted into the same, as set forth.

3d, Making the contiguous surfaces of the arms, C C', rough or toothed, as set forth, and forming indentations, b b, or their equivalents, on the outer face of one of them, substantially as and for the purpose herein shown and described.

82,128.—LIFTING MACHINE.—A. Kriebel, Hereford, Pa.

I claim the combination of the slotted perforated post, A, two pins, B, lever, C, and chain, D, with each other, said parts being constructed, arranged, and operating substantially as herein shown and described, and for the purpose set forth.

82,129.—ANILINE DYE.—J. Lambert, Jr., (assignor to himself and Charles Rumpff,) New York city.

I claim, 1st, The new product or coloring material above described, called by me saffranine red.

2d, The process employed by me for producing the said coloring material, saffranine red, substantially as above described.

82,130.—PLOW AND CULTIVATOR.—John Lane, Chicago, Ill.

I claim the improvement herein described in the manufacture of plows and cultivators, that is to say, the making of them of metal plates, having a central layer of soft iron or steel, with exterior layers of cast steel, substantially as and for the purposes described.

82,131.—CENTERING DEVICE.—E. E. Lazell (assignor to himself, T. H. Peters, and F. Keyser), Philadelphia, Pa.

I claim the arrangement, with the concave conical milling head, D, of the centering pin, E, projecting through the head, D, in the manner and for the purpose herein specified.

82,132.—BAG-HOLDING DEVICE AND TRUCK.—J. S. Lehman, Mount Joy, Pa.

I claim the holder, C, constructed as described, and having a short angle, W, with beveled sides, so as to fit into dovetailed slots in the jaws, B, all arranged and operated substantially as specified and shown.

82,133.—OUT-HAUL FOR BOOMS.—George W. Leighton, and C. O. Cole, Portland, Me.

We claim the combination and arrangement of the rack, b, and vessel's boom, dog, B, ring, f, and loop, e, or their equivalents, as and for the purposes set forth.

82,134.—PLAYING CARDS.—John J. Levy, New York city.

I claim as new articles of manufacture, playing cards provided with beveled edges, substantially as herein shown and described, and for the purpose set forth.

82,135.—DEVICE FOR CONDUCTING GRAIN TO THRESHING MACHINE.—A. W. Lockhart, Sacramento, Cal.

I claim the employment or use of a plurality of endless aprons, H K K, connected with a frame, F, and an adjustable upright pole, A, all arranged in such a manner, that the aprons may be adjusted at different degrees of inclination in order to feed grain from stacks or wagons to threshing machines, and the pole rendered capable of always being adjusted in a vertical position, even when placed on uneven or inclined ground, substantially as and for the purposes herein set forth.

82,136.—CHIMNEY SCRAPER.—Shubael K. Luce (assignor to himself and Charles O. Luce), Marion, Mass.

I claim a scraper, composed of the bars, I I I I, with slots, i i i i, the bars, H H H H, with bolts, h h h h h h h h, and the corner bolts, L L L L, connected by the expanding springs, J J J J J J J J, the collars, K K, on the shaft, F, the whole being constructed and operating in the manner and for the purpose herein described and set forth.

82,137.—COMBINED CORN PLANTER AND CULTIVATOR.—John S. Mason, Coal Run, Ohio.

I claim the plow beams, K K, attached to the frame, A, by joints, j, in connection with the standards, h, and covering plates, ix, crank shaft, L, to the cranks, k, of which the beams are connected by chains, and the lever, M, at one end of the shaft, L, substantially as and for the purpose specified.

82,138.—LIQUID METER.—Joshua Mason, Paterson, N. J.

I claim, 1st, The combination, with the measuring cylinder, A, and its reciprocating piston, B, of primary and secondary valves, K and P, when arranged for operation in relation to the measuring cylinder, substantially as shown and described.

2d, The primary and secondary valves, K and P, formed with disks or heads, j j' k k', and n n' r r', for operation within valve chambers, F F', in combination with ports and passages, f f', i i', inlet passages, x, branch, e, passage way, H, ports, s s', and passage, G, with its opening, d, essentially as specified.

3d, The arrangement of the ports or passages which control the ingress and egress of liquid through the secondary valve, and of the passages in connection therewith in such manner as that the flow of the liquid through the valve acts on the latter in the same direction as that to which it has been last shot, and so that said valve is kept shot or thrown in opposite or reverse positions by the pressure of the fluid on its opposite heads alternately, substantially as herein set forth.

4th, The primary valve, K, operated by the piston of the measuring cylinder, essentially as described, and having an open tubular stem in open communication with the latter, as and for the purpose specified.

82,139.—PRESS.—George Matthewman, Brooklyn, N. Y.

I claim operating the press through the instrumentality of two toggles arranged as represented, that is to say, the arm, I, operating the arm, F, through the link, H, presenting the several angular relations at the different periods, as specified, and the motion thus transmitted being conveyed to the press-rod, b, and its connections, through the medium of the arms, E, and links, D, forming a second toggle, all substantially as and for the purposes herein set forth.

82,140.—SULKY PLOW.—J. R. McConnell, Marengo, Iowa.

I claim, 1st, The construction and arrangement of the pivoted draft pole K, adjustable side bar, E, beam, A, and lever, L, as herein described for the purpose specified.

2d, The adjustable right angular bar, E, seed bar, I, adjustable bar, J, brace, G, and lever, L, in combination with the beam, A, pivoted draft pole, K, and plow, C, all arranged as described, for the purpose specified.

3d, The adjustable right angular bar, E, adapted to support the seat and bar, H I, the bar, J, brace, G, and pivoted draft pole, K, as herein described for the purpose specified.

82,141.—HARVESTER RAKE.—Leander J. McCormick, William R. Baker, and Lambert Erpelding (assignors to C. H. McCormick and Brother), Chicago, Ill.

We claim, 1st, The combination in a harvester, substantially as set forth, of a hinged finger beam, a narrow platform affixed to the finger beam, and a dropping platform hinged to the fixed one, with a series of steel ribs, and a rake revolving over the platform on a horizontal shaft, and mounted on a support secured on the shoe.

2d, The combination, substantially as set forth, with the tripping cam, of the vibrating arm, U, and oscillating dog, for the purposes set forth.

82,142.—HAMES FASTENER.—Robert R. McDonald, Syracuse, N. Y.

I claim the frame, A, the teeth, B B, the catches, C C, the thumb-screw, D, the spring, E, and tongue, when the parts are constructed, combined, and used in the manner as set forth and described.

82,143.—TENONING MACHINE.—William McKnight (assignor to himself, John H. Fulford, and Daniel W. McCurdy), Clearfield, Pa.

I claim the arrangement of the guide, C, rest plates, a, adjustable rest, b, and sliding rest, d, upon the bed, to operate in connection with a plane, as herein shown and described.

82,144.—TOBACCO DRESSING MACHINE.—Robert Meginnity and Joseph Dessenger, Detroit, Mich.

We claim 1st, The loosening of the fibers of fine cut tobacco by a blast of air passing through the same.

2d, The oscillating cylinder, F, provided with the rock shaft, D, the inclined longitudinal screens, O O, the perforated tweer plate, N, the openings S and P, the doors, Q, bumper springs, R, stirrup, T, and step, V, when arranged and operating in the manner described, and for the purposes set forth.

3d, The fan blower, B, driving shaft, D, pulley, C, crank, E, connecting rod, G, and rocker arm, H, the air-conducting pipe, J, oscillating tweer, K, trunnion, U, and blast pipes, M, when arranged and operating substantially as described, for the purpose specified.

4th, The combination and arrangement of the above-named parts with the frame, A, substantially as and for the purposes set forth.

82,145.—CARVING MACHINE.—George Merrill, Newburyport, Mass.

I claim, 1st, The combination, in a machine constructed substantially as described, of the laterally-swinging arms, D, and the vertically-sliding tool and guide holder, u, when said parts are arranged to operate substantially as and for the purpose set forth.

2d, The combination of the swinging frame and the sliding plate or frame, u, carrying the cutting tool and guide, arranged with sliding table, B, to operate in connection therewith, substantially as described.

3d, The combination of the adjustable frame, H, hinged bars, D, frame, T, having the pulley, I, mounted thereon, and the sliding plate or frame, u, when arranged to operate as set forth.

82,146.—STEAM GENERATOR.—T. H. Muller, New York city.

I claim, 1st, The construction of the diaphragms, G, extending in a longitudinal direction through the tubes, B, substantially as described.

2d, The construction of the flanges, b, at the ends of the diaphragms, G, substantially as set forth.

82,147.—CORSET.—William W. Netterfield, Rochester, N. Y.

I claim the arrangement of the stiffeners, h i k, springs, c c, diagonal shoulder braces, l l, straps, a a, back stiffeners, b b, hooks or buckles, m m, and side spring stiffeners, f f, all as herein described and for the purpose set forth.

82,148.—CORN HARVESTER.—Nelson Newman, Springfield, Ill.

I claim the yielding bars, H, applied to the machine as shown, or in an equivalent way, to operate in connection with the teeth or cutters, e, and fingers, c, substantially as and for the purpose set forth.

82,149.—ROTARY STEAM ENGINE.—Thomas A. Nizer, Hamilton, Ohio.

I claim, 1st, The arrangement of the cylinders, k k, piston, J J, steam pipes, L F, lever arrangement and cock, m, double abutments, E, and partition plate, h, with relation to each other and the inclined planes, C, as herein shown and described.

2d, The adjustable packing plate, a, adapted to conform to the curve, O, of the inclined planes, C, as herein shown and described.

82,150.—LAMP.—John E. Noyes, New Albany, Ind.

I claim, 1st, The lamp, B, provided with tube, C, hollow shaft, f, with opening, i, and screw regulator, g, substantially as and for the purposes set forth.

2d, The triangular, plate, formed into a wick tube, F, with the projecting edges of the wick, in the manner set forth, and used with the lamp, B, as constructed, as and for the purposes set forth.

82,151.—ILLUMINATING OIL.—John E. Noyes, New Albany, Ind.

I claim the within-described burning fluid, compounded and prepared substantially as set forth.

82,152.—HAY KNIFE.—James Offineer, Ashland, Ohio.

I claim the knives, A B C and D, attached to the iron strip, H, when arranged and combined as herein described, for the purpose set forth.

82,153.—SEED PLANTER.—R. F. Osgood, Rochester, N. Y.

I claim, 1st, So combining and arranging the feeding apparatus, consisting of hoppers, E, rollers, G, and drill teeth, H, with the shaft, I, that the lateral adjustment to change the width of the rows shall be effected by simply sliding in the straight continuous shaft, as herein set forth.

2d, Combining with the swinging gate, and with the seeding apparatus mounted thereon, the adjusting screws, k k, or equivalent, whereby the depth of cut of the drill teeth may be increased or lessened, as set forth.

3d, The combination of the gear bar, L, and the swinging gate, D, of the arm, q, so arranged that the gate is allowed a range of motion sufficient to adjust the depth of cut of the drill teeth, before the gear is raised to be disengaged, as herein set forth.

81,154.—PROCESS OF PREPARING SULPHATE OF BARYTES.—William M. Page and Emil B. Krausse, St. Louis, Mo.

We claim the process, substantially as described, for heating sulphate of baryta, and producing therefrom the refined product known to the trade as "sulphate of barytes."

82,155.—CORN PLANTER.—G. F. Partridge, Adrian, Mich.

I claim, 1st, The hopper, H, horizontal and perpendicular spout, I, slide, K, valve, L, lever, N, connecting rod, O, bell crank, P, arms, S, levers, T, all being operated by the projections, F, upon the sides of the wheel, D, when constructed and arranged substantially as herein set forth.

2d, The lever, W, rod, X, bars, Y, in connection with the bends, Z, pole, 3, hounds, 4, and rod, 5, when operating substantially as and for the purpose herein described.

3d, The combination and arrangement of the above named parts with wheels A and D, axle, B, frame, C, parallel bars, E, front bar, G, standard, 6, cultivator teeth, 7, scraper, 8, lugs, 9, when constructed, arranged, and operating substantially as and for the purposes herein specified.

82,156.—HARVESTER.—Everett G. Passmore, Jr., Philadelphia, Pa.

I claim, 1st, The combination, substantially as set forth, of the main frame, the driving wheel, the finger beam, arranged in the same vertical plane as the main axle, but on a lower level, the vertically-moving pivoted tongue, the adjusting crank, and the hand lever, J, whereby the guards may be tipped at the will of the operator.

2d, The combination, substantially as set forth, of the independently-hinged combined reel and rake arms, the double-tracked cam, and the vertically-adjustable guide arms, whereby the beaters are caused to descend into the standing grain in advance of the cutters, and to rise before reaching the cutters, as set forth.

3d, The combination, as set forth, of the rake arm, guide, and cam way, s, with the spring latch, u, which is lowered to lift the rake, and the latch, s2, which falls to guide it back to the track, whereby the gravel is always removed unless the rake is lifted by the latch.

4th, The combination, in a harvester, substantially as set forth, of a series of independently hinged rotating rake and reel arms with the double tracked cam-way and connecting guides, when so arranged that the rake descends upon the platform behind the cutters, to sweep off the gavel, while the beaters descend into the grain in advance of the cutters, and rise before reaching them, to lift fallen grain.

82,157.—PLOW.—Ezra Peck, Chicago, Ill.

I claim, 1st, A hollow sheet metal beam, when constructed with the flanges, E E, as set forth and for the purpose specified.

2d, Constructing a hollow plow beam by riveting or otherwise properly fastening together the two parts, A and K, or their equivalent, for the purpose specified.

3d, Constructing a hollow plow standard and beam, curved and bent in one continuous piece, directly from sheet metal, in the manner and for the purpose specified, as a new article of manufacture.

4th, The slotted concave support, in combination with the beam, A, and mold board, z, all arranged as set forth.

5th, Rounding or angling the inner bearing or face of the coulter standard, u, when used in connection with the clasp, j, in the manner and for the purpose specified.

6th, The beam, A, strip, K, flanges, E E, slotted support, o, and mold board, z, all constructed and arranged as set forth.

82,158.—SMOKE STACK.—Theodore P. Peck, Savannah, Ga.

I claim, 1st, The cone box, B, having perforated upper section, with bonneted outlets or port holes, c', substantially as herein described.

2d, The inverted truncated cone shaped sleve, F, arranged within the perforated upper section of the cone box, B, substantially as and for the purpose herein set forth.

3d, The combination of the cone box, B, and sleve, F, with each other and with the other parts of a smoke stack, substantially as herein specified.

82,159.—METALLIC SHUTTER.—Eliab Perkins, Fond du Lac, Wis.

I claim, 1st, A metal shutter, formed of two plates recessed and riveted together, in the manner substantially as described.

2d, A metallic shutter, constructed substantially as herein described, and provided with a water reservoir, substantially as set forth.

82,160.—FURNACE FOR MELTING STEEL, IRON, ETC.—Edward R. Playle, Great Bend, Pa.

I claim the furnace, A, when suspended on trunnions with power gear attached, for the purpose herein described.

82,161.—STOP-COCK.—Joshua Regester, Baltimore, Md.

I claim, 1st, The valve, F, constructed with a flange, i, and embraced by an elastic packing, b, which is applied between the collar and cap of the stop-cock, substantially as described.

2d, A right and left screw valve stem, D D', a valve, F, and the picking, b, combined and adapted to operate substantially as described.

82,162.—CORN-PLANTER.—James Selby, Peoria, Ill.

I claim, 1st, The combination, with the slide, C, of the roller, h, and arm or support, D when arranged to operate substantially as described

2d, The lever, L, having its lower end resting in a socket or rest connected to the seed slide, for the purpose of holding the slide down while operating it, as set forth.

3d, The seed-tube, B, provided with the vertical partition, I, and horizontal partition, f, with the holes, o, therein, substantially as described.

4th, The valve-rod, b', with the valve, n, attached thereto, said rod, b', being located in the seed tube, B, and operated by the slide, C, substantially as shown and described.

82,163.—HOWEL AND CROZE.—Jacob B. Siefried, Pittsburg, Pa.

I claim, 1st, In the case of a howel, or of a howel and croze, the opposite working faces, a a', made substantially as described, and either with or without the flat face, a'', for the purpose set forth.

2d, A howeling bit, c, made with two or more curved edges, x x', to correspond to the shape of the working edges, a a', of a howel-case, substantially as above described.

3d, The construction of a combined howel and croze, the cutting bits of the croze being placed at or a little forward of the centre of the working face of the howel, and the howeling bit just back of the centre, substantially as and for the purposes set forth.

4th, The frame, f, as a box or case for the crozing chisels, hung in the combined tool by a ball-and-socket or hinge joint, or other equivalent device, and operated substantially as and for the purposes above set forth.

82,164.—APPARATUS FOR IMPREGNATING CANE JUICE AND OTHER LIQUIDS WITH SULPHUROUS-ACID GAS.—Evan Skelly, Plaquemine, La.

I claim, 1st, The register, K and valve J, in connection with the wheel, O, and pendent valve, L, all arranged as shown, or in an equivalent way, to admit of the supply of gas to the cane juice being automatically regulated by the quantity of juice passing through the juice trough, substantially as set forth.

2d, The wheel, O, in the juice trough, M, in combination with the pendent partition plates, N N, and recesses, e e, all arranged as shown for the mixing of the gas with the cane juice, and the prevention of the escape of gas from the juice trough, substantially as shown and described.

3d, The wheel, F, provided with the draught nozzles, a, and submerged in the chamber, E, in combination with the pipes, B B' B'', and furnace A, all constructed and arranged as shown, for the purpose of drawing the gas from the chamber through the water in E, substantially as set forth.

82,165.—GANG PLOW.—Frederick P. Smith, Petaluma, Cal.

I claim, 1st, The arrangement of the devices and means herein recited for raising and lowering the frame and plows.

2d, The bars, with spaces on the end of the beam, and on the tongue, with the bolts and nuts for the adjustment of the land wheel axle, and the caster wheel's arm, as herein set forth.

82,166.—GANG PLOW.—F. P. Smith, Petaluma, Cal.

I claim the combination of the several means and devices herein set forth, for raising and lowering the plows.

82,167.—TWINE BOX.—H. Smith and J. Emery, Buffalo, N.Y.

We claim, 1st, The adjustable and removable knife, B, having a screw shank, C, and set screw, C', in combination with the twine box, A, substantially as described.

2d, The extended screw shank, C, and set screw, C', as a means of connecting and securing both the knife, B, and removable bottom, D, to the main body of the twine box, A, substantially as herein described.

82,168.—HAME.—Isaac B. Smith and Henry C. Burr, Springfield, Vt.

We claim, 1st, The combination of the post, A, double post, B, and blot, E, arranged and constructed substantially as and for the purpose described.

2d, In combination with the bolt, E, the washers, J and K, arranged upon it, substantially as set forth.

82,169.—COAL STOVE.—H. D. Snyder, Carbondale, Pa.

I claim a stove composed essentially of the wall A, formed of the system of doors, as above described, the grate, D, supported as described, the cylinders, C and G, the upright shaft, I, the centering plate, i, and the radiating box, J, all the said parts being constructed and put together as described.

82,170.—GRAIN DRYER.—Henry Spendelow and Rob't Henenage, Buffalo, N. Y.

We claim, 1st, The arrangement, in combination with the closed chambers, of the disk plates, k, and raised flanges, h, in the manner and for the purpose herein set forth.

2d, The combination, with the arms, l l, of the spreaders, p p p, arranged as described, and operating in the manner and for the purpose specified.

3d, The arrangement, in combination with the drying floors, C, and arms, l l, of the series of slots, m m, receding in position, so as to leave a closed surface in the succeeding floor below each slot, as herein set forth.

82,171.—GUIDE FOR SCROLL SAW.—G. W. Staats, Newcastle, Pa.

I claim, 1st, The guide, A a, substantially as described, in combination with a scroll saw and a pattern, all as and for the purpose set forth.

2d, The auxiliary guide plates, h h', links, i i, and suitable accessory plates, k j k, and screws, l, for giving the proper curvature to the plates, h h', all substantially as shown and described, in combination with the guide plate, A' a', and a scroll saw, all as set forth.

82,172.—JOINING AND FITTING HOOF HOOKS.—F. Stanley, Austin, Texas.

I claim the fitting of the hoof-hook or cleaner into the back of the ordinary horse brush, and the mechanism above described, by which it is confined in its sheath or thrown out at pleasure, or any similar arrangement answering the same purpose.

82,173.—COOKING-STOVE VENTILATOR.—C. Stoddard and A. Stoddard, Naples, N. Y.

We claim the sleeve, a, as arranged and combined with stovepipe, A, pipes, B and D, and metallic dish, C, substantially in the manner and for the purpose herein set forth.

82,174.—CHEESE PRESS.—J.D. Stratton and T. Wilson, Mackinaw, Ill., assignors to J. D. Stratton.

We claim a cheese press having attached thereto the cam, H, lever, H, rollers, E and G, and sliding beams, P, constructed and arranged substantially as specified.

82,175.—WASH BOARD.—H. B. Straut, Greenleaf, Minn.

I claim, in combination, the construction of the rubbing board, D, within frame, C, and the mode of attaching the same, thus constructed, to a common washing board, substantially as and for the purposes described.

82,176.—FIRE ESCAPE.—S. A. Swaim and C. C. Smitt, New York city.

We claim, 1st, A fire-escape ladder attached at the upper part of the window, inside the building, in combination with a box or receptacle for holding such ladder when folded, and a swinging bottom and latch, applied substantially as set forth, to cause the ladder to pass outside the building as it is unfolded for use, as specified.

2d, The tubular rungs for the ladder, formed with right-and-left-hand screws at their ends, in combination with the link, n, that connect with the ropes or chains, substantially as set forth.

82,177.—FRUIT GATHERER.—Geo. Tanner, Freetown, N. Y.

I claim, 1st, The combination of the rod, C, with its hook, E, and the rod, A, with its cross-head piece, to form an adjustable clamp for the uses and purposes set forth.

2d, In combination with the above, the saw, F, when arranged to operate as described.

82,178.—COTTON PRESS.—W. H. Tappey, W. C. Lumsden, and A. Steel, Petersburg, Va.

We claim the shaft, G, wheel, P, rack, B, wheel, H, pawls, e and d, double arms, Q, rod, k, lever, M, and roller, f, all arranged, constructed, and operated substantially as described, in combination with the follow block, C, and beam, A, of an upright press, as set forth.

82,179.—BIT STOCK.—J. W. Thompson and F. M. Thompson, Greenfield, Mass.

We claim a bit stock or tool holder, constructed and arranged so as to operate substantially as described.

82,180.—CULTIVATOR.—Thomas Thorley, Southfield, Mich.

I claim, 1st, The quadrant, I, provided with flanges, J, when attached, and operating substantially as and for the purposes herein described.

2d, The levers, K, the bolt and hand nut, L, and the plate, N, provided with the slot, N, when arranged and operating substantially as and for the purposes herein shown.

3d, The combination of the beam, A, the vertical standard, C, the teeth, D and H, the handles, E, and arms, F, the standards, G, the quadrant, I, the flanges, J, the levers, K, the bolt and hand nut, L, the slot, M, and plate, N, when constructed, arranged, and operating substantially as and for the purposes herein set forth, described, and shown.

82,181.—PAPER FASTENER.—William M. Tileston, N.Y. city.

I claim corrugating, fluting, or grooving the points and arms, for punching the holes as described.

82,182.—LUBRICATOR.—Richard H. Tradenick, Pittsburg, Pa.

I claim the oil cup, C, having the column, E, oil passage, G, ball, F, top, K, and set screw, L, when constructed and operating substantially as and for the purpose set forth.

82,183.—SEWING-MACHINE.—J. D. Vanduzer, Tyrone, N.Y.

I claim, 1st, The arrangement of the cam wheel, C, connection, D, lever, E, and pendulous frame, I, when constructed and operating substantially as and for the purpose set forth.

2d, The eccentric, D, bar, N, and pivoted lever, O, in combination, when constructed as described, and arranged to give motion to the cloth, substantially as herein set forth.

82,184.—CUT-OFF VALVE GEAR FOR STEAM ENGINE.—C. W. Wailey, New Orleans, La., assignor to the New Orleans Pneumatic Propelling Company.

I claim, 1st, The arrangement of the toggle joints, D D' D'' D''', with reference to the induction and eduction valves, when those parts are constructed substantially as herein described.

2d, The arrangement of the toggle joints, D D' D'' D''', with the bars, E and E', substantially as herein described.

81,185.—POST HOLE BORER.—Jacob M. Walter, and Samuel Shank, Springfield, Ohio.

We claim, 1st, The arrangement, within the frame, G J K, hinged, at L, to the main frame, of the jointed shaft, f f, bearing the auger, the arm, q, and beveled gear wheel, k, adapted to turn with and move longitudinally on said shaft, pinion, l, on crank shaft, H, windlass, I, cords, p, ratchet wheel, n, pawl, o, and crank, M, all constructed and arranged to operate in the manner and for the purpose herein set forth and shown.

2d, The hollow blocks, C, fixed to frame, A, and adapted to receive the head, b, of axle, a, on which the wheel, B, is held by means of nut, d, as herein shown and described, for the purpose specified.

82,186.—RAIL FENCE.—Eli G. Warner, Union Township, O.

I claim the construction of a fence, with a triangular frame, A B C, in which the rails are laid obliquely, in the manner and for the purpose as above stated.

82,187.—KITCHEN IMPLEMENT.—Charles S. Westland, and John B. Allen, Providence, R. I.

We claim a kitchen implement, constructed substantially as described, and for the purpose set forth.

82,188.—SHOE LACING.—Margeannah White, Providence, R.I.

I claim the eye A, in connection with its fastening, B and C, when constructed and applied to a shoe, substantially as set forth and for the purpose specified.

82,189.—ATTACHMENT FOR PLOW.—Charles E. Wilson, Palmyra, Me.

I claim the spring, B, adjustable roller head, D, and roller, C, as an attachment for a plow, all constructed and operating substantially in the manner and for the purposes shown and described.

82,190.—VALVE GEAR FOR STEAM ENGINE.—Furman R. Wilson, Philadelphia, Pa.

I claim, 1st, The arrangement of the adjustable cams, C' C', composed as described, with reference to the screw thread, b, on the piston rod, I', and the key, e, and key slots, d, substantially as herein shown and described, and for the purpose set forth.

2d, The lever, O O O, with its two short arms, having the rollers, h and l, arranged with reference to the valve rods, M M, and cams, T and S, upon the piston rod, I, substantially as herein described, and for the purpose set forth.

3d, The cams, S and T, being both arranged on one piston rod, in combination with the lever, O O O, substantially as described, and for the purpose forth.

82,191.—CULTIVATOR.—J. A. Woodward, S. S. Woodward, and Thomas Mason, Sandwich, Ill.

We claim, 1st, The reversable axle joints, H H, pivoted to the frame, A B, and arranged to balance the same, substantially as set forth.

2d, The combination of the above-described axle joints, with the frame, A B, and folding seat, L, as and for the purpose herein described.

3d, The handles, D D, pivoted to the standards, E E, and made adjustable to or from each other by means of the slotted plates, F F, and set screws, I I, as described and shown.

82,192.—PERMUTATION LOCK.—Linus Yale, Jr., Shelburne Falls Mass.

I claim, 1st, The method of adjusting the lock to and connecting it with the door by means of the steady pins and bearing screws, substantially as described, in combination with the fastening screws, or the equivalent fastening, as and for the purpose described.

2d, In combination with the lock bolt, two sets of rotating tumblers, and their appendages, each set operated by one spindle, which also acts upon the bolt and the racks connected with the fence of the tumblers, and capable of being thrown separately in and out of gear with the pinion on the lock bolt, substantially as and for the purpose specified.

3d, The rack, or its equivalent, to stop or liberate the lock bolt, when combined with the fence of the tumblers, by means of an interposed spring, or equivalent, substantially as and for the purpose specified.

4th, Combining the eccentric roller, which is acted upon by a wheel or equivalent on the spindle, with the fence of the tumblers by a vibrating lever, or equivalent therefor, having a spring or equivalent interposed between it and the fence, substantially as described, and for the purpose set forth.

5th, Balancing the tumblers, or, as the equivalent thereof, disconcerting the preponderating weight relatively to the slots for the fence, substantially as and for the purpose specified.

6th, A sliding and rotating spindle, which both shoots the bolt and revolves the tumblers, as described, and is provided with a cylindrical cavity, as specified, in combination with a stationary arbor of greater length than the space occupied by the pack of tumblers, and projecting into the cylindrical cavity of the spindle, the combination being substantially such as hereinbefore set forth.

7th, Combining, with the case which contains the tumblers, and which is fitted to the tubular projection from the lock frame, so that it can be inserted therein and removed therefrom for the purpose of changing the combination, a spring bolt or latch controlled by a separating lock, substantially as and for the purpose described.

8th, Making the knob hollow and threaded on the inside to receive the threaded portion of the spindle to such an extent that it can be fitted to doors of various thicknesses, and then prevented from turning, the one on the other, by a feather key, as described.

82,193.—APPARATUS FOR TOLLING GRAIN.—James Armstrong, Bucyrus, Ohio.

I claim the combination of the box, A, with partitions or chutes, e f g, the spout, k, and the gage, l, when constructed and arranged as and for the purpose herein set forth.

82,194.—PROCESS OF REFINING CAST IRON.—Haydn M. Baker, Harlem, N. Y.

I claim the use of solid and fusible insoluble silicates of soda, potash, and other bases, consisting of silicate of lime, magnesia, barytes, strontian, lead, and bismuth, or mixtures of same, for the purpose of removing silica, sulphur, carbon, and metallic oxides from iron at very elevated temperatures, in the manner herein described and for the purposes fully set forth.

82,195.—VAPOR CONDENSER FOR LARD-RENDERING KETTLES.—Wm. M. Bartram, Philadelphia, Pa.

I claim, 1st, The employment of the air tube g, through which air is forced by a bellows, or other equivalent means, into the cap, D, above the fire, in combination with the gooseneck, E, condensers, F and G, and pipe, S, leading into the chimney, whereby a part of the vapor is condensed, and the uncondensed vapor is carried up the chimney, substantially as set forth.

2d, The arrangement of the kettle, C, cap, D, air tube, g, condensers, F and G, pipes, I J N K, conduit pipe, m, discharge pipes, t t' L, and pipe, S, all constructed and operated in the manner and for the purpose set forth.

82,196.—LAMP.—John Bellerjeau, Philadelphia, Pa.

I claim pendent springs, B, terminating in hooks or rests, C, when attached to the lower side of an annular plate, F, having an annular hole, A, in its center, substantially as and for the purpose herein shown and described.

82,197.—WATCH.—P. R. Bennett, Jr., Urbana, Ohio.

I claim suspending the jewel or bush of a watch by means of lateral springs placed about the same, substantially in the manner and for the purpose herein set forth.

82,198.—STEAM GENERATOR.—Auguste L. Bezy and Isidore A. Desnoyers, Paris, France.

We claim, 1st, The arrangement of the inner and outer casings of a steam boiler eccentrically to each other, for the purpose set forth.

2d, A boiler the outer shell of which consists of two or more flanged sections, constructed and so secured together by screw bolts as to be detachable from each other, substantially as herein set forth, for the purpose described.

82,199.—RAILWAY SAFETY ATTACHMENT.—H. S. Blood, Jefferson, La.

I claim the combination of a railroad car with the fender wheels, A A, the shaft, I, and the frame, B, when these parts are constructed, arranged, and operate substantially as herein described, for the purpose set forth.

82,200.—FEATHER RENOVATOR.—Amos Bond (assignor to himself and A. D. Moore), Chicopee, Mass.

I claim, 1st, The combination of the revolving feather holder, A, dryer, C, steam chest, D, tubes, I, valve seat, E, two-way valve, F, valve seat, H, blow-off pipe, G, exhaust valve, G', reservoir, K, and pipe, J, substantially as and for the purpose described.

2d, The removable partition, P, applied to the revolving feather holder, A, to form compartments therein, substantially as described.

3d, The slotted or sawn caps, applied to the outer ends of the tubes, I, when the latter are applied to the steam chest, D, and dryer, C, substantially as and for the purpose set forth.

82,201.—SKATE.—Joseph Bourke, Curraghleagh, Ireland.

I claim the combination of the perforated plate, C, and hooked rod, D', with the movable sole plate, B, lips, b' b', and heel plates, E E2 all arranged to operate substantially as and for the purpose herein described.

82,202.—MANUFACTURE OF ARTIFICIAL STONE.—Wm. K. Boyle, Brookville, Md. Antedated Sept. 7, 1868.

I claim the herein described process of manufacturing artificial stone, by means of which the insoluble silicate of lime is formed, by the double decomposition of the silicate of potash and nitrate of lime, substantially as herein set forth and described.

And, as a secondary result, the utilization of the nitrate of potash, as a waste material, in the manufacture of artificial stone, as herein set forth and described.

82,203.—TOP PROP FOR CARRIAGES.—F. A. Bradley (assignor to himself, James G. English, and E. F. Mersick), New Haven, Conn.

I claim, 1st, In combination with a stud, A, of other than cylindrical form, the sleeve, F, formed with the flange, a, and the nut, G, arranged so as to bear against the said flange, substantially as herein set forth.

2d, In combination with the stud, A, formed upon the plate, B, the covering plate, D, with its neck or projection, E, when constructed and arranged so as to cover the plate, B, substantially in the manner herein set forth.

82,204.—PORTABLE PLATFORM SCALE.—H. K. Bugbee, Williamstown, N. J.

I claim, 1st, The levers, G and H, having their fulcra on plates, J, which rest upon adjustable standards, A and A', or directly upon the surface of the ground or floor, in combination with a graduated scale beam, and the within described appliances, or their equivalents, connected therewith, all substantially as and for the purpose set forth.

2d, In combination with the above, the bars, L, or platform, for the purpose specified.

3d, The frame, D, with its fixed and movable arms, h and h', for the purpose specified.

82,205.—HOG CHOLERA MEDICINE.—A. J. Carver and E. P. Horn, Greenhill, Tenn.

We claim the aforesaid medicinal compound for the cure and prevention of hog cholera.

82,206.—GLOBE VALVE.—Wm. Chesley, Cincinnati, Ohio.

I claim, 1st, The bolt, D, screwed into the disk, e, of the seat, B, and drawing said seat in the direction of the pressure of the valve, as and for the purpose specified.

2d, The valve, C, with groove, G, depressions, I I, and lining, L, of brass or any other suitable material, substantially as and for the purpose described.

82,207.—HAND RAKE.—Holley M. Clark, Brewer, Me.

I claim the shafts, A B, wheel, D, tie, C, cross beam, E, and arms, F F F F, in combination with the rotating rake, G d d d, all constructed and operating substantially in the manner and for the purposes shown and described.

82,208.—APPARATUS FOR BREWING MALT LIQUOR.—Paul Conday, Philadelphia, Pa., assignor to himself and Chas. F. Leisen.

I claim an apparatus, so constructed that the steam rising from the brewing boiler during the process of brewing may be used for the purpose of heating and preparing the wort for each succeeding brewing, as described.

82,209.—BUSK OR STAY FOR CORSET.—Thomas B. De Forest, Birmingham, Conn.

I claim a dress or corset busk, of paper or similar fibrous material, having inserted longitudinally therein a metallic spring, substantially as set forth, as a new article of manufacture.

82,210.—RAILROAD CAR HEATER.—W. B. Farwell, New York, assignor to himself and Chas. R. Abbott, Elmira, N. Y.

I claim, 1st, The universal joints, D D, and the pipes, B B and C, applied to the permanent or fixed pipes, A x, of the cars, for the purpose of forming a steam tight connection between the pipes of the cars, and admitting of a free vertical, lateral, and longitudinal play or movement of the latter, substantially as set forth.

2d, The placing of the coiled or sinuous portion of the steam pipes, A x, in inclined positions, with water receptacles, G, communicating with them at their connecting points, said receptacles being provided with valves or siphons, so arranged as to admit of the discharge of the water of condensation at proper intervals, without permitting the escape of steam, substantially as set forth.

82,211.—CUTTER HEAD.—Samuel Fawcett, Rochester, N. Y.

I claim the rotary cutter head, having one or more wings for holding the knives, made adjustable longitudinally, constructed to operate substantially as described.

82,212.—LINIMENT.—Heinrich Fedder, Lancaster, N. Y.

I claim the liniment, made of the ingredients and in the manner substantially as described.

82,213.—DEVICE FOR MEASURING THE FEET OF HORSES.—H. B. Ferren, Batavia, N. Y.

I claim, 1st, In combination with a device, as above described, for taking an accurate measure of the form of a horse's hoof, the arrangement of the index headed screw, E, center screw, a, and point, e, in a straight line, so as to certainly adjust the measure to the center of the foot, as described.

2d, In combination with a device for measuring the hoof of a horse, the slides, G, constructed as described, the index headed bolt, E, and wheel, F arranged and operating as described.

82,214.—DEVICE FOR MEASURING THE FEET OF HORSES.—H. B. Ferren, Batavia, N. Y.

I claim, in combination with the slides, F F, the adjustable slide, C, and the adjustable heel slides, D D, as described, all secured to the one center screw, B, as and for the purpose described.

82,215.—DEVICE FOR ATTACHING SHOES TO HORSES' FEET.—Horace B. Ferren, Batavia, N. Y.

I claim, 1st, In combination with a shoe provided with an upward projecting flange at the heel, as shown in the patent to Tyrrell, one or more spring bands, D, fastened by nuts, or their equivalents, to said flanges, substantially as set forth.

2d, The bars, C C, constructed as described, with a screw at the lower end to be inserted in a horse shoe, and a loop, or its equivalent, at the upper end, for the purpose of holding a band, so that the shoe may be attached to a horse's foot by the same, substantially as herein set forth.

82,216.—CHURN DASHER.—Elliot H. Funk, Newark, Ohio.

I claim the pivoted swinging wings, g g, in combination with the break boards, h h, and dash boards, d d, all arranged substantially in the manner and for the purpose set forth.

82,217.—APPARATUS FOR DETACHING HORSES FROM CARRIAGES.—George Gabriel (assignor to himself and Philip Wisenberger) Pittsburg, Pa.

I claim, 1st, The plate, C, having the lock, E, pin, h, and eyes, a a' a'', substantially as described.

2d, The combination of the plate, C, the bars, D and F, constructed and operating substantially as described.

82,218.—BED BOTTOM.—Geo. L. Gerard, New Haven, Conn.

I claim the arrangement of the plate or strip, d, and buttons, f and g, with the spring, C, and slats, A and B, the parts being made and used as and for the purpose specified.

82,219.—LAMP FEEDER.—T. B. Gibbons, Baltimore, Md.

I claim, 1st, The lamp feeder, D, when constructed with the tube, J, extending from the end of the nozzle around to the rear side of the body of the can near its top, and thence through the wall of the can into its interior, and operating substantially as described.

2d, The combination of the cock, N, having the orifice, o, with the nozzle, d3, having the two passages, n n', by which, at the same time that the liquid is delivered from the can, D, to the lamp, A, the gas in the latter is conveyed to the upper part of the can, without escaping around the nozzle, and in the manner described.

82,220.—BRAKE FOR YARN BEAM OF LOOMS.—Joseph John Harrison and Edward Harrison, Broughton, England.

I claim, 1st, The chains or bands, f, bearing on the ends of the warp roller, and secured to a bar, m, in combination with the within-described devices, or their equivalents, for adjusting the bar and securing it after adjustment, for the purpose specified.

2d, The combination of the above and the springs, l, connected to the bands or chains, f, for the purpose described.

82,221.—STEP LADDER JOINT.—Shubael E. Hewes, Albany, N. Y.

I claim the joint, composed of the foot, c c, the round, s, the button, B B and the matrix, a a, substantially in the manner and for the purpose above described.

82,222.—LOW WATER INDICATOR.—George M. Hopkins, Albion, N. Y.

I claim, 1st, The vessel, A, in combination with the pipes, B B and C C, and the swivel joints, D D and E F, operating in the manner substantially as shown and described.

2d, The stop cocks, I and O, having the spring catches, L L, in combination with the vessel, A, arranged to operate substantially as shown and described.

3d, The vessel, A, in combination with the whistle, P, and intermediate devices for giving alarm and regulating the supply of water, as above set forth.

82,223.—GANG PLOW.—Charles L. Horn, Jr., and Leonard Mancy, St. Morgan, Ill., assignors to Leonard Mancy.

I claim, 1st, The frame, A A1 A2, the wheels, B and B1, adjustable arm, b b1, post, B2 and braces, B3, when combined and arranged as herein shown and described.

2d, The plow beams, C, their posts, C1, and the frame beam, A2, when constructed substantially as herein shown and described, and for the purpose set forth.

3d, The beams, C, post, D, and seat, D', when constructed and arranged as herein shown and described.

4th, The arrangement of the beams, C, rod, E, and lever, E', in the manner and for the purpose herein described and set forth.

82,224.—DEVICE FOR FILLING MARSHES.—George Howell and William Smith, Philadelphia, Pa., assignors to George Howell.

We claim, 1st, The combination and arrangement of the case, B, constructed as described, with the screw, A, substantially in the manner hereinbefore described and for the purpose set forth.

2d, The combination of the perforated pipes, J, with the case, B, substantially as for the purpose above described.

82,225.—WATER WHEEL.—John Hoyt, Hughsonville, N. Y.

I claim an outward discharge water wheel, constructed as described, namely, having a top plate, B, inverted cone, F, buckets, d d, and rim, D, all constructed and arranged in relation to each other, substantially as herein described.

82,226.—RAILWAY SNOW PLOW.—Jenkins Jones, and T. G. Elswald, Providence, R. I.

We claim the arrangement of the frame, A, constructed as above described, with the apron, G, and the deflector, E, substantially as herein set forth.

82,227.—BELT FASTENING.—Timothy Kennedy, Mount Carmel, Conn.

I claim the springs, D D, provided with bosses, a a, and fitting transversely against the under side of the belts, in line with the perforated edges of the single top plate, A, the bosses, a a, being adapted to receive the ends of the screws passing through the top plate and belts, as herein described for the purpose specified.

82,228.—ILLUMINATING DAMPER.—John H. Keyser, New York city.

I claim, 1st, The door, A, constructed with openings, h, and mica holding ribs, g g', substantially as described.

2d, The mica holding plate, D, interposed between door, A, and plate, B, substantially as described.

3d, Providing an illuminated door or window for a stove with fixed mica lights, d, and movable mica lights, d', substantially as described and shown.

82,229.—GATE.—John H. King, Smithfield, Ind.

I claim, 1st, The combination and arrangement of the pins, d1 d2, plates, d, sliding bolt, E, concealed spring, F, and weighted lever, G, when constructed and operating as described.

2d, The combination of pins, d1 d2, plates, d, sliding bolt, E, concealed spring, F, weighted lever, G, hinged prop, H, and catch, g, arranged and operating as described.

82,230.—BOTTLE STOPPER.—John Klee, Dayton, Ohio.

I claim the stopper or plug, B, made conical or tapering at both ends, and provided at one end with the rubber packing disk, A, arranged as described, and secured by a tack, F, all as and for the purpose herein set forth.

82,231.—ATTACHMENT FOR GAS BURNERS.—Julius Kopp, Hoboken, N. J.

I claim an adjustable cap, A, constructed of woven or perforated metals, with flanges, A'' A'' A'', substantially as and for the purpose set forth as an article of manufacture.

82,232.—FAUCET.—B. F. Kraft, Reading, Pa.

I claim the combination and arrangement of the induction passage, a, valve, b, spring, d, handle, D, three cornered piece, E, and eduction-passage, i, the whole being constructed and operated as set forth.

82,233.—WHIFFLE TREE SWIVEL.—M. F. Lanning, White House, N. J.

I claim the movable swivel, D, constructed as described, with one end longer than the other, and pivoted to the end of the iron, B, for the purpose of attaching trace to a whiffle tree, substantially as herein set forth.

82,234.—TREE BOX.—J. W. L. Letherbury, Sandoval, Ill.

I claim a tree wrapper constructed and operating substantially as described.

82,235.—CHURN.—Henry Leber, Bellfair Mills, Va.

I claim the herein described triangular form of paddles, arranged in alternate ranks, in opposite position, as relates to their angles upon the shaft, as herein shown and described.

82,236.—CARPET LINING.—Miles Mayall, Roxbury, Mass., assignor, by mesne assignment, to George W. Mayall. Antedated June 27th, 1868.

I claim, as an article of manufacture, an under lining for a carpet, constructed from an elastic fibrous material, placed between the surfaces, one of paper and the other of a thin, open-woven fabric, and having perforations through the whole, substantially as described.

82,237.—MACHINE FOR BENDING WOOD.—Josiah F. Melcher, Bloomington, Ill.

I claim the construction and arrangement of the cross beam, C, tables, F F' and frame, D D', substantially as shown and described.

82,238.—PROCESS OF DEBRANNING WHEAT.—John G. Moxey (assignor to himself, Henry C. Carey, and Abraham Hart), Philadelphia, Pa.

I claim the within described improved process of debranning wheat, that is to say, subjecting the grain, without the use of steam, and while in a dry state, to the action of the blades, in the manner described.

82,239.—DROP TUBE STEAM GENERATOR.—Joseph Nason, New York city, assignor to himself, Charles H. James, and Frank Millward, Cincinnati, Ohio.

I claim, 1st, The within described extension of the drop tube upward above

the upper surface of the tube sheet, A, and the provision for allowing a current of water to enter through the side of such extension, and descend through an inclosed passage or tube, d, combined and arranged substantially as and for the purpose herein set forth.

2d, In connection with the above, making the extended top, D', in a separate piece from the main drop tube, D, and adapted to serve, relatively to the other parts, substantially in the manner and for the purpose herein specified.

82,240.—SAW SHARPENING DEVICE.—A. M. Newman, Terre Haute, Ind.

I claim, 1st, The adjustable standards, B B, provided with heads, C C, and washers, e e, for the purpose of securing the files, and adapting the machine to different sized files, substantially as and for the purposes herein set forth.

2d, The combination of the slotted bar, A, standards, B B, handles, D D, rod d, guides, l l, constructed and operating substantially as and for the purposes herein set forth.

82,241.—FOUR-WHEEL PLOW.—Nelson B. Norton, Burlington, Wis.

I claim, 1st, The arrangement of the lever, H, jaws, I, and metallic straps, K, with the plow beam, F, frame, C, post or standard, L, straps, M, and catch h, when constructed and used as and for the purpose set forth.

2d, The adjustable rod, g, in combination with the frame, C, and plow beam, F, when arranged as and for the purpose specified.

82,242.—LIME KILN.—W. C. Pettijohn, St. Louis, Mo.

I claim the arrangement of the kiln, A, having the chamber, A', grate, a, ash pit, B, side aperture, a', metallic dome, D, constructed in two parts, and having the smoke exit, d2, all combined substantially as herein set forth.

82,243.—MACHINE FOR FORMING BUTTONS.—S. G. Pitts (assignor to himself and W. L. Palmer), Leominster, Mass.

I claim the combination of, as well as the arrangement of, one or two sets of mandrels, A B, the toothed rack or carrier, L, and its supporting rail, K, and the clamps, M M, the whole being provided with mechanism for operating the rack, mandrels, and clamps, substantially as described.

82,244.—APPARATUS FOR CARBURETING AIR.—J. T. Plass and R. H. Plass, New York city.

We claim, 1st, The gate, E, in combination with the fluid trap, c2, constructed as described, for regulating the supply of hydrocarbon to the evaporating chamber, and returning the surplus to the reserve chamber, substantially as set forth.

2d, The tubular stem of the hollow cone valve, G, for the insertion of shot or other suitable weights, for adjusting the pressure in the gasometer, substantially as set forth.

82,245.—BLIND HINGE.—R. B. Prindle, Norwich, N. Y.

I claim a self-locking blind hinge, formed by combining the pin, G, with its conical base, and a corresponding seat in the disk, F, with the shoulder, H, engaging the leaf, D, in the manner and for the purpose substantially as herein shown and described.

82,246.—ANIMAL TRAP.—H. W. Prouty (assignor to himself and Howard Tilden), Boston, Mass.

I claim the arrangement of the arms, D D, spears, K K, bait rod, L, and bait cup C, in combination with the spring, F, and catch, G, the whole being constructed and arranged upon a block or frame, substantially as described and for the purpose set forth.

82,247.—TABLE.—J. C. Putnam, Worcester, Mass.

I claim, 1st, The construction of the top, B, the pieces, C C, for supporting the top, in connection with the slide, R, substantially as set forth and described.

2d, The combination of the movable legs, leaves, drawer or drawers, and a fastening mechanism that holds both drawer and leaves, substantially as set forth and described.

82,248.—BRICK KILN.—S. D. Rader, Williamsport, Pa.

I claim the arrangement of the kiln, A, end furnaces, C, and long side furnaces, B, composed of a series of small fireplaces, o o o, and provided with draft holes, l l, at the side and ends, all constructed substantially as and for the purposes herein set forth.

82,249.—GAS BURNING FURNACE FOR STEAM GENERATORS.—John T. Rich, Philadelphia, Pa. Antedated July 8, 1868.

I claim, 1st, So arranging a furnace that the coal shall be subjected to distillation before it enters the fire box, and at the same time so arranging the draft or blast that the gases thus evolved shall be thoroughly mingled with atmospheric air or air and steam within the furnace, but before entering the fire box or combustion chamber to be consumed, substantially as described.

2d, The chute, C, extending in the form of a tube into the fire chamber and serving as a retort, for the purpose of distilling the coal retained in the tube by means of the heat of the fire box, in combination with a draft pipe, F F', substantially as set forth.

3d, The steam blast, , so arranged in relation to the tube or retort in which the coal is subjected to distillation, that the wet steam and atmospheric air shall be mingled with the gaseous products of the coal before entering the fire box, substantially as set forth.

4th, The arches or diaphragms, G, when constructed of a refractory substance, and extending entirely across the fire-box, and perforated with openings, K, substantially as and for the purpose set forth.

5th, Double perforated arches or diaphragms, G, in combination with intermediate openings, P, through the external walls.

6th, The combination of the chute, C, extending into the fire-box, to act as a retort in the distillation of the coals and arches or diaphragms, G, so located within the fire-box as to reflect the heat upon such retort, substantially as set forth.

7th, The steam blower, constructed with concentric funnels, N, extending successively from the center, one beyond the other, and discharging the currents passing between them into a tubular extension, F', of the outer case, F, substantially as set forth.

82,250.—COMBINED CORN SHELLER AND APPLE GRINDER.—M. H. Ripley and William N. Temple, Minneapolis, Minn.

We claim the combination of the tapering and concaved-toothed cylinder, B, guide, F, springs, G, gears, D E, and frame, A, with its spouts, I J, when the several parts are constructed and arranged in the manner specified.

82,251.—BIT STOCK.—Clemens B. Rose, Sunderland, Mass.

I claim the handle, A, constructed of the two pieces applied to the stock, B, as described, and secured by the ferrules, C, all substantially as herein set forth.

82,252.—MACHINE FOR THREADING BOLTS.—J. Schuessler, and John Kennedy, La Fayette, Ind., assignor to John Schuessler.

We claim, 1st, the arrangement, herein described of the hollow slotted mandrel, B, the grooved reciprocating head, E, and the cutters, C.

2d, The combination of the devices set forth in the foregoing clause, with the lever, F and graduated quadrant, M, substantially as set forth.

81,253.—HARVESTER.—Thomson C. Sebring, Milford, Mich.

I claim, 1st, The employment in grass and grain harvesters, of a round cast-iron main frame, F, constructed substantially in the manner and for the purposes herein shown and described.

2d, In combination with the main frame, F, the cover or cap, C, substantially as shown and described, for the purpose of entirely encasing the gearing of the machine, and protecting it from dust and dirt.

3d, In combination with the horizontal bevel wheel, W, the box or step, s, and adjusting screw, v.

4th, The annular pawl, p, provided with the inclined plane, e, arranged and operating substantially in the manner and for the purposes herein shown and described.

5th, The arrangement of the spring, f, as shown, and operating in the manner and for the purposes described.

6th, The hand lever, Y, pivoted to the head H, of the cutter bar, and operating substantially in the manner and for the purposes herein shown and described.

7th, Pivoting the rear end, b", of the cutter bar head, H, in the shoe, S, with a spherical joint to permit any necessary vertical change in the elevation of the outer end of the cutter bar, and also of the front side, substantially in the manner and for the purposes herein shown and described.

8th, The adjustable gate, a", secured to the standard, J", of the shoe, S, arranged to operate as herein described.

82,254.—COMPOSITION FOR STUFFING AND FILLING WOOD.—Jacob Sheller, Wilmington, Del.

I claim the combination of the within named ingredients, when mixed in the several quantities and proportions, as herein described and for the purpose set forth.

82,255.—FILTER.—Thomas Simmons, Brooklyn, N. Y.

I claim, 1st, The case, A, provided with a movable head, and each of its heads being provided with the pipes, D D, upon which screw threads are formed, so that the filter can be reversed and cleansed, substantially as set forth.

2d, The frame, C, as constructed and combined with the case, A, and pipes D D and G, when used with a force pump as and for the purpose set forth.

82,256.—COMBINED CLOTHES-HORSE, ETC.—Henry L. Stillson, Plattsburg, N. Y.

I claim 1st, The four armed rollers D D, constructed as described, with a series of holes through one of the arms, and provided with ratchet wheels, E, and journals, n n, which revolve between the side pieces, A A, substantially as and for the purposes herein set forth.

2d, The combination of the grooved supports, A A, with the top, B, and board, G, and rails, F, when they are adjustable, and all constructed as and for the purposes herein set forth.

82,257.—SAWING MACHINE.—Hiram Thompson (assignor to R. Hall & Co.), Worcester, Mass.

I claim, 1st, The combination and arrangement, with the saw-arbors, E E, or either, and the stationary disks, K K, of the movable disks, F F, substantially as and for the purposes set forth.

2d, The arrangement of the binding pulley, U, in relation to the belt, N, pulley, O, and saw arbors, E E, suostantially as and for the purposes set forth.

82,258.—REVOLVING FIRE-ARM.—F. Alexander Thuer, East Hartford, assignor to Colt's Fire-arms Manufacturing Company, Hartford, Conn.

I claim, 1st, The laterally movable piece, g, containing the firing pin, i, in combination with the rotating-chambered breech and the hammer of a revolver, substantially as described, and for a safety device.

2d, A laterally movable plate, located between the hammer and cylinder of a revolver, and bearing the shell ejector, substantially as and for the purpose hereinbefore set forth.

3d, The combination of a movable piece, supporting both the firing-pin and an ejector, with the hammer of a revolver, and with a rotating breech, having chambers open at the rear, when arranged to permit the use at will of the hammer either as a means of igniting the charges or of expelling the empty shells from the chambers, substantially as hereinbefore specified.

82,259.—CLOTHES WRINGER.—Josiah Webb, Spartansburg, Pa.

I claim constructing the rolls, B B', of the wooden cylinder, D, the coating of pitch and sand, m, and the spirally-wound coil of rubber, o, arranged in the manner and for the purposes specified.

82,260.—MANUFACTURE OF ARTIFICIAL STONE.—Demetry Mindeleff, Washington, D. C.

I claim the herein described improvement in artificial stone.

82,261.—CIDER MILL.—Charles Wilson, Clinton, Pa. Antedated September 4, 1868.

I claim the combination and arrangement of the endless roller belt, C, hopper, A, revolving bottom, D, and circular upright frame, G, when constructed, arranged, combined, and operated as herein described, and for the purposes set forth.

82,262.—VAPOR BURNER.—Christoph Wintergerst, Mobile, Ala.

I claim the arrangement of the reservoir, A, curved tube, B, burner, C, screws, G F, ring, E, and plate, D, whereby a light is produced and so divided that a larger and brighter flame is formed, all as herein specified.

82,263.—STILL FOR TURPENTINE.—J. E. Winants, Brooklyn, N. Y., and John F. Griffin, New York city.

We claim, 1st, The process, substantially as described, of distilling the crude material and extracting the fumes at a low temperature, and carrying them off from the lower portion of the still, as and for the purposes set forth.

2d, The employment, in combination with the chamber or case of the still, of a steam heated rotating agitator cylinder, into and through which the crude material passes during the process of distillation, substantially as described.

3d, The employment, in combination with the melting chamber, of one or more heated barrel supporters, F, adapted to hold and melt out the contents of the barrels, substantially as hereinbefore described.

4th, The employment of steam tubes so perforated as to eject the live steam on to those surfaces which are required to radiate the greatest quantity of heat, substantially as herein set forth.

82,264.—WATER ELEVATOR.—C. P. Woodruff, Newbern, Tenn.

I claim, 1st, The cylinder, C, constructed with the central partition or wall, C', when employed in combination with the sliding shaft, F, and the tubular bearings, e e, substantially as described.

2d, The arrangement of the spring, s, tubular bearings, e e, shaft, F, clutch, m, partition, C', and cylinder, substantially as described and shown.

82,265.—SAWING MACHINE.—Oscar E. Moore, Corunna, Mich., administrator of the estate of Samuel Yarion, deceased.

I claim the guides, b, affixed to or forming part of a wheel, R, or its equivalent, in combination with a saw shaft, P, operating substantially as described, for the purpose specified.

82,266.—CLOCK.—John B. Mayer, Niagara Falls, N. Y.

I claim, 1st, The arrangement of the wheel, A, pinion, E, escapement wheel, D, with the hour, minute, and second hands upon axis of said escapement wheel, substantially as herein described.

2d, In combination therewith, the ratchet wheels, k l, revolving tooth, l', pin, l, and wheel, G, operating substantially as and for the purpose described.

82,267.—STRIKING MECHANISM FOR CLOCKS.—John B Mayer, Niagara Falls, assignor to himself and Tobias Witmer, Williamsville N.Y.

I claim, 1st, The spur wheel, D, in combination with the pins, v v v, and the pinion, F', the tumbler wheel, E, the spur wheel, F, the pinion and fly wheel, G, in combination with the hammer tails, o1 p1, in order to effect the striking of quarters and hours on separate bells, as set forth.

2d, The combination of locking plates, B and C, and locking wheel, A, for controlling the action of the hour and quarter hour hammers on two or more separate bells.

3d, The combination and arrangement of the sliding shafts, O and P, lever, q, hammer tails, o1 and p1, springs, o2 and p2, and pin wheel, D, for the purpose substantially as herein described.

4th, The lever, R, in combination with the locking plate, C, and sliding hammer shaft, P, for the purpose of shifting the said hammer shaft, and alternating the action of the hammers on the bells.

REISSUES.

79,298.—MANUFACTURING GLASSWARE WITH HANDLES.—Dated June 30, 1868; reissue 3,116.—J. S. Atterbury and T. B. Atterbury, Pittsburgh, Pa.

We claim, 1st, Producing handles for glass lamps and other glassware by casting them in molds ready to be attached to such articles, substantially as described.

2d, The manner, substantially as described, of attaching glass handles to lamps or other articles of glass, in the process of blowing such articles in a mold, substantially as described.

3d, Guiding hot flexible glass, as it drops or descends from the "punty" or pipe of the operator, to the point of attachment on the bowl or other article, by means of a mold which shapes the handle.

4th, Dropping hot flexible glass into a mold for the purpose of forming a handle or handles for the bowl of a lamp or other vessel.

5th, A glass lamp or other article in glass having a molded or cast handle and a blown body, produced substantially as described.

51,991.—BREECH-LOADER.—Dated January 9, 1866; reissue, 3,117.—Berdan Fire-Arms Manufacturing Company, New York city, assignees of Hiram Berdan.

We claim, 1st, The employment, in a breech-loading fire-arm, of a device, so applied and operated as to press back the cartridge against the face of the breech preparatory to firing, substantially as and for the purpose herein described.

2, So applying and operating the cartridge shell refractor of a breech-loading fire-arm, that it shall serve the purpose of pressing back the cartridge against the face of the breech preparatory to firing, substantially as herein specified.

3d, So arranging the detonating pin of a breech-loading fire-arm, that it shall strike the back of the head of the cartridge opposite to where it is supported by a movable device, which serves the purpose of pressing back the cartridge against the breech, substantially as herein set forth.

4th, The elongation of the hole provided in the swinging breech, for the reception of the pin upon which it swings, whereby the breech has a direct support in the breech receiver at the time of firing, and yet is free to swing back loosely, to open the barrel for reloading, substantially as herein set forth.

5th, The relative position and arrangement to each other of the hammer, firing-pin, swinging breech, and line of bore, by which the line of bore is unobstructed and the loading facilitated when the hammer is at half cock, substantially as herein described.

6th, The combination, with one main spring, of two or more stirrups, one or more connecting the tumbler or hammer, and the other connecting a brace, for locking the breech when the hammer is down, substantially as herein set forth.

7th, In combination with a swinging breech piece, the employment of a suitable projection on the lower or front side of the brace or tumbler, whereby the loading at full cock is prevented, substantially as and for the purpose herein specified.

8th, So constructing and applying a brace to a swinging breech, for breech loading fire-arms, that it swings on a tumbler shaft detached from the tumbler, but is attached to the main spring in such a way as to give a greater motion to the brace than is given to the tumbler.

9th, So combining a movable brace, which operates to lock the breech at the time of firing, a three-notched tumbler, and a swinging breech, in a breech loading fire-arm, that while the hammer is locked by the sere in the first or safety notch, the breech is locked in a closed condition by the said brace, substantially as herein set forth.

10th, The combination of the flanged breech receiver or lock frame, A, the pins upon which the hammer, breech, and sere work, and the cheek pieces of the stock, by which the pins are held in place, substantially as herein described and for the purpose herein set forth.

51,991.—BREECH-LOADER.—Dated Jan. 9, 1866; reissue 3,118.—Division B.—Berdan Fire-Arms Manufacturing Company, New York city, assignees of Hiram Berdan.

We claim the recess, a, provided in the hub or hinged portion of the breech piece, in such relation to the barrel or chamber as is herein described, for the purpose set forth.

78,932.—PRESERVING MEATS, FRUIT, ETC.—Dated June 16, 1868; reissue 3,119.—Wm. Davis, Samuel H. Davis, and David W. Davis, Detroit, Mich., assignees of Wm. Davis.

We claim, 1st, The construction of a car body, ship's hold, room box, or chest provided with compartments, A B C, ice receptacle, D, chimney, E, and hatches, G, when arranged and operating substantially as described for the purposes set forth.

2d, The goose neck trap, F, or equivalent, in combination with receptacle, D, and compartments, A B C, when arranged substantially as and for the purposes set forth.

3d, The receptacle, D, for the freezing mixture, so constructed and arranged as to be pendent from the inner upper wall of chamber, C, and allowing a free circulation underneath the receptacle and on all sides, substantially as described.

4th, The construction and relative arrangement of the ice receptacle, D, with the chamber, C, whereby the moisture in said chamber, C, is frozen to the wall of receptacle, D, substantially in the manner and by the means described.

62,683.—ALARM LOCK.—Dated March 5, 1867; reissue 3,120.—James S. Porter and Russel Porter, Waterford, N. Y.

We claim, 1st, The cam or stop, P, which, by being properly set, offers an obstruction to the turning of the key, substantially as described.

2, The pistol, C, hammer, G, latch, H, and trigger, L, when all arranged and combined within the interior of a lock casing, provided with a cover, o, and plug, F, substantially in the manner and for the purpose described.

78,132.—PLANER CHUCK.—Dated May 19, 1868; reissue 3,121.—Charles H. Riggs, Windsor Locks, Conn.

I claim, 1st, In combination with the movable jaw, B, and slotted chuck bed, b, the eccentric shaft, D, with eye bolts, E E, and nuts, G G, arranged towards the front of the jaw, the jaw being constructed with a back surface equally as high as the front, or surface next to the stock, substantially as herein shown, and for the purpose set forth.

2d, The device for fastening the chuck to the base plate, M, consisting of the plate, K, with annular groove, bed plate, L, angle irons, O, threaded pin, B, with nut, and groove, Q, in base plate, M, all constructed and arranged in the manner described.

3d, The arrangement of the round or dove-tailed nuts, R R, screws, J J, stationary jaw, C, and the movable jaw, B, substantially as shown and set forth.

79,865.—GRINDING PLATE FOR GRIST MILLS.—Dated July 14, 1868; reissue 3,122.—Henry Shaw and Wm. D. Leavitt, New Orleans, La.

We claim the combination and arrangement of the cast iron grinding plate B, the unyielding non-conducting paper packing, C, and back plate, D, all constructed and secured together substantially in the manner and for the purpose herein described.

78,404.—RAILWAY RAIL AND SPLICE.—Dated May 26, 1868; reissue 3,123.—Zalmon B. Wakeman, Rockford, Ill.

I claim, 1st, The hollow shell rail, A, when the sides are curved in toward each other so as to receive and retain the block, B, as and for the purposes set forth.

2d, The combination of the hollow rails, A, with the connecting block, B, provided with a removable bar or key, b, substantially as herein set forth and shown.

46,771.—APPARATUS FOR CARBURETING AIR OR GASES.—Dated March 14, 1865; reissue 3,124.—John A. Bassett, Salem, Mass.

I claim, 1st, The general arrangement and construction of the apparatus consisting of the several parts shown and described.

2d, The carburation of air or gases by the use of perforated plates or cylinders, with the fibrous material partially immersed in the hydrocarbon liquid, substantially in the manner as set forth and shown.

3d, The automatic regulation of the air to be admitted to the holder and carbureter, by means of a valve connected with and operated by the holder, through the lever and cord, or their equivalents, when used for this purpose, as shown and specified.

4th, A carbureting device placed in the gas-holder tank, in the manner substantially as described.

5th, A carbureting device for enriching air or gases with the vapor of a volatile hydrocarbon, placed in a gas-holder tank, having a seal for the holder independent of the level of the hydrocarbon liquid.

6th, The combination of a device for carbureting air or gases, using capillary materials, with the method of carbureting by forcing the air or gases through the hydrocarbon.

7th, The automatic reservoir for replenishing the hydrocarbon liquid in the carbureting chamber, in combination with a gasometer, substantially as shown and described.

8th, The use of a mercury valve for controlling the admission of air to the carbureting chamber, as set forth and shown.

9th, Forcing air or gas through hydrocarbon liquid, or through capillary materials charged with such liquid, within a gas holder, so as to carburet or enrich the same, substantially as described.

10th, The combination of a gas holder, a vessel to contain hydrocarbon liquid within the gas holder, and an air or gas forcing apparatus, substantially as described.

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2,493.—MANUFACTURE AND FASTENING OF PAPER BAGS.—Joseph Rapson, New Bedford, Mass. Aug. 10, 1868.

2,494.—MACHINE FOR MAKING EYELETS.—James M. Osgood, Somerville, Mass. Aug. 10, 1868.

2,497.—AUTOMATIC INDICATOR FOR STEAM BOILERS.—Edwin L. Bomeisler, Philadelphia, Pa. Aug. 10, 1868.

2,528.—PHOTOGRAPHIC FRAMES, AND MECHANISM FOR MAKING THE SAME.—Garret P. Bergen and Chas. T. Bainbridge, New York city. Aug. 12, 1868.

2,534.—BREECH-LOADING FIRE ARMS AND CARTRIDGES.—Isaac M. Milbank, Greenfield Hill Conn. Aug. 13, 1868.

2,564.—FOG ALARM.—John R. Anderson, Brooklyn, N. Y. Aug. 17, 1868.

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U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 11, 1868.
Jarvis Case, of Lafayette, Ind., having petitioned for an extension of the patent granted him on the 16th day of January, 1855, reissued on the 16th day of November, 1858, and again reissued on the 17th day of April, 1866, for an improvement in "Seed Planters," it is ordered that said petition be heard at this office on the 21st day of December next.
Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
14 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 11, 1868.
George W. Hubbard and William E. Conant, of New York city, having petitioned for an extension of the patent granted them on the 9th day of January, 1855, and reissued on the 18th day of September, 1866, for an improvement in "Operating Slide Valves in Direct-Action Engines," it is ordered that said petition be heard at this office on the 21st day of December, next.
Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
14 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 7, 1868.
B. F. Brown, Dorchester, Mass., having petitioned for an extension of the patent granted him on the 12th day of December 1854, for an improvement in "Hanging Carriage Bodies."
It is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 9, 1868.
Sylvanus Sawyer, of Fitchburg, Mass., having petitioned for an extension of the patent granted him on the 12th day of December, 1854, for an improvement in "Rattan Machine," it is ordered that said petition be heard at this office on the 23d day of November next.
Any person may oppose this extension. Objections, depositions, and other papers, should be filed at this office twenty days before the day of hearing.
13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
Washington, D. C., Sept. 9th, 1868.
James E. Simpson, of Brooklyn, N. Y., having petitioned for an extension of a patent granted him on the 5th day of December, 1854, for an improvement in "Dry Docks," it is ordered that said petition be heard at this office on the 23d day of November next.
Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
Washington, D. C., Sept. 9, 1868.
Charles Danforth, of Paterson, N. J., having petitioned for the extension of a patent granted him on the 12th day of December, 1854, for an improvement in "Throstles for Spinning Cotton," it is ordered that said petition be heard at this office on the 23d day of November next.
Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., August 27, 1868.
Emeline M. Woodruff, late Emeline M. Stedman, of Elizabeth, N. J., executrix of the estate of Geo. W. Stedman, deceased, having petitioned for an extension of the patent granted to said Geo. W. Stedman the 12th day of December, 1854, and reissued the 26th day of April, 1859, for an improvement in "Sewing Machines," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 2, 1868.
Birdsill Holly, of Lockport, N. Y., having petitioned for an extension of the patent granted to him on the 6th day of February, 1855, for an improvement in "Elliptical Rotary Pumps," it is ordered that said petition be heard at this office on the 11th day of January next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Aug. 28, 1868.
Aaron H. Allen, of Boston Mass., having petitioned for an extension of the patent granted to him on the 5th day of December, 18—, for an improvement in "Seats for Public Buildings," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., August 31, 1868.
Jeremiah Stever, Bristol Conn., having petitioned for an extension of the patent granted him on the 12th day of December, 1854, for an improvement in "Machines for Scraping Metals," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Aug 28, 1868.
John Pepper, of Gilford, N. H., having petitioned for an extension of the patent granted to him on the 5th day of December, 1854, and reissued on the 27th day of October, 1863, for an improvement in "Circular Knitting Machines," it is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE
Washington, D. C., Sept 4th, 1868.
Samuel N. Miller, of Dedham, Mass., having petitioned for the extension of the patent granted him on the 29th day of June, 1832, for an improvement in "Combined Anchor," this application having been authorized by Act of Congress, approved July 20, 1868, it is ordered that said petition be heard at this office on the 23d day of November next
Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE.
Washington, D. C., Sept. 1st, 1868.
Cyrenus Wheeler, Jr., of Auburn, N. Y., having petitioned for the extension of a patent granted him on the 5th day of December, 1854; reissued Jan. 5, 1860, in seven divisions, numbered 875, 876, 877, 878, 879, 880, 881, and reissue numbered 876, again reissued May 14, 1867, and numbered 2,610, for an improvement in "Grain and Grass Harvesters," it is ordered that said petition be heard at this office on the 23d day of November next.
Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
12 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE.
Washington, D. C., Sept. 1st, 1868.
Cyrenus Wheeler, Jr., of Auburn, N. Y., having petitioned for the extension of a patent granted him the 6th day of Feb. 1855; reissued June 5, 1860, numbered 971, and again reissued May 28, 1867, and numbered 2,652, for an improvement in "Grain and Grass Harvesters," it is ordered that said petition be heard at this office on the 23d day of November next.
Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
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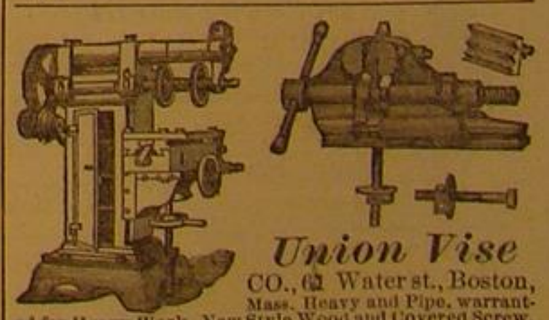

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SCIENTIFIC AMERICAN

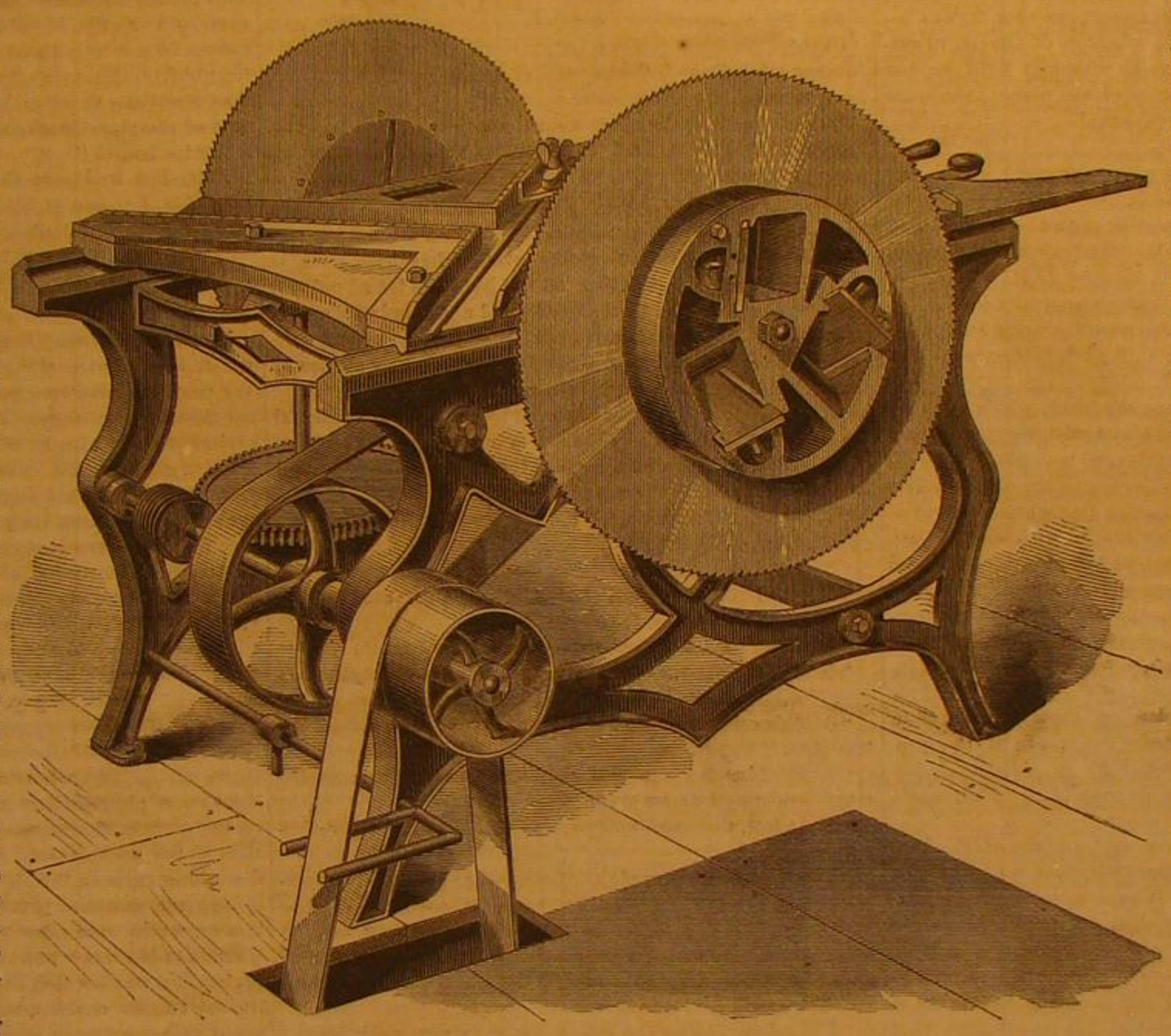
A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES

Vol. XIX.—No. 15. [NEW SERIES.] NEW YORK, OCTOBER 7, 1868. $3 per Annum. [IN ADVANCE.]

Improved Machine for Mitering Frames.

The joints of rectangular frames as picture, looking glass, window, and other frames must be cut at the proper angle before being put together; and to make perfect joints they should be planed as well as sawed. Usually, these two processes are performed on separate machines, and sometimes the fitting is done by a hand plane. The machine, however, which is herewith illustrated performs both these operations at one time, perfectly and with great rapidity.

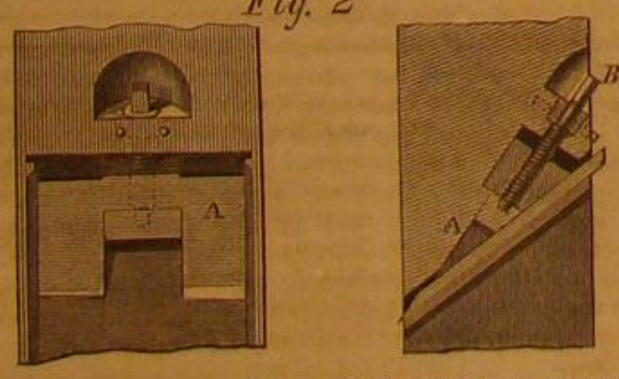
The machine is an iron frame carrying a sliding platen, also of iron, on the top, and having two saws and cutter heads mounted on a single central shaft. This shaft, with its combined saws and cutters, is driven by a belt running on a small pulley on it, driven by a belt running from a larger pulley at the rear of the machine and near the floor, the shaft of which carries a fast and loose pulley. On this shaft is also a worm engaging with a worm gear on an upright shaft, having on its upper end a pinion engaging with a rack fixed to the under side of the sliding platen. This combination is the feed of the platen. The upper journal of the vertical shaft runs in the end of a lever pivoted to a brace under the platen, the other end of the lever being a handle projecting beyond the forward end of the platen. A slight transverse movement of this handle throws the pinion out of gear with the platen rack, and by pressing lightly on the handle of another lever, pivoted to the platen, the under face of the lever being covered with leather, it engages with the top of the saw shaft under the platen and the revolving of the shaft carries the platen rapidly back ready for another forward movement, which is obtained by the action of the pinion and rack thrown into gear. If the automatic feed is not desired, the pinion and rack may be left disengaged, and the platen moved simply by pushing with the hand, as on ordinary sawing machines.



SANDERS' PATENT MITERING MACHINE.

For guiding and holding the stuff to be sawed there are three frames, formed at an angle of 90°, secured to the face of the platen, their raised edges being graduated to inches and their parts, and in a score cut diagonally across the platen is a sliding guide, or holder, that may be held by a thumb nut and bolt at any point desired, to regulate the length of the piece to be cut.

Fig. 2



The saws are not ordinary circular saws, but annular, the blades being secured to turned wrought iron flanges insuring stiffness and perfect truth. These flanges are bolted to hollow heads, which are formed to receive two, three, or more planing bits, or cutters, that finish the joint of the stock after it passes the edge of the saw. The method of setting and securing these blades is peculiar and very effective. It is shown in detail in Fig. 2.

These hollow heads are divided into as many radial compartments as there are planing bits. The sides of these compartments have planed ledges on their sides, which hold the edges of one side of the bits. They are seen in perspective, in Fig. 1. These ledges are planed or filed perfectly smooth and straight. On the other side of the bits are wedges, A, Fig. 2, with planed surfaces meeting the back of the bit. These wedges are moved by means of screws, B, the heads of which are seated in semi-circular recesses in the head, as seen, and turned by means of a socket wrench. The edge of the bit being set at the proper distance from the inner face of the head, a slight turn of the screw brings the wedge down upon it and hugs it with great force against the ledges.

This method of securing cutters (which may be also applied to any tenoning or grooving machine) leaves a clear throat for the discharge of chips, unimpeded by bolt head or other devices, and does not neccssitate the slotting of the bit, which is simply a plain plate.

This device was patented through the Scientific American Patent Agency, May 26, 1868, by John J. Sanders, Jr., who may be addressed for the purchase of the entire right, or for other information relative to the patent, at 257 Hudson street, New York. He will also sell the right to hold planing irons, etc., by his method, to plane makers, wood workers, and others wishing to use it.

NATURAL SELECTION—THE DARWINIAN THEORY.

The theory of the origin of species as first enunciated by Darwin, and which has been so widely discussed, has undoubtedly been gaining ground among the most celebrated naturalists. The basis of that theory is, first, that variations, so slight as not to form distinctive features of classification, are constantly occurring in the reproduction of both plants and animals; second, that these variations of form are capable of transmission to progeny, and that the peculiar characteristic resulting from the variation is generally intensified in its transmission; third, that whenever the variations give their inheritors peculiar advantages in obtaining sustenance, etc., over that possessed by their fellows, they will live longer, will procreate more, and consequently, in the lapse of ages, will extinguish the weaker types. The author of the theory called this process natural selection, and supported his theory by the results of numerous experiments, in which, by artificial selection, he produced similar results to those which he claimed for the natural selection. He experimented mainly with animals which propagate very rapidly, as pigeons, rabbits, etc., and thus was enabled to produce between generations widely separated, very astonishing differences in form, color, and habits. He produced such marked changes in the descendants of wood pigeons, that he truly said, that had they been found at large by a naturalist, they would not have been classed with the same genus. They ate meat, had hooked beaks, and talons, and were both in appearance and habit similar to the family of hawks.

When this theory was first propounded, it met both vehement opposition and ridicule. It was attacked by philosophers and wits, and formed the subject of many a lampoon and satire. It was denounced as opposed to the teachings of revelation, as a system of guesses, which were not sustained by either facts or logic. But there was a vitality in the theory, and the conclusions of a man who fortifies his opinions with such a host of facts as Mr. Darwin brought to sustain his, are not easily put aside. One after another the thinkers of the entire world have slowly been accepting the theory, until it may fairly be doubted whether any hypothesis is more nearly established upon a permanent basis.

Dr. J. D. Hooker, in his recent address to the British Association at Norwich, thus reviews this subject:

"Ten years have elapsed since the publication of 'The Origin of Species by Natural Selection,' and it is hence not too early now to ask what progress that bold theory has made in scientific estimation. The most widely circulated of all the journals that give science a prominent place on their title pages, the *Athenæum*, has very recently told it to every country where the English language is read, that Mr. Darwin's theory is a thing of the past; that natural selection is rapidly declining in scientific favor; and that, as regards the above two volumes on the variations of animals and plants under domestication, they 'contain nothing more in support of origin by selection than a more detailed reasseveration of his guesses founded on the so called variations of pigeons.' Let us examine for ourselves into the truth of these inconsiderate statements.

"Since the 'Origin' appeared ten years ago, it has passed through four English editions, two American, two German, two French, several Russian, a Dutch, and an Italian; while of the work on 'Variation,' which first left the publisher's house not seven months ago, two English, a German, Russian, American, and Italian edition are already in circulation. So far from natural selection being a thing of the past, it is an accepted doctrine with every philosophical naturalist, including, it will always be understood, a considerable proportion who are not prepared to admit that it accounts for all Mr. Darwin assigns to it. Reviews on 'The Origin of Species' are still pouring in from the Continent, and Agassiz, in one of the addresses which he issued to his *collaborateurs* on their late voyage to the Amazon, directs their attention to this theory as a primary object of the expedition they were then undertaking. I need only add, that of the many eminent naturalists who have accepted it, not one has been known to abandon it; that it gains adherents steadily, and that it is, *par excellence*, an avowed favorite with the rising schools of naturalists: perhaps, indeed, too much so, for the young are apt to accept such theories as articles of faith, and the creed of the student is also too likely to become the shibboleth of the future professor. The scientific writers who have publicly rejected the theories of continuous revolution or of natural selection, or of both, take their stand on physical grounds, or metaphysical, or both. Of those who rely on the metaphysical, their arguments are usually strongly imbued with prejudice, and even odium, and, as such, are beyond the pale of scientific criticism. Having myself been a student of moral philosophy in a northern university, I entered on my scientific career full of hopes that metaphysics would prove a useful Mentor, if not quite a science. I soon, however, found that it availed me nothing, and I long ago arrived at the conclusion, so well put by Agassiz, where he says, 'We trust that the time is not distant when it will be universally understood that the battle of the evidences will have to be fought on the field of physical science and not on that of the metaphysical.' (Agassiz on the 'Contemplation of God,' in the *Kosmos. Christian Examiner*, 4th series, vol. xv. p. 2). Many of the metaphysicians' objections have been controverted by that champion of natural selection, Mr. Darwin's true knight, Alfred Wallace, in his papers on 'Protection' (*Westminster Review*) and 'Creation of Law,' etc., (*Journal of Science*, October, 1867), in which the doctrines of 'continual interference,' and the 'theories of beauty,' kindred subjects, are discussed with admirable sagacity, knowledge, and skill. But of Mr. Wallace and his many contributions to philosophical biology it is not easy to speak without enthu

sism; for, putting aside their great merits, he, throughout his writings, with a modesty as rare as I believe it to be unconscious, forgets his own unquestioned claims to the honor of having originated, independently of Mr. Darwin, the theories which he so ably defends.

"On the score of geology, the objectors rely chiefly on the assumed perfection of the geological record; and since almost all who believe in its imperfection and many of the other school, accept the theories both of evolution and natural selection, wholly or in part, there is no doubt but Mr. Darwin claims the great majority of geologists. Of these, one is in himself a host, the veteran Sir Charles Lyell, who, after having devoted whole chapters of the first editions of his 'Principles' to establishing the doctrine of special creations, abandons it in the tenth, and this, too, on the showing of a pupil; for, in the dedication of his earliest work, 'The Naturalist's Voyage,' to Sir Charles Lyell, Mr. Darwin states that the chief part of whatever merit himself or his works possess has been derived from studying the 'Principles of Geology.' I know no brighter example of heroism, of its kind, than this, of an author thus abandoning, late in life, a theory which he had for forty years regarded as the very foundation of a work which had given him the highest position attainable among scientific writers. Well may he be proud of a superstructure raised on the foundations of an insecure doctrine, when he finds that he can underpin it, substitute a new foundation, and, after all is finished, survey his edifice, not only more secure, but more harmonious in its proportions than it was before; for assuredly the biological chapters of the tenth edition of the 'Principles' are more in harmony with the doctrine of slow changes in the history of our planet than were their counterparts in the former editions."

A NEW TREATISE ON STEEL.

We are in receipt of a new treatise upon the theory, metallurgy, properties, practical working, and use of steel, translated from the French of M. H. C. Landrin, Jr., C. E., by A. A. Fesquet, Chemist and Engineer, with an appendix on the Bessemer and the Martin processes for manufacturing steel, from the report of Abram S. Hewitt, U. S. Commissioner to the Universal Exposition, Paris, 1867.

Among the many claimants to public favor, which have appeared upon this subject, we have met with none which appears to us better adapted to the universal necessities of all directly or indirectly interested in the metallurgy of steel. The mechanic will find here the information he requires, conveyed in a simple and practical form unburdened with unnecessary verbiage, and arranged in convenient form for reference and condensed without neglect of important principles. A good specimen of the work is the following extract, upon the tempering of steel. The temperatures are given in degrees of the centigrade scale. The reader can easily convert them into degrees of the Fahrenheit scale, by the following simple rule: Multiply the degrees expressing any temperature in the centigrade scale by 2. Subtract one tenth of the product from the product itself, and add 32 to the remainder. The result will be the number of degrees of the Fahrenheit scale, expressing the same temperature.

"Notwithstanding what has been said, and the so-called experience of some practical metallurgists, pure water is the best liquid for hardening steel. It is a mistake to believe, with the ancients, that certain waters are more adapted to this operation than others. The only difference lies in their temperature. A workman of Caen, Mr. Damesme, who has published a diffuse work on steel, has tried the hardening of steel in the juices of vegetables, and has ascertained that there is comparatively no advantage over hardening in water. Mercury has no other property than that of being cold, and of producing a hardness which can be obtained with water at the same temperature. Tallow and oils, where carbon is one of the constituent elements, produce an imperfect hardening, but prevent a loss of carbon. When by overheating, steel has been burned and decarburized, the oils and fatty matters are useful, because they give back to the steel a part of the carbon lost in the fire. Some acids, such as sulphuric, are justly considered as imparting more hardness to steel, by dissolving a film of iron from the surface and exposing the carbon. As for urine, alcohol, brandy, and a thousand other liquids extolled by ignorant workmen, they are not worth as much as water, which has the advantage of being abundant everywhere, cheap, and adapted to all changes of temperature.

"Steel should be hardened to the point corresponding to its nature and its use. Indeed, it is possible to correct the quality, either by increasing the hardness by a very cold dipping liquid, or by producing more elasticity when tempering; but these corrections are left too much to the judgement of the workman to be considered efficacious. For instance, in fine cutlery, and principally in the manufacture of surgical instruments, every instrument must have its peculiar hardness and tenacity. Very few men always succeed in the operation, which, generally, is left to chance.

"Hammers, cold chisels for iron, drills, engraving tools, require a strong hardening, a great hardness; sabres razors, straw cutters, etc., do not require to be dipped into very cold water; table knives, scissors, and springs, require less hardness.

"We readily understand, that if the temperature the most proper for the degree of hardness and tenacity of the instrument were known, it would be sufficient to raise the instrument to that temperature, and to immerse it afterward in water. Some workmen heat the steel which is to be hardened, much above a cherry redness, allow it to cool slowly in the air, and wait until it has taken a certain color, previous to plunging it in water. This is a very bad practice, because by an excess of heat, there is a loss of carbon, and an alteration of the steel, which has then large grains, and is without tenacity at the edges. In order to graduate the heat, and to bring the instruments to various and distinct temperatures D. Hartley, in 1789, thought of using a pyrometer, when hardening This process, very good, indeed, was difficult in practice. Sir Parkes was more successful, by determining in advance the various points of fusion and of perfect liquidity of certain metallic alloys. These temperatures being known, steel is plunged into the molten alloy, the same as into a forge fire, and when thoroughly heated, is dipped into cold water.

"Although this method has not been generally employed, for the sake of its ingenuity, we will take from the compositions of Sir Parkes, those which most nearly correspond with the various colors and temperatures necessary for certain instruments.

"The temperatures are in degrees centigrade:—

Lead.	Tin.	Temperature of fusion.
7 parts.	4 parts.	213.40°
7½ "	4 "	221.11°
8 "	4 "	225.50°
8½ "	4 "	232.22°
10 "	4 "	240.90°
14 "	4 "	251.90°
19 "	4 "	262.35°
30 "	4 "	273.90°
48 "	4 "	284.90°
50 "	4 "	289.20°

Linseed oil boils at 312.40°.
Lead melts at 319°.

"The metallic baths above named are certainly not for heating steel previous to hardening, but for tempering steel already hardened.

"Hardened steel is generally harsh and brittle; so is chilled iron, probably for the same cause. If, after a strong hardening, which will be the type of extreme hardness, steel is heated again to redness, it loses all the hardness it had gained, becomes soft, and will be rendered hard again only by a new hardening. Between these two extremes: hardness and softness, there are several degrees which are as many shades of the qualities adapted to certain uses.

"These degrees are made apparent by the color of the metal when reheated, and take place in the following order:

"1. Being put upon burning fuel, the steel gradually heated becomes tarnished, yellow, and *straw yellow*.

"2. The heat increasing, the color deepens, and reaches a gold yellow, *full yellow*.

"3 Afterward, the steel takes several shades, rapidly following and blending with each other; they are purple, pigeon's throat, copper, *brown purple*.

"4. These shades become deeper until they become *violet*.

"5. Afterward, they pass rapidly to indigo blue, *full blue, dark blue*.

"6. This color becomes weaker, and gives a *sky blue* more or less pure.

"7. The blue takes a greenish tint and produces shades which are gray and *sea-green*.

"8. At last, the steel *reddens*, and will no longer give distinct colors.

"The shades of these eight colors, which are called tempering colors, and perfectly distinct, very apparent, and easy to recognize; but they take place only after hardening and on clean steel. The metal which has not been hardened, will not show these colors so plainly; the shades are mingled, blended, and less in number.

"The colors, during the tempering, are a sure guide for the workman, of the degree of hardness or tenacity he desires to obtain. Dark blue indicates a great tenacity, straw yellow produces a greater hardness, and is the tempering shade for razors. Bistouries, lancets, penknives, erasing knives, some scissors, and generally blades requiring body, are reheated to full yellow. The strong blades for table knives and gardening tools are tempered to a brown or purple brown. Purple is the proper color for large shears. Violet and dark blue are for springs; with a violet color, the spring will be very elastic but brittle, a blue shade will make it very resisting. It is very difficult to break a spring reheated to the color of water; but its elasticity is a great deal lessened.

"The temperatures (centigrade) corresponding to these colors, and best adapted to the tempering of various instruments are seen in the following table:

Lancets	210°—215°
Other surgical instruments	220
Razors	225
Penknives, erasers	230—235
Scalpels, cold chisels for iron	240
Shears, sheep shears, gardening tools	250
Hatchets, axes, plane irons, pocket-knives	260—265
Table knives, large scissors	270—275
Swords, watch springs	285
Large springs, daggers, augers	290
Saws, some springs	310—315
Various other instruments requiring less hardening	320

"The hardened instruments are reheated in or upon a live fire, easily regulated, and without the help of bellows as far as practicable. An intelligent workman will cease blowing as soon as he perceives that the metal begins to change its color. The proper shade must come by itself without increasing the fire, and must be regular all over, before the piece is plunged in cold water. Sometimes this last dipping is omitted.

"The small pieces, such as penknives, erasing knives, etc., rest upon a wire cloth put into the middle of the fire; when they have reached the proper color they are cooled in water.

"A lancet requires a special tempering: the shank must be blue; from there the color will be first purple, next brown, and at the point, full yellow. These various shades upon one blade are a necessity, on account of the degree of hardness and tenacity required by this instrument. Full yellow will produce the proper sharpness, but would not be suitable to the rest of the blade, which, instead of hardness, must have tenacity and elasticity.

"A good workman, willing to give the greatest perfection to an instrument, will be very careful when tempering it, in order to obtain the various shades which are necessary. A knife, for instance, must be brown purple at the cutting edge, purple in the middle, and sea green at the back, to unite the hardness of the cutting edge, with a certain amount of resistance which will prevent its breaking under a strain.

"This is obtained by using certain precautions, and above all, by not going beyond the proper degeee, because it is very difficult to retrace the steps. If the fire is too strong or irregular, part of the edge may be purple brown, while the other is only straw yellow; then, by pinching the blade between red hot tongues, at the place which should be more heated, the temperature rises rapidly, and the instrument is brought up to the proper tempering point. Certain scraping and burnishing tools, and steels for sharpening, do not require any tempering, because they cannot be too hard.

"It happens though rarely, that steel bars which have been and left for some time in store rooms, will break with a noise and will project to a distance, pieces of steel from the corners. This phenomenon does not take place with small pieces, such as smooth or even bastard files, but will happen with large rubber files, mostly those of cemented steel. By hardening too quickly, the same effect is sometimes produced; the workman receives a shock in his arm at the moment of dipping: part of the piece breaks off with a noise, or the steel splits along its length."

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STEAMER FOR COMMON ROADS—VULCANIZED RUBBER TIRES.

We noticed some time ago an adaptation of rubber to wheel tires for traveling over rough and uneven surfaces. We copy the principal points of an account given in one of our Scottish exchanges—the Edinburgh *Scotsman*—of an experiment made with R. W. Thomson's patent road steamer in Edinburgh, Scotland. "It drew four loaded wagons each of which weighed, when empty, 2¾ tuns and carried a load of 5¼ tuns of coal, making the gross weight of the wagons 32 tuns. The road steamer weighs 8 tuns. Thus a total of 40 tuns was in motion. The road steamer had drawn the train from Newbattle Collieries, eight miles from Edinburgh, over a very hilly road, with rising gradients of 1 in 16. The hill from the Pow Burn up to Minto Street is both long and steep, but the road steamer drew its train to the top with the most perfect ease. It was very curious to watch the behavior of the patent india-rubber tires of the road steamer as they passed over the various descriptions of road surface. In the outskirts of the city, where the roads are macadamized, there were many places where broken stones had just been spread on the surface. Over these sharp loose stones the india-rubber tires of the road steamer passed without crushing or in fact disturbing them in the least. The roughest and sharpest bed of broken stones sank gently into the elastic cushion of india-rubber, which rose from the contact with the most jagged fragments of stone without any trace or mark of injury. The perfect command which the conductors of the train had over its movements enabled them to control both its course and speed with the utmost precision. The line of streets through which it passed—viz., Minto street, Clerk street, Nicolson street, South Bridge, North Bridge, Princes' street, Leith street, and Leith Walk—are always the most crowded streets in the city, but at the time the train passed through these thoroughfares there happened to be an unusually great current of traffic passing in a contrary direction towards the South Side Gymnasium, where some games were going on, which gave rise to a great stream of omnibuses, cabs, and conveyances of every description, in addition to a great crowd of pedestrians. Notwithstanding all these obstacles, aggravated by the streets being at some points under repair and closed for one-half of their width, no difficulty was experienced in steering clear of every impediment. The crowd of spectators increased with such rapidity that by the time the train was passing the University thousands were trying to catch a glimpse of the novel sight, and when crossing the High street the swarms of idlers who give such a busy aspect to that locality rushed in vast numbers to see how the train would descend the steep incline from the High street to the Bridge. This was done with as much ease and quietness as if there were no hill at all. The extremely curious way in which the whole four wagons follow, snake like, in the track of the road steamer was clearly seen in passing out of North Bridge into Leith street. First, the road steamer had to turn to the right, and before the last wagon was round the corner to the right, the road steamer had already turned sharp to the left to go into Leith street—thus the train actually assumed the form of the letter S, every wagon going over the same ground as the road steamer with the most perfect accuracy. The very steep and crooked descent of Leith street, which has a gradient of probably 1 in 12, was managed with perfect ease, and the train pursued its way down Leith Walk, along Junction street, and up Bonnington Road to the works of T. M. Tennant & Company, where it had to deliver the coals. In passing out of Junction street into Bonnington Road there is a sharp acute angle, so that the train had actually to double back on itself; however, it rounded the corner without the smallest difficulty. The final maneuver was one which the conductors of the train did not expect to be able

to accomplish without breaking it into two portions. It had to be taken out of the Bonnington Road, which is a narrow street of 30 feet in width, into a lane 25 feet wide, which rises with a steep incline to the entrance gate of Bowershall Works. It was determined to attempt this narrow entrance with the entire train of ninety feet long, and it passed in at the first trial, leaving so much space to spare that it was found, on afterward measuring the wheel tracks, a width of fourteen feet would have sufficed, though the breadth of the wagons is seven feet. The train curved in through the narrow entrance, mounting at the same time the steep incline leading up to the works, and drew up in the yard in perfect order.

"There can be no doubt this invention of the application of vulcanized india-rubber to the tires of road steamers forms the greatest step which has ever been made in the use of steam on common roads. It completely removes the two fatal difficulties which have hitherto barred the way to the use of traction engines—viz., the mutual destruction of the traction engine and the roads. The india-rubber tires interposing a soft and elastic cushion between the two, effectually protect them both from every jar and jolt—in fact, as much so as if the engine were traveling over a tramway of india-rubber. The road steamer, which drew the four wagons of coal from Newbattle Colliery on Saturday, was constructed to draw less than one-half of the weight comprised in the coal train. It was perhaps hardly fair to test it more than the double of its legitimate work, but it was deemed best to test it with great severity, and the great success of the trial has surpassed every expectation."

The London *Engineer* says:

"This road steamer has wheels made of a material which at the first sight does not look a very likely substance to stand the heavy work they are subjected to. The tires are made of bands of vulcanized india-rubber about 12 inches wide and 5 inches thick. Incredible as it may appear, this soft and elastic substance not only carries the great weight of the road steamer without injury, but they pass over newly broken road metal, broken flints, and all kinds of sharp things, without even leaving a mark on the india-rubber. They do not sink into the road in the least degree. They pass over the stones lying on the surface without crushing them. Those soft and elastic tires resemble in some degree the feet of an elephant. Both the camel and elephant have very large soft cushions in hard hoofs, and no other animal can stand so much walking over hard roads as they can accomplish.

"The power required to propel the road steamer is very much less than what would be required if the tires were hard and rigid. They do not crush nor sink into the roadway. The machine, as it were, floats along on the india-rubber, and all the power used in crushing and grinding the stones under rigid tires is entirely saved. It might at first sight be supposed that it would take a great deal of power to propel a heavy carriage on soft tires; but if the tires are elastic as well as soft, the power used in compressing the tire in front of the wheel is nearly all given back as the elastic tire expands behind the wheel.

"The india-rubber tires require scarcely any more power to propel them over soft bad roads, or over loose gravel roads, than on the best paved streets. The reason of this is quite obvious; they do not sink into roads, and do not grind down the stones in the least degree.

"Trials have been made at Leith by running the road steamer across a soft grass field, in which an ordinary steam carriage would certainly have sunk. The way it ran through the grass, without even leaving a track, was very remarkable; but when it made for a part of the field which had just been covered with loose earth to the depth of one or two feet, and ran straight across, and then back through the deep soft soil, the surprise of those present was great indeed. The weight of the road steamer is between four and five tuns; and yet the wheels in passing over the loose earth compressed it so little that a walking stick could easily be pushed down in the track of the wheels without any exertion. It is quite clear that one of the great difficulties farmers have had to contend with in using steam engines for ploughing is now removed, for the road steamer will run through any field, even when newly ploughed, without any difficulty. After various evolutions, showing the ability of the road steamer to run about where there were no roads, it passed out into the street, and, taking a large omnibus full of passengers in tow, it proceeded up the Bonnington road to Messrs. Gibson & Walker's mills, where it took a large wagon, weighing with its load of flour about ten tuns, up a steep lane full of holes and ruts, and rising with a gradient of 1 in 20. It was obvious that the road steamer was able to do a great deal more than it had to do in this trial. The bite on the road is something marvelous, and the easy way in which it floated along on its soft and elastic tires was very curious. When riding on the road steamer the feeling is like what would be experienced in driving over a smooth soft grass lawn. There is absolutely no jarring at all. Thus the machinery is spared the severe trials arising from the blows and jolts to which it is subjected when mounted on common wheels. There is, incredible as it may appear, no appearance of wear on the india-rubber tires. The original surface which the rubber had when it left the manufactory is still visible.

"The steamer which was the subject of the experiments had another speciality beside the wheels. It was fitted with a vertical boiler, which is one of the most economical steam generators yet produced.

"The tractive powers of the machine have surpassed all expectation. It was constructed to drag an omnibus, weighing, with its load of say thirty passengers, about four tuns, on a level road, but its powers are so greatly in excess of this task, that no load yet placed behind it has fully tested its power. An opportunity was offered which was confidently expected would show the limits of its capabilities. A huge steam boiler, weighing with its truck between twelve and thirteen tuns, had to be dragged up a hill rising 1 in 12. The little road steamer was chained to the truck, and steadily drew the great boiler to the top of the hill, the india-rubber wheels biting the ground in the most perfect manner; there was not the least sign of slipping. The boiler was drawn from the works of Messrs. Hawthorn & Co. along the Junction road, and then up the hilly Bonnington road, to the flour mills of Messrs. Gibson & Walker. In its progress the road steamer had to draw its great load over all kinds of road. Nothing seemed to effect the bite of the india-rubber tires. The road was so slippery from the frost that horses had the greatest difficulty in keeping on their legs, but no difficulty was found in going over the glazed surface with the india-rubber wheels. India-rubber does not slip even on ice, as may be easily ascertained by trying to slide in a pair of india-rubber goloshes."

The Celebrated Cashmere Shawls.

Finest of all woolen textures and most exquisite in workmanship is the Indian shawl. Uniting richness of design with freshness of coloring, it has no rival in the world. It is not only the most splendid tissue ever wrought by the hand of man, but it is also the most solid and durable, whether it adorns the shoulders of a modern belle or the waist of an Eastern potentate.

The Vale of Cashmere, where roses ever bloom, is the seat of this manufacture. The Cashmere shawl is woven by hand from the finest wool grown in Thibet. The wool is first spun and then dyed. It is then woven in segments which are afterward joined so skillfully as to leave no trace of the seam visible. The flowers are then worked in by hand, after which the shawl is cleaned and covered with a strong size, made principally of rice, when it is ready for market.

Shawls were formerly made in pairs, but since European dealers have invaded Cashmere more than two are made from the same pattern.

If destined for Europe, the shawl has to be disencumbered of its provisional dressing. For this purpose it is washed in the river flowing from the Lake of Cashmere, whose waters are reputed to preserve the colors, a property attributed to the aromatic plants growing on its banks. A sheet of paper is laid between each fold of the shawl. It is enclosed in four or five envelopes, and packed with the utmost precaution.

So delicate and complicated a work can only be accomplished by workmen versed in it from infancy, and who, living upon a handful of rice, are satisfied with moderate wages

The best workmen scarcely earn more than from three to four cents a day. The low price of labor will always render Europe tributary to Asia for this luxurious production. A shawl which costs $400 at Cashmere, or at Umritsur, in the Punjaub, where these shawls are also fabricated, could not be made for less than $5,000 to $6 500 by European workmen. The material only enters into twenty per cent of the cost. Hence many French manufacturers have formed establishments at Cashmere and Umritsur, where shawls are made by native workmen; but in too many instances they have introduced their own designs, which have changed the national character of the shawl, and often in these cases the beautiful tissue is concealed beneath a mass of embroidery.

Shawls of inferior quality are also made at Loodiana where this industry was introduced by a colony from Cashmere, recruited every year from the valley. The colors of those made at Loodiana are very solid, and bear constant washing. They are wanting in brilliancy of tints, consisting principally of brown, black, dark bottle-green, and indigo blue. The colors most prized are a dull yellow, shades of amaranth, and, most brilliant of all, a kind of rose pomegranate of the finest thread, used only in shawls of the finest quality. The favorite color in India is a bright copper green; it fades, but is very brilliant and costly, and is chiefly employed where palms are introduced into the design. Another shade of the same color is used for the warp of the finest shawls, as is also turquoise blue, a most costly color.

At Loodiana the workmen are seated three together at the same strip, in front of a cylinder upon which the warp is rolled. Each has at least fifty shuttles. The chief sits in the middle and guides the other two. In one pair of shawls is six hundred days' work; they would cost at Loodiana, if of the finest quality made, about $100. The white shawls with green palms are the coarsest.

These Loodiana shawls are heavy, the palms stiff and ungraceful, and they are destitute of the softness so admired in Europe; of this they gain in a great degree by wear and washing. From their cheapness Cashmere cannot contend with Loodiana in the Indian market. What the Indian produces by years of manual labor, the European now obtains in a short time by means of machinery. Shawls are made in the Jacquard loom by workmanship, the most intricate and complicated.

An attempt has been made to imitate these shawls in France, but the perfect softness of the Indian shawl has never yet been equaled.

Another great merit of the Indian *cachemire* consists in the harmony and effect produced from the proper distribution of color and the rich invention of their patterns; these give them an evident superiority over the French shawls, which last are chiefly distinguished by their well chosen designs and the perfect regularity of their weaving, equally apparent both in the ground and border. The Cashmere wool is the most delicate and difficult of all tissues to work, so that the Eastern natives, by their success in weaving it, have earned the reputation of being the most patient and most skillful weavers in the world.

The Effect of the Recent Earthquake upon the Waters of the Pacific.

A hypercritical editor, hailing from the city of brotherly love, says: "The illiterate press have found a new word, and pleased as a child with a new toy, are using it on all possible occasions. 'Tidal wave' is the latest lingual plaything, and inaccurate journals and journalists are flinging it about with a childish disregard of its meaning or proportions. The great earthquake of South America comes, we are told, of the tidal wave. Now, a tidal wave, as any one can see by looking into his dictionary, is a regular and periodical swell, not a volcanic or otherwise exceptional upheaving. At Cape May we use them to bathe in. The very root of 'tide' is a Saxon word signifying time. The South American convulsion was just *not* a tidal wave, and that was exactly where the trouble arose." Had this editor consulted his dictionary further, he would have discovered that the word tide has been used by good authority as meaning a strong confluence without regard to regularity of interval. This meaning, although pronounced obsolete, has nevertheless been much used by modern writers; and, in lieu of anything better, we shall continue so to use it, notwithstanding we are aware "that the schoolmaster is abroad again."

A constant attendant of earthquake shocks, the tidal wave produced by them has always been a subject of interest. The production of such a wave is easily explained. The mean level of the bottom of a body of water being suddenly changed, such a wave is an inevitable consequence. The waters rush with overwhelming force into mouths of rivers, harbors, and bays, sweeping ships and floating docks from their moorings, and often flooding whole tracts of country lying many feet above the ordinary high water mark. The recent earthquake in Peru was accompanied by a tidal wave of immense volume and extent. The entire western coast of South America, the Sandwich Islands, and Southern California, four thousand miles north of the great center of convulsion, received the force of this wave. In Peru, the wave swept into the ports with overwhelming violence, adding enormously to the ravages of the shock previously experienced. At Talachuana, on the southern coast of Chili, about six hours subsequent to the disaster in Peru, the wave swept into the bay, having traveled a distance of 1,400 miles. This town was almost entirely submerged, and great damage was done to the shipping, principally whalers.

A letter from a Mr. Hewitt, to the Los Angelos *Star*, describes the phenomenon as it appeared on the morning of the the 14th, at about seven o'clock (about fourteen hours after the occurrence of the central shock), at Wilmington, in Southern California:

"The tide was observed to be running in with unusual velocity for about fifteen minutes, and then to suddenly turn and run out for about the same length of time, with the same unexampled rapidity. It is now 9 o'clock in the evening, and the same running in and running out, at intervals of from 15 to 25 minutes for each direction, has been going on since it was first observed this morning. Captain Polhamus, of the steamer *Cricket*, informs me that in crossing the bar to-day he observed the water fall five feet in eight minutes, and to immediately rise the same number of feet in the same space of time. Another unexplainable peculiarity of this never-before-heard-of tidal freak is that the water from the sea would run upon one side of the channel, and *down* the other side at the same time."

The wave was also felt at other points along the Pacific coast, which may be inferred from what we have already said about it. The most striking peculiarity attending these waves is the rapidity with which they travel, which will leave little room for surprise at their great force and destructive energy.

Whence the Material for False Head-dresses Comes.

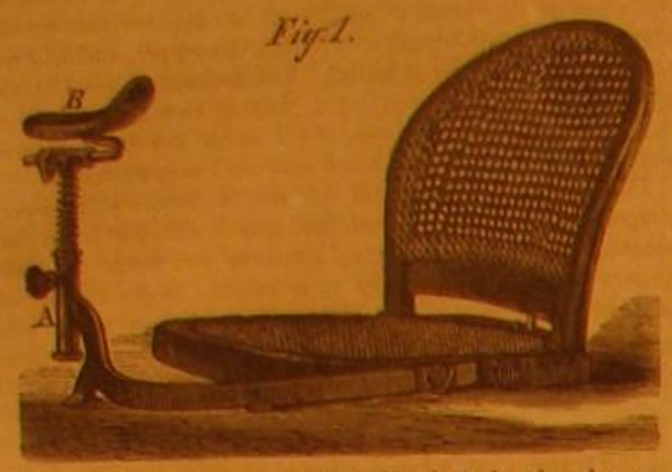
M. Pierre Véron supplies some interesting, if not in all respects satisfactory and comforting information concerning the origin of some of the head-dresses worn by the fashionable of the day. It seems that long hair is expensive, costing as much as 110f. a pound; short hair is to be had at from 18f. to 35f. One of the principal dealers in human tresses has a house in Paris, five stories high, entirely to himself, and last year he did business to the amount of 1,233,000f. The capillary *razzias* executed among the peasantry no longer suffice to meet the enormous demand; and—well, there is no use adopting a round-about way of stating the matter—the hair cut off the heads of dead persons in the hospitals comes in very useful, but still insufficient. So importations are had recourse to. Fair hair is bought from certain German provinces. Whole cargoes of black hair is received from South America, "while," says our author, "we expect immense quantities of hair made up into head-dresses to North America." The dearest hair is the completely white. It is hardly to be found long enough, and a chemist has undertaken a series of experiments to take the color out of dark hair. He has got as far as mottled gray, but the true white has yet to be discovered. We have recently seen a statement to the effect that the Comanches and Apaches—the wild, savage Indians of the northern provinces of Mexico and New Mexico—have sold scalps of their tortured and murdered victims to the agents of the hair manufacturers.

THE EARLY FROSTS.—In Scranton, Pennsylvania, the mercury fell to 31° on the morning of the 18th instant. The same date brought a frost to the vicinity of Richmond, Va., Chicago, Buffalo, Boston, Hartford, Providence, R. I., and Lewiston, Me. Ice is said to have formed at Providence R. I., and Coatesville, Pa. Snow is reported to have fallen near Montreal, and still more surprising, in Robinson and Richmond counties, Va.

NEUHAUS' TAILOR'S REST AND SEAT.

The cramped position of the legs seen in tailor's at their work and in the posture assumed by Orientals, is so far unnatural that it requires constant practice to make it tolerable; yet it is considered to be the most convenient for the work of the tailor. To relieve the constraint upon the lower limbs and afford a support for the spine in the case of tailors, the device shown in the accompanying engravings is contrived.

Fig. 1.



It is a legless chair, with seat and back, to be placed upon a bench or table; the back being hinged to the seat and made adjustable by means of a screw in the rear, so that the angle of inclination of the back may be suited to the conformation of the workman and the work to be done. In addition, there is attached to the side of the seat a bar, having at the other end a standard and socket, A, for the reception of a leg rest, or saddle, B, with its shank, which may be raised or lowered, and secured in position by means of a thumb screw. This upright shank has a horizontal socket on its upper end, in

Fig. 2

which the leg rest is adjusted. The weight of the leg is sustained by a spiral spring encircling the upright of the leg rest. The bar to which the supporting device is attached may be contracted or extended by means of a slot in the bar and a screw attached to the chair seat.

With this device there can be no cramping, and the position of the workman may be made perfectly easy and comfortable, and be changed at will. Patented through the Scientific American Patent Agency, June 2d and August 11th, 1868, by Frederic Neuhaus, who may be addressed, Box 148 Belleville, Ill.

Oriental Newspapers.

There are now lying before us two papers such as have rarely or never before lain on any other editorial table in this country, if in the world. One of them is the venerable official *Pekin Gazette*, that has been published for a thousand years, the first number of which was probably an exact counterpart of all its successors. The other is a number of a Japanese fortnightly issued on the arrival of each American steamship at Rokohama. It has been published about eighteen months, and is sold for ten cents a copy.

The Chinese paper covers ten pages, each four inches wide by ten long, and has yellow paper covers, on which are printed its name and date in black and crimson inks. It is the only native paper for a population of 414,000,000 souls, who have for centuries been in some degree of contact with European influences, and who have a literature that is vaster in its dimensions than that of any other people. It is exclusively confined to official notices. The other is one of two papers started in Japan since that empire was opened by Commodore Perry's expedition. It covers 34 pages octavo, and is illustrated. Like the Chinese the leaves are uncut, and are printed on but one side. It is called the *Newspaper of the World*. Instead of being confined to a barren record of official proceedings, it treats of agriculture, horticulture, navigation, and the building of ships; the politics and condition of other countries, literature and general news for about 40,000,000 people. It contains a cut of the European horse and dog, a small picture of a British steam gunboat, another of a somewhat similar craft, and a remarkably well executed representation covering a whole half page, of the American Pacific mail steamship Great Republic. There is also a diagram that may be geographical, or satirical, or may describe the method of cutting a carcass of mutton. The pages are not numbered. Some are covered with undivided prints. Some are divided into unequal columns by lines. Some have great blacks of matter injected into the heart of the page.

The first impression obtained from these two papers is naturally one of gratified curiosity. But there is really more meat to them. They are representatives of the condition and prospects of two empires with which we have recently come contact. The Chinese, slow and proud and conservative, have made no progress in a thousand years. The Japanese, prompt, enterprising, and anxious for improvement, begin with movable type that they have themselves cast, and employ twenty times the amount of matter used by the Chinese. —*Philadelphia North American*.

CIRCULAR FLOATING BATTERIES AND ARMORED WAR VESSELS.

The idea of constructing floating batteries of a circular form is not new, but the plan of making them offensive engines as well as defensive is quite modern. Among the plans of Napoleon the Great, for invading England, were circular floating forts propelled by sails and windmills, capable of conveying an army, respectable in numbers, with all its necessary provisions, etc. But the idea has never been tested in practical use.

We copy from the *London Artizan*, three of a series of engravings, intended to show several adaptations of the idea of circular armored vessels, proposed by Mr. John Elder, of the firm of Elder & Co., Glasgow, Scotland. One of our San Francisco, Cal., exchanges, however, copies a letter from a Mr. Rutter, who shows that some years ago he proposed a similar plan and tested it by models, copies of which, with descriptions, etc., were sent to the British Minister of Foreign Affairs at Valparaiso, to President Johnson, at Washington, and the Emperor, Napoleon III., at Paris. But whoever may be entitled to the credit of the original proposition, the plan seems to be capable of being made useful under certain circumstances. The hull of a ship built on Mr. Elder's plan, as illustrated by his models, would be somewhat similar in shape to a saucer with a flat covering, or to a small section of an orange, the rind of which would represent the skin of the vessel. Mr. Elder stated that a ship of this shape would draw only about half the water which would constitute the draft of an ordinary shaped vessel of equal displacement, though the midship section would of course be much greater. At first sight it might appear impracticable to drive a vessel so constructed through the water at any considerable speed, but

Fig. 1.

Fig. 2.

his own experience, he said, had afforded ample evidence that such a belief was erroneous. He had made two models—one of an ironclad of the most modern design, and another of a vessel built according to the plan he was advocating—and he had found, after repeated experiments in smooth and rough water, that the circular model required no more power to propel it than the other.

It was proposed for the purpose of propulsion to employ hydraulic machinery in vessels built on the circular system, similar to that used in Her Majesty's ship, *Waterwitch*—the suction pipe and water jet being in a line with each other, and it was estimated that there would be no difficulty in obtaining a speed of twelve knots an hour, if, indeed, the circular vessels would not attain to a speed commensurate with that of our fastest ironclads. The machinery for maneuvering the vessel was also very ingenious. On each side of the suc-

Fig. 3.

tion pipe and of the delivery pipe or water jet two other pipes were placed, curved at their outer ends in opposite directions, and through these the water might be taken in and given out instead of being received and delivered through the straight pipes referred to. By this means the vessel might be made to revolve in any direction, and the several guns, which were placed at frequent intervals round the vessel, could each in its turn be brought to bear on the same spot.

His method of steering is by means of a centrifugal pump, or, rather, turbine, revolving by means of a shaft, carrying at one end a pinion driving the wheel and at the other end a pinion revolving the pilot house. When the turbine revolves the pilot house is turned. By having a "look out," on line of sight, in the pilot house, corresponding with the suction pipe of the turbine, the person in the pilot house, while steering the ship, would have his back to the water jet, and would "look out" in a line with the suction. The ship would thus be caused always to travel in the corresponding direction, or, in other words, the steersman would only have to continue looking at any particular place in order to direct his vessel toward it as a destination. Double screws would seem to be applicable to the propulsion and steering of these vessels as well as the hydraulic plan of the *Waterwitch*.

From the peculiar shape of the hull, the sides forming a very acute angle with the horizon, the plating required would not be heavy. The lightness of draft is a great recommendation for its use as a movable harbor defense. The facility with which it may be turned is obvious; in fact, when required, it may be made to act as a floating revolving turret, being caused to rotate as fast as the guns can be fired. This power of rotation might also be employed when the vessel is required to act as a ram, somewhat in the fashion of a gigantic circular saw.

In the engravings, Fig. 1 represents the immersed portion, strengthened by a convex deck, the edge being above the surface, the vessel being intended for ramming as well as a powerful floating battery, the turret being pierced for a number of guns. Fig. 2 shows the battery extended nearly to the outside of the vessel with a raised pilot house in the center. Fig. 3 has the cutting edge of the vessel below the surface, but still carrying an offensive battery. Evidently this is intended mainly as a battery; for if driven through the water with sufficient speed to act as a ram its submergence, with its peculiar form, would tend to load the deck with water and diminish its buoyancy and speed. These are but a few of the modifications of form proposed by Mr. Elder; one is to have a vessel carrying a high tower in which, near the top, are mounted guns for firing over parapets, a marine adaptation of the land engines used in sieges centuries ago and employed by Titus in the reduction of Jerusalem. Mr. Rutter claims for his plan—in no essential different from Mr. Elder's—

1st. A perfect defense and protection, both of guns and men.

2d. Economy in the number of men required to work the vessel.

3d. Diminished weight of iron armor, and consequently of of relative cost to other vessels.

4th. A steady platform for the fire of guns, even in a sea way, combined with light draft of water.

5th. Impossibility of capture by boarding.

6th. Resistance offered to any attempt at destruction by rams or by running down.

7th. The small surface exposed to an enemy's fire as compared with the extent of an ordinary ship's broadside.

8th. The extraordinary capability of delivering her fire at all points of the compass at once, or of delivering a rapid and continuous succession of discharges on one point.

Petroleum Oil Test.

The general and prevailing opinion in regard to kerosene or refined petroleum oil is, that it must be of a high fire test to be safe, and to burn well; this is based on the fact that so many accidents have occurred by the use of kerosene or petroleum which have proved to be of a low fire test, and below the Government test which is considered safe.

We find by experiment that there is a certain point above which an increase of the fire test is detrimental to the burning qualities of this class of oil. All of these oils contain more or less of the paraffine or heavy oil which is not a burning oil, and the higher the test the less readily it will volatilize or feed through any of the ordinary kerosene wicks, and the more it contains of the heavy oil. This fact follows with all classes of distilled oils, from the heavy Canned and Albertine coal oil through Pennsylvania, and oil distilled from the heavy Western Virginia oil, no matter how highly purified, or at what point in distillation they are cut off, or what the color may be, there is a point below which it is not perfectly safe with the ordinary merchantable lamp, and a point above which its burning qualities are seriously injured. The point to arrive at is that which contains the least amount of paraffine that will consume with the other oil, and not wax, rosin, or burn on the wick or tube.

The color of the flame is also a guide and test; lower the fire test, white will be the light, and the light commences to shade to a yellow red till it reaches a point where the oil is so heavy with paraffine, or heavy oil, that the light or flame is dark, poor, and inferior. This important point, after careful tests and observations, we have established at 14° above the Government test, and 24° above what is considered safe merchantable oil, and between 110° Government test and 134° to 140° and to be 122° to 124° Fah. standard oil.

For all ordinary uses a lower test is considered perfectly safe and in general use.

We copy the above useful information from F. S. Pease's Oil Circular, which can be obtained by addressing him at Buffalo, N. Y.

Heavy Locomotives.

Engineering says: There are good reasons for believing that as soon as steel rails shall have been generally substituted for iron, thereby permitting of weights of from seven to nine tuns per engine wheel, a much more powerful class of locomotives will be in request. The economy of working the heaviest goods trains is now well understood, and it is only the want of strength in the permanent way that limits the weight and power of six coupled engines to the existing standard. It would afford a good exercise to many young engineers to set about designing six-coupled engines of a weight of 50 tuns or thereabouts and having this weight equally distributed. The cylinders would require to be from 20 to 21 inches in diameter, for 2 feet stroke and 5 feet wheels, and the boiler should not have less than 1800 square feet of surface, and 30 square feet of fire grate.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

For the Scientific American.

GAS EXPLOSIONS---THE SAFETY LAMP.

The Southbridge (Mass.) *Journal*, gives an account of the explosion of a gasometer, or rather gas holder, which occurred a few weeks ago at the gas works of the Hamilton Woolen Company at New Village, by which five lives were lost, which seems to furnish an opportunity for a few remarks on the subject of gas explosions, that may be useful. We copy the report of the disaster:

"No gas had been made since last spring, and there was but a small quantity on hand. The manhole in the top of the gasometer had been open five days to allow this to escape. Repairs were being made, under the superintendence of Mr. White, master machinist for the Hamilton Woolen Company, and all Saturday he was engaged with a force of men pumping the water out of the tank. During the progress of the work, he was frequently reminded of the danger from igniting the gas, and on one occasion when he suggested that a light might be used, the superintendent of the mill expressed himself plainly in regard to its impropriety. The work was not quite finished Saturday afternoon, and being desirous to begin the work of repairing on Monday, Mr. White had his employés come back after tea. The work went on till half-past eight o'clock in the evening, when, without any warning to the half dozen people who were in the building which covered the gasometer, he took a lighted lantern and lowered it by a cord into the pit, apparently to examine its condition, when the explosion occurred with considerable force, blowing the house and gasometer some twenty feet into the air, and shrouding the whole in a sheet of fierce flame. Mr. White, who was directly over the manhole, was thrown upward with much violence against the roof, crushing in the top of his head, and then fell with the burning mass into the pit or tank of the gasometer, where the fire raged with the most violence. Those who were inside the building when it rose in the air, were blown literally out of the building, followed by a terrific rush of flame. John Brown and James Brogan fell near the building. Brogan was terribly burned and lived but a little while after being taken out of the ruins. Brown had his head, side, and arms, terribly burned and crushed, and died after about three hours of suffering. Rochelle was severely burned and died the following Wednesday. Devoy, the last victim, died Thursday. Clemence and Holmes fell still further from the building, near the bank of the river, retaining their senses, and as soon as they felt the rush of flame, they jumped into the water, and thus saved their lives."

It is to be regretted we do not have a more particular account of this catastrophe; it would be well to know the capacity and form of the gas holder, and the point where the manhole was located. The usual shape of gas holders is cylindrical with a crowning top or roof, the manhole being generally near the perpendicular wall for convenience of introducing a ladder and leaning its top against the wall. The frame of the roof or crown is usually of iron bars, to which are riveted the plates of sheet iron of which the gas holder is built. In this case the manhole had been left open five days to allow the gas to escape, although, as no gas had been made for several months, the holder could not have been very heavily charged. Yet there was gas enough in it, notwithstanding these facts, to blow a building to pieces, kill five men, and start a destructive fire.

We think the cause of this accident—if so it may be termed—perfectly plain to be seen. Gas is lighter than air, and will seek the highest point. Assuming (which was probably the case) that the manhole was near the outer edge of the roof, and below the highest part of the holder, its being open five days, or five months, would not free the holder of that portion held in the upper part; the gas could no more run down to the manhole than water can run up hill. If there were no lesks in the higher parts of the roof, the gas would have been retained there in its integrity for years. There was gas—hydrogen—mixed with sufficient quantity of atmospheric air—oxygen—to constitute a highly explosive mixture, requiring only a flame to ignite, and that was supplied by the lantern. Consequence, a terrific explosion.

Now, what should Mr. White have done in this case? He might have detected the presence of gas in the crown of the holder by punching a small hole at the apex, and applying a lighted match over the hole. If hydrogen was there it would have escaped, and that portion escaping would have ignited as it mixed with the atmosphere; only the lower stratum in the holder could have been explosive. Or, the puncture would have been sufficient to permit the gas to escape. Perhaps several small holes would have been necessary to insure perfect safety, as the ribs of the roof, if meeting the sheet iron covering air tight, might form compartments, each being an independent gas holder. We would here suggest the formation of minute passages between these compartments in building gas holders, by simply cutting scores across the bars, next the sheet covering, and forming a safety hole with suitable covering, to be removed as occasion may require, located at the very top of the crown. Thus the holder could be readily and entirely discharged of its gas.

The Davy lamp is also useful at gas works, as well as in mines, and it is so cheap and easily constructed that it is matter of wonder it is not more generally used. To enable our readers to construct one for temporary purposes, we have engraved two illustrations; one, Fig. 1, of the original Davy lamp, and the other, Fig. 2, of the Struve lamp, considered preferable to the Davy, and easier made. No description is necessary to enable the reader to understand their construction. The lamp, gauze cylinder, and all, should be about 9 inches high, 3 inches diameter at the base, and 1½ inches at the top. The sides and top should be formed of wire gauze, 700 or 800 meshes to the square inch. The edges of the cylinder must be soldered securely together along the side. At the bottom a band of sheet metal should be soldered, which should meet the body of the lamp, and be made so as to be removed for lighting and trimming, and held securely in place when in use.

Fig. 1.

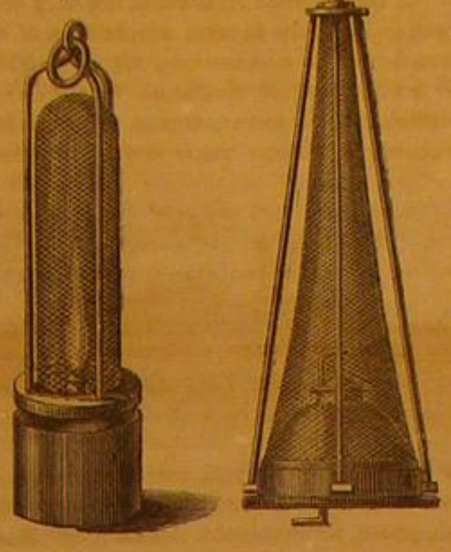


Fig. 2.

It frequently happens that in buildings furnished with gas, the pipes, stop-cocks, or meter leak. The escaping gas, mixing with the air, becomes explosive, and if confined in a room a lighted match or lamp produces an explosion destructive to life and property. When gas is found in an apartment the doors and windows should be opened, the latter from the top if possible, but if not made to let down, defend the hand with a hat or any other covering and become a glass breaker, smashing out a few of the upper panes. Allow half an hour to elapse, then bring in an uncovered light, *carrying it near the floor*, and do not approach the source of the leak with it. The Davy or Struve lamp, however, is the safest.

Fortunately these explosions are not very frequent. Yet sometimes men, who ought to know better, commit the most egregrious mistakes. As an instance, a civil engineer in Boston, some years since, found the basement of his house filled with gas, and carrying a lighted lamp above his head, and accompanied by his wife, he approached the meter, when an explosion took place that broke his legs, burned him and his wife, and cracked the walls of his house. Another case was that of a graduate of West Point, who was superintending some work on a gas holder which had been found defective. The manhole in this case was near the side wall; and to see the interior he introduced a lighted match, when an explosion occurred that severely injured him and others, and did great damage to buildings in the immediate vicinity.

New York city. F. W. BACON.

Pressure on Steam Valves.

MESSRS. EDITORS:—In your issue of September 9th, in answer to a correspondent, you say, "The pressure upon a closely fitted steam valve, not covering any ports, is as the area of the valve and the pressure of the steam." As this statement is calculated to mislead many youthful engineers and mechanics, I would state that the friction of one smooth surface moving upon another, is no greater under any pressure of steam, no matter how great, than in a vacuum, or in the open air; and it appears singular to me that the reason for the phenomenon in question, if it be a phenomenon, should have been so generally overlooked, for it is evident, beyond the possibility of a doubt, that the action of steam and that of air must be identical with respect to their penetration between two apparently smooth surfaces; for mathematically speaking, there cannot perhaps be such a thing as a smooth surface of measurable extent. It therefore naturally follows that the steam insinuates itself between the two surfaces, and it will then press upward with precisely the same force that it presses downward.

The fact that steam insinuates itself between the piston packing and the bore of the cylinder, even when both are in perfect order, and condenses in the interstices often sufficiently for all purposes of lubrication, is one among many proofs of the penetrating powers of steam.

If the above statement is not considered satisfactory to your correspondent, I would recommend him to take a slide valve of the ordinary pattern, and having scraped it to a good bearing, place it on a well fitted seat (without ports) inclosed in a chest, and apply steam of any pressure, say one hundred and fifty pounds to the square inch, and he will be convinced as others have been.

Knowing that your journal has a large circulation among mechanics, and that you would not willingly propagate an error, must be my excuse for trespassing on your valuable space. H. M.

[Our correspondent evidently does not mean the same thing by a closely fitted steam valve that we do. We mean by a closely fitted steam valve, one that is steam tight. Our correspondent seems to think that this is impossible. That such perfection is not often reached is, perhaps, true; but that it can be, and is obtained, is the opinion of some of our best engineers. Whether it ever is attained or not, the only basis for computation of the pressure a valve sustains is to assume that it is perfectly steam tight, as no one would pretend that it would be held to its seat if it lay, not upon the seat, but upon a stratum of steam.—EDS.

Coating Brass with Copper---Blowing Hot and Cold.

MESSRS. EDITORS:—Take a piece of brass, dip it in a solution of sulphate of copper, no deposit of copper will cover the brass, as the brass has no affinity for the copper, and will not separate it from the solution. But as soon as you dip the brass in the solution, you lay a piece of saw blade (steel) on it, a beautiful coating of copper will cover the brass, iron, or any other kind of steel will not produce the same results.

The extremes of heat and cold can be produced in a very simple manner. If you open your mouth wide and blow your breath, it is warm—producing heat—as you warm your cold fingers in this way. Pucker your mouth—make a small orifice—force out the breath, and it is cold—producing cold. You cool your fingers by this method when you burn them. Please explain the above phenomena, and oblige,

T. W. B.

Covington, Ky.

[The reason that, when a piece of steel is placed in contact with the brass, in a solution of sulphate of copper, the copper solution is decomposed, and its copper deposited upon the brass, is that the chemical action of the solution upon the steel renders it electro-positive, while the brass is rendered electro-negative. The copper in the solution being the electro-positive element, will be attracted to the negative pole. We think our correspondent is in error about any particular kind of steel being necessary, and that his statement to that effect is based upon defects in his method of experimenting, which of course we can not point out without personal observation.

The explanation of the second statement in his communication is, that heat and cold are merely relative terms. If he should blow upon a piece of iron colder than his breath, it would be warmed; and if the same thing should be done to a piece of iron heated to a temperature above that of the breath, it would be cooled. The sensation of cold is felt in any part of the body when it has less heat than the general temperature. The breath which is heated to a temperature nearly or quite as high as the vital parts of the body, will of course impart its heat to the extremities when they are cold. When a part of the body is burned, its heat is raised by inflamatory action above the general normal temperature. The breath would then feel cool when blown upon the burn.

When the breath is forced in a sharp current, it carries with it much of the cooler air which surrounds it, becoming intermixed with it by friction. When it is gently blown from the mouth, this effect is not produced. Try the experiment by blowing the air gently, with your mouth "puckered," and then without changing the position of the lips, blow forcibly; you will, when blowing gently, experience a feeling of heat, and when you blow forcibly, a sensation of cold will be produced, so you will see the shape or the size of the orifice has nothing to do with it.—EDS.

Flux for Blowpipe Analysis.

MESSRS. EDITORS:—Among the various methods of testing the presence of substances in chemical examinations, that by means of colored flames seems to be of growing importance, not alone with reference to the application of the spectroscope, but in the ordinary use of the blowpipe or gas flame. For unmasking lithia, etc, the books prescribe a mixture of bi-sulphate of potash and fluor spar; but this flux is objectionable, on account of the intense violet tint (potash) which may disguise the reaction due to the presence of small quantities of other substances. Fresenius directs that silicates be mixed with sulphate of lime; but this salt is, by itself, infusible, and its power of decomposing the natural silicates small. On the other hand, a mixture of sulphate of lime and fluor spar, in equivalent preparations (say about two parts of crystallized selenite to one of fluor spar finely mixed), forms an easily fusible bead, which by itself gives only a very faint dull red tint (lime) to the flame, but which renders the presence of such elements as give color, most beautifully evident and characteristic.

Thus, small portions of lepidolite, petalite, etc., mixed with this flux, impart the fine carmine tint; copper, strontium, their well known colors, especially after continued blowing. Potash and soda minerals (feldspar and albite) are at once distinguished.

Presuming that many of your readers are interested in Determinative Mineralogy, I invite them to make use of the above named reagent, and if possible extend its utility.

Lynn, Mass. STEPHEN D. POOLE.

[We have no doubt the flux described by our correspondent will prove a good one, and recommend its trial.—EDS.

Burying Alive.

MESSRS. EDITORS:—In your issue of Sept. 16th there is an article on "Burying Alive;" and in the list of patents from time to time appear devices and compounds for preserving the remains of deceased persons; and particularly I noticed last week a patented coffin which, in the language of the specification, is "rendered air tight," etc.

In regard to the "burying alive" detecter, experimented upon in Newark, N. J., there is manifested a want of practical knowledge with regard to signs of death, and of the real cases that have taken place in the experience of cemetery life. The writer of this article has seen at least fifty thousand interments made in one of the large cemeteries on Long Island, but never witnessed any want of this invention,

though I have known cases of watching the receiving vault, and leaving the coffin open, etc., in many instances. I have also seen an instance that would have startled the watchman had he fastened wires, as at Munich, to the hands and feet; for I have known the limb of a crooked-kneed person, deceased, whose remains were crowded to fit the coffin at the knee, to be drawn up by the contraction of the muscles, so as to force the lid of the coffin and hang out at the side. As regards the prejudice and strange stories about being buried alive, and evidences deduced from the fact of remains found with face downward, etc., there is great talk, with little facts. But I have seen a caving in of a grave, or a slipping off of one of the ropes when lowering into the grave, cause the complete turning upside down of the coffin, which would no doubt change the position of the corpse. An incident like this would be forgotten when, years after, the body might be exhumed. Another point about this "burying alive" detector. "A tube at the head" connects the corpse with the surface above! Indeed! Let the practical(?) inventor of this "detecter" go to Greenwood. Imagine "a tube" from the remains of every corpse to the surface above, and this ridiculous impracticable device will appear in the shape of vent holes for the unpleasant gases arising from the decaying bodies below, or, in fact, preventing the need of burying at all!

Another point about patent coffins, etc. If these inventors will go to any large cemetery and witness the styles of coffins used, they will seldom, if ever, of late, see a "metallic case"—a patented coffin, once very popular, but now in the shade. It is used for disinterment now and then, but out of a thousand interments not more than one of two cases of metallic will be seen. And yet inventors are making air-tight coffins in different ways, and all will fail, for the same reason as the metallic case. I wonder often if these inventors, or people generally, know the effect a metallic case has upon a corpse. Do they know that in a short time decomposition is so active that the generated gases and fluids, if not allowed to escape, will aid this decomposition? I have seen the remains of a noted lady that were removed from Chicago to Long Island, so decomposed that they would actually flow, jelly-like, from one end to the other of the case! Will any one dispute that this fluid aided decomposition? Being air tight, the case holds that which rots the flesh and bones. Plain facts and plain language.

Let me close by remarking that the pine box, which undertakers urge more for an item to make profit on than for utility, is also an error that the public generally are not aware of. I care not for theories of decomposition and preservation, I speak from experience in seeing thousands buried and taken up. The pine boxes, from moisture without and within, soon become tight. They retain the decomposed matter oozing from the coffin, and this soon rots the wood of the coffin, and, instead of preserving the coffin, acts to the contrary.

A common pine coffin, with loose joints, or small apertures above for gases and below for fluids, is better than all your patents.

N. F. Palmer,
Superintendent of Cedar Lawn Cemetery,
Late of Cypress Hills, L. I.

Paterson, N. J.

Nitro-Glycerin and Boiler Explosions.

Messrs. Editors:—I inclose a communication to our daily paper as an explanation of the cause of our many frightful explosions. I am an old, western, high pressure engineer, and the causes of nearly all, if not all, the boiler explosions I have always thought to be low water, over pressure, and carelessness on the part of the engineer. I have carried over pressure of steam on a set of boilers for months at a time, but with always plenty of water, and exercised careful watching, never relying on the water and steam gage alone, but always using the safety valve and gage cocks, the same as though the water and steam gage were not attached, yet never met with any boiler accident; although in two instances the same set of boilers exploded under the care of other engineers. Was it carelessness, or was it from this agent "Phosphorus" speaks of. For my part I have always adhered to your idea of explosions, and shall continue to do so until some better reason for them is given than that of the inclosed.

Geo. Whipple.

Burlington, Iowa.

[We give the communication to which our correspondent refers as a curiosity.]

NITRO-GLYCERIN CONSIDERED AS A CAUSE OF STEAM BOILER EXPLOSIONS.

1st. Water containing animal fats or oils, subjected to a high pressure of steam, the fats or oils act chemically on the steam, forming fatty acids and glycerin.

2d. Organic matter present in water used for steam, the chemical affinities will set free electricity, which generates ammonia NH_3, ammonia mixed with moist air at a temperature 212° F. over water containing potash, produces the nitrate of potash, KO,NO_5.

3d. Glycerin and nitric acid, readily combine chemically, the glycerin gives up a portion of its hydrogen and takes on a part of the oxygen, when they all combine into a new compound, nitro-glycerin, which has two and one-half times the specific gravity of water.

Nobel's blasting oil is composed of glycerin, sulphuric acid, and the nitrate of potash.

4th. Nitro-glycerin being insoluble in water, and having a greater specific gravity, it readily finds the bottom of the boiler, where it would remain were it not for the sudden rise of temperature. It is not explosive at 212° Fah., but at 500 Fah. (which it soon attains in contact with the boiler plate), explodes with thirteen times the force of gunpowder. Hence those terrific and unaccountable explosions that so often take place under the eye and care of our best engineers, when the boiler contains its maximum of water, and frequently at a low or medium gage of steam.

5th. Now when we take into consideration that at least ninety per cent. of all those terrific and heart-rending marine disasters on our western rivers for the past thirty years, commencing with the ill-fated steamer *Moselle* in 1838, and ending with the *Harry Dean* and *Magnolia*, in 1863, have occurred in the spring of the year when the rivers were full of surface water containing organic matter, fats or oils, potash, and sulphur; or that they blew up at or near the levee of some city, where they had taken on a supply of water contaminated with sewerage, containing the very elements of destruction; we are led to the logical and scientific conclusion that here is the cause of these terrific and unaccountable explosions. That under certain circumstances all the elements for the production of this compound may get into a steam boiler, and that 212° Fah. is favorable to chemical action, even to the formation and deposit of a solid stone upon the inside of a boiler no one can deny.

Phosphorus.

[We have no disposition to treat this hypothesis seriously; we would only suggest that "Phosphorus" need not have imagined impossibilities to arrive at his nitro-glycerin theory, as gunpowder would have answered his purpose quite as well. Gunpowder is composed of carbon, sulphur, and niter. All waters contain more or less organic matters, held mechanically suspended or in solution, and these are partly composed of carbonaceous substances and potash. Here we have two ingredients for our gunpowder—the charcoal and niter—and the decay or decomposition of these organic substances, continually going on, will furnish sulphurreted hydrogen gas which contains the only other ingredient required. As to the relative proportions, we cannot see why they cannot accidentally combine to form gunpowder as our "Phosphorus" elements can to form nitro-glycerin. "Phosphorus" is highly inflammable when exposed to the air. It should be kept tightly bottled; and we would suggest that if this writer intends to construct these explosive theories on any extended scale he had better imitate the substance whose name he wears and not air his ideas too freely.—Eds.

Manufacture of Pins.

A correspondent of the New York *Evening Post*, gives the following graphic account of the manufacture of pins as it is now conducted:

The pin machine is one of the closest approaches that mechanics have made to the dexterity of the human hand. A small machine, about the size of a ladies' sewing machine, only stronger stands before you. On the back side a light belt descends from the long shaft at the ceiling that drives all the machines, ranged in rows on the floor. On the left side of our machine hangs on a peg a small reel of wire, that has been straightened by running through a compound system of small rollers.

This wire descends and the end of it enters the machine. This is the food consumed by this snappish, voracious little dwarf. He pulls it in and bites it off by inches, incessantly, one hundred and forty bites to the minute. Just as he seizes each bite a saucy little hammer, with a concave face, hits the end of the wire three taps and "upsets" it to a head, while he gripes it in a counter-sunk hole, between his teeth. With an outward thrust of his tongue he then lays the pin sidewise in a little groove across the rim of a small wheel that slowly revolves just under his nose. By the external pressure of a stationary hoop these pins roll in their places, as they are carried under two series of small files, three in each. These files grow finer toward the end of the series. They lie at a slight inclination on the points of the pins, and by a series of cams, levers, and springs are made to play "like lightning." Thus, the pins are pointed and dropped in a little shower into a box. Twenty-eight pounds of pins is a day's work for one of these jerking little automatons. Forty machines on this floor make five hundred and sixty pounds of pins daily. These are then polished. Two very intelligent machines reject every crooked pin, even the slightest irregularity of form being detected.

Another automaton assorts half a dozen lengths in as many different boxes, all at once and unerringly, when a careless operator has mixed the contents of boxes form various machines. Lastly, a perfect genius of a machine hangs the pins by the head in an inclined platform through as many "slots" as there are pins in a row on the papers. These slots converge into the exact space spanning the length of a row. Under them runs the strip of pin paper. A hand-like part of the machine catches one pin from each of the slots as it falls, and by one movement sticks them all through two corrugated ridges in the paper, from which they are to be picked by taper fingers in boudoirs, and all sorts of human fingers in all sorts of human circumstances. Thus you have its genesis;

"Tall and slender, straight and thin,
Pretty, little, useful pin."

A beautiful Yankee trick was once exposed by these modern Yankee pins. A not over-scrupulous antiquarian was displaying the relics of the "Salem Witchcraft" to a wondering throng at a shilling a head. Among the relics was a saucer full, more or less, of pins taken from arms, stomachs, etc., of the bewitched victims. This was a chance for one of the astonished, who was a pinmaker. He gave a close squint at the pins, and opened his eyes very wide. "Do you say that these pins were taken from the unfortunate victims of witchcraft at Salem?" solemnly inquired the pin-man. "Of course they were; what do you ask that question for?" responded the showman. "Because I find one little obstacle to my faith in your story," rejoined the pin-man. "Solid-headed pins were not invented until two hundred years after the Salem witchcraft!" Moral—Showmen of relics should consult antiquarians and experts when "getting up" their stock.

Quicksilver Mines.

Quicksilver exists in quantities worthy of note only in Spain, California, and Peru. For a very long period the Almaden quicksilver mine in Spain was the only one known, and held a rigid monopoly of the trade. The discoveries in Peru opened a new field; but though it reduced the price for a time, it did not seriously affect it. The discovery in California threw such a quantity into the market that the whole quicksilver trade of the world is now ruled by it.

The great mine is at New Almaden, sixty miles south from San Francisco. The ore is taken from a mine in the hills the inside of the coast range of mountains, and is found in chambers instead of veins. The earthquake in October, 1865, which did so much damage to San Francisco, put money in the pockets of the New Almaden owners, as it opened up a new and very rich chamber not previously discovered. The cinnabar ore, from which the quicksilver is taken, is about the color of a well burned brick and looks, when piled up for use, much like a heap of broken and antiquated bricks. The ore is placed in furnaces, a wood fire is built beneath, and the quicksilver flies off in vapor, and is caught and condensed in air-tight rooms filled with water. After condensation it is bottled up in flasks containing seventy-six and a half pounds each, this being the same as the weight used at the Almaden mine in Spain.

This mine has been the subject of much litigation, as indeed has nearly everything valuable in California. It became the property of a stock company, under the management of Mr. Butterworth, of New York. The product in 1865 was 47,194 flasks, worth about $50 per flask, or a total value of $2,359 700. The cost of producing this result was about $800,000, leaving a very fair margin of profit. The ore averages from twelve to eighteen per cent of quicksilver, and frequently exceeds the latter figure. The ore is a deep red color, heavy like a lump of lead, and is said to contain about twenty per cent of quicksilver. A large quantity of quicksilver is used in gold and silver mining on that coast, and the balance goes to various parts of the world. Of the production of 1865, fourteen thousand flasks were sent to China, ten thousand to London, five thousand to Peru, two thousand to Chili, seven thousand to New York, two thousand to Mexico and two hundred to Australia.—*Boston Commercial Bulletin.*

Local Anesthesia.

We have always had our doubts that the local anesthesia produced by the spray of ether, was attributable to the partial or entire freezing of the parts to which it is applied as has been claimed. The *Medical Gazette* contains the following report of case in which ether was thus applied, which confirms our doubts:

"The subject of the experiment, a patient of Dr. Geo. H. Perine of this city, had some sixteen teeth extracted with scarcely any pain, and what little discomfort there was, he referred rather to the gum than to the dental nerves. Richardson's spray instrument was used, and the jet directed upon the external orifice of the ear and a little in front of it for between three and four minutes. One side was anesthetized first and a number of teeth and stumps on that side (upper and lower) extracted, and the same process repeated afterward on the opposite side. The central incisor of the side first operated on caused some pain, partly, perhaps, from subsidence of the anæsthetic action (that being the last tooth removed on that side), partly, possibly, from some inosculation of the terminal branches of the superior maxillary nerve of the opposite, undeadened side.

"Many physiologists hold that the anesthesia produced by the spray instrument is due, not to any specific effect of the agent employed, but simply to a "freezing process," the result of rapid evaporation. In this case, however, even the integument (though greatly reduced in temperature) was not *frozen*, and had it been, it would have been impossible for the mere action of cold to penetrate to the ganglion of Casser. The subcutaneous cellular tissue, fat (the worst possible conductor) muscular and fibrous layers, must surely protect the ganglion from very intense refrigeration, and, moreover, the insensibility of the dental nerves continued for some minutes after the skin had recovered its warmth at the spot where the spray had been applied.

"Dr. Perine has since used this process for the extraction of two or three other teeth, with very satisfactory results, and in one case of severe facial neuralgia succeeded by its means in giving instant (and strange to say, more than temporary) relief."

An Interesting Experiment.

Galignani says: "M. Trèves has made the following curious mechanical experiment: Two steel tuning forks brought to the same pitch were topped with small mirrors, and placed opposite to each other in two vertical planes at right angles. One of them, No. 1, was, moreover, surrounded with a strong coil of wire receiving an electric current from a nitric acid pile composed of four elements. A fiddlestick being now drawn across each of the tuning forks, the vibrations commenced, and immediately a perfectly motionless luminous circle was produced in the mirror of No. 2. But no sooner was No. 1 magnetized by the admission of the current, than the circle became an ellipse, and swayed to and fro, denoting the action of a new vibratory motion. As soon as the current ceased the figure became a fixed circle again. This experiment may serve to investigate the vibratory powers of iron and steel according to their composition and physical state."

Water Power of Maine.—The State of Maine has issued a report, entitled "The Water Power of Maine," in which detailed information is given respecting the location, characteristics, improvements, ownership, and other features of a considerable proportion of over 2,000 different water powers, representing in the aggregate from 300,000 to 600,000 horse power. It also recapitulates, in a brief manner, in a "Preliminary statement," the peculiarly favorable conditions, secured both by nature and by the liberal policy of the State, under which the water power can be employed. A copy of the Report will be sent, free of cost, to manufacturers and the employers of mechanical power, also to public libraries, upon application to Walter Wells, Superintendent Hydrographic Publication, Portland, Maine

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The Pennsylvania oil wells turned out 12,235 barrels a day last month.

The Troy foundries are running at full blast, the demand for stoves being ahead of the supply.

It takes twelve thousand tuns of coal to supply the furnaces of the glass factories on the line of the West Jersey Railroad.

The rolling mills at Portland are manufacturing fifteen hundred tuns of rails for the Grand Trunk Railway.

The Washington Mill Company at Lawrence, Mass., is erecting a new mill for the manufacture of worsted goods. It will be two hundred feet long, seventy-five feet wide, and three stories high.

A train on the Wisconsin Division of the Chicago and Northwestern Railway, is reported to have recently run fifty-one miles in forty-nine minutes, and ninety-one miles in ninety-five minutes.

Over a million pounds of tobacco, on which the owners are unable to pay the taxes, are now stored in Richmond.

Flouring mills in Minneapolis and St. Anthony will turn out 180,000 barrels of flour in the next two months.

It is said that the New England Express Company will soon begin operations on the lines of the principal railways of the Northern States.

Philadelphia does a great business in the marble manufacture. It has sixty marble yards. The manufacturers employ a large number of sculptors and carvers, and the business is very active.

Both bituminous and anthracite coal have been found in the Rocky Mountains, on the line of the Pacific Railroad, close to the track. The best coal field is near Benton, in the vicinity of the crossing of the North Platte.

The mail agents on the Union Pacific Railroad have been armed with Spencer carabines, with which to protect themselves against the attacks of Indians upon the mail trains, which it is feared they may make.

It is said that fifteen bids for the completion of the Hoosac Tunnel were received by the Executive Council. The lowest was $4,270,000. The parties making the bid were required to furnish securities amounting to $500,000 which being too large to meet their views. The matter remains in abeyance.

An explosion occurred on the 22d ult., in Richards & Verplanck's oil refinery in Jersey City, by which two men were killed and two seriously injured. Twenty thousand dollars worth of oil was burned.

The Chollar Potosi mine, Nevada, has made its annual report for the fiscal year, ending May 31st, 1868. Amount of ore extracted from the mine 70,339½ tuns. The total quantity of ore milled was 77,954½ tuns. Average yield per tun, $24 14; cost of milling, $14 75; actual cost of extracting per tun, $4 24; filling mine and dead work per tun, extracted 33½c.; taxes per tun 21½c; expenses at new works per tun, $1 87; incidentals per tun, 26c. Total expenses, $21 68. Net yield per tun, $2 46.

At the works of the Mansfield Elastic Frog Company, Hartford, can now be seen a series of railroad frogs joined together so as to form one huge diamond forty feet in length, and costing three thousand dollars. It is designed for the double track crossing of the Boston and Albany railroads near Boston, and is said to be the largest piece of this kind of work ever attempted.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

ROSSING MACHINE.—C. Gilpin and L. T. Dickinson, Cumberland, Md.—The object of this invention is to construct a simple and effective machine which shall ross the bark more thoroughly than has heretofore been done.

ROSSING MACHINE.—C. Gilpin and L. T. Dickinson, Cumberland, Md.—This improvement consists in the employment of a reciprocating saw, instead of a cutting blade, to split the bark as it comes from the rollers.

COFFEE ROASTER.—J. E. Edmundson, Bartlett, Ohio.—The object of this invention is to produce a neat and convenient instrument for household use, for the purpose of roasting coffee expeditiously and uniformly, and without diffusing its aroma, and thereby impairing its strength.

CULTIVATOR.—M. F. Lowth and T. J. Howe, Owatonna, Minn.—This invention has for its object the fastening of the cultivator tooth to the beam in such a manner that, while it remains firmly in position under any ordinary strain, it will yield when in contact with an immovable oostacle without breaking.

GLASS LIGHTS.—Wm. A. Demuth, New York city.—The object of this invention is to construct a beautiful and cheap glass light for windows, lanterns, and other purposes, which shall be more ornamental and less expensive than plate glass, and which shall be less liable to damage by fracture than any other glass lights now in use.

RUSTIC BLIND SLAT PLANE.—R. E. Lowe, Upper Alton, Ill.—The object of this invention is to construct a simple and easily adjustable instrument by which the slats, of which rustic window blinds are made can be cut out from the wood in an easy and expeditious manner. The instrument is so improved that the slats can be cut of different widths and thicknesses, while, if the plane becomes dull, it can be made to present a sharp edge again in a moment of time, without the necessity of removing it to the ground or sharpened.

MAN POWER MACHINE.—Jacob G. Deshler, Allentown, Pa.—The object of this invention is to furnish a simple and effective machine for transmitting man power with the least fatigue to the operator. It consists of a vibratory foot board, in combination with a crank shaft, and a pair of double pitmen connecting the cranks of the crank shaft.

NEST BOX FOR HENS.—B. F. Hayward, Nebraska city, Nebraska.—The object of this invention is to provide a nest box which will close automatically when the hen gets upon her nest, and will open in the same manner when the fowl wishes to leave her nest, whereby a setting hen may be protected from annoyance from other fowls or other animals prone to annoy hens while hatching or laying.

BEEHIVE.—V. Zimmerman, Morris, Ill.—This invention relates to a new and improved beehive, and it consists in a novel arrangement of hanging or suspending the comb frames, the employment of a slotted partition board, a novel moth trap, and adjustable slides.

BEE HOUSE.—James Tallman, Clayton, Ill.—This invention relates to a new and useful improvement in a bee house, or hive, and which is termed the "community hive."

LAMP.—J. P. McGee, Trenton, Tenn.—This invention relates to the method of fastening the burner to the lamp, whereby the use of a screw is avoided, and the process of attaching and detaching the burner is greatly facilitated.

MACHINE FOR MOLDING CANDY.—E. K. Powers, Grand Rapids, Mich.—This invention relates to a new and improved machine for molding candy, and is more especially designed for molding pop-corn candy. The invention consists of an improved means for forming the candy into proper sized sticks, and then compressing the same.

CONCRETE BLOCK PRESS.—O. V. Evans, Ripley, Ohio.—This invention relates to improvements in presses for making concrete blocks, whereby it is designed to provide a simple and effective machine for accomplishing the same, and it consists in the arrangement and combination of the parts constituting the same.

BEEHIVE.—Geo. Eason, Lyons, N. Y.—The object of this invention is to provide a chamber for the deposit of the building cells, and that portion of the honey, on which the bees subsist, which may be readily adjusted to a capacity to suit the demands of the family, and also an improved arrangement of clear honey boxes.

PROJECTILE FOR FIRE-ARMS.—Charles F. Brown, Warren, R.I.—This invention relates to a new shell projectile, to be propelled by breech or muzzle loading ordnance, the shell being of that class which explodes, when it reaches the mark. The invention consists chiefly in the use of a tubular fuze holder within the loaded shell, and in the use of a plunger within the fuse holder, all operating in such manner that the fuse is ignited by the charge, which propels the shell, but that it does not ignite the powder in the shell until the latter has struck its mark, the ground, or some other object.

WIND WHEEL.—Benjamin H. Goodale, Newburyport, Mass.—This invention consists in an arrangement whereby the sails are suspended from the outer ends of the horizontal arms of a vertical shaft, in such a manner that the action of the wind will open them when they have arrived at the position when it will have no effect on them by direct action, and thereafter operate on them by reaction for a considerable portion of the revolution. It also consists in an arrangement of means for furling the sails, and thereby stopping the wheel, or unfurling them to set it in motion.

PARLOR AND FIELD BALL GAME.—William H. Wilsen, Providence, R. I.—This invention relates to a new game, which is partly one of skill and partly of chance. The invention consists in the use of a revolving pointer or index hand, moving over a disk on which numbers or words are marked, said index hand being either itself exposed, or having a pendant or arm which is exposed to the action of a ball thrown by the player. As the ball strikes the pointer or its arm, the same will swing around its pivot, and will, when it comes to rest, point to a figure, word, or mark, on the disk, thereby indicating the further progress of the game.

FIRE ESCAPE.—Jürgen L. Jürgens, New Orleans, La.—This invention consists of a car provided with axles made adjustable in the direction of the length of the same, and connected together by a shaft having a right and left hand screw thread, by which the said axles may be expanded or contracted as it is moved up or down inclined ways, placed outside of the building convenient to the windows of the same, to admit of the inmates of the building entering the car as it passes down from one window to another.

INSTRUMENT FOR REMOVING CORKS FROM BOTTLES.—George W. Schermerhorn, East Limington, Me.—This invention has for its object to furnish a neat, simple, cheap, effective and convenient instrument for removing corks from bottles.

PENCIL SHEATH OR HOLDER.—Samuel Ayers, Danville, Ky.—This invention has for its object to furnish a neat, simple and convenient device by means of which a pencil may be safely held in such a position as to be always at hand ready for use.

YOKE FOR HORSES AND OTHER ANIMALS.—Thomas J. Barnes, Cambridge, Ill.—This invention has for its object to improve the construction of the improved horse yoke patented by the same inventor, Nov. 5, 1867, and numbered 70,502 so as to make it more convenient and effective in operation.

HAY RAKE AND LOADER.—William H. Hiteshew, Perrysburgh, Ind.—This invention has for its object to furnish a machine, simple in construction and effective in operation which will collect or rake the hay and deposit it upon the wagon, doing its work thoroughly and well.

HORSE HAY RAKES.—William H. Cook, Bridgehampton, N. Y.—This invention has for its object to improve the construction of revolving horse hay rakes so as to make them more effective and convenient in operation than when constructed in the ordinary manner.

SORGHUM EVAPORATOR.—Jesse B. Lewis, Lincoln, Ohio.—This invention has for its object to furnish an improved attachment for evaporating pans by means of which the pan may be made self skimming by the use of which a purer and better article may be manufactured and with less labor than when the ordinary evaporating pans are used.

HEAD BLOCK FOR SAW MILLS.—W. A. L. Kirk, Hamilton, Ohio.—This invention has for its object to furnish an improved device for attachment to head blocks, by means of which the sawyer may conveniently a just the knee in such positions that a given number of pieces of a uniform width may be cut from timber of a given thickness.

TRUCK FIRE ESCAPE LADDER.—George Skinner, Brooklyn, N. Y.—This invention has for its object to furnish an improved truck extension ladder designed especially for use as a fire-escape but equally adapted for use for any of the purposes to which an extension ladder can be applied and which shall at the same time be light, strong, simple in construction, and easily operated.

PISTON-ROD PACKING.—Samuel Lockard, Lagrange Ind.—This invention relates to an improvement in packing around piston rods of steam engines and which method is adapted to other kinds of packing.

HYDRANT.—William Kearny, Union Township, N. J.—This invention relates to inventions in street hydrants for the supply of water to fire engines or for other purposes.

METHOD OF STORING GRAIN.—R. M. Mitchell, Fort Atkinson, Wis.—This invention relates to a new and useful improvement in the method of storing grain in store houses where the grain is elevated and delivered into bins.

CAR BRAKE.—G. N. Jones, Oshkosh, Wis.—This invention consists in the arrangement of a friction pulley upon the axles of each car, to which is connected by a cord a lever suitably arranged to press the brake against the wheel, when the cord is wound up on the said friction pulley. The friction pulleys are set into rotary motion by the action of cords attached to slides at the tops of the cars, which slides are actuated by a line shaft running from car to car, connected by universal joints between each car, which shaft is turned in either direction by levers and toothed segmental wheels, gearing with wheels on the shaft at the ends of each car, the lever being actuated by the brakeman.

QUARTZ MILL.—Samuel Swasey, Malta, Ohio.—This invention relates to a new and improved method of crushing and pulverizing quartz for the purpose of separating the precious metals therefrom, and it consists in providing a suitable mill with grinding stones, between which the quartz is subjected to a grinding process, and also in the manner in which the mill is constructed and the upper grinding stone is revolved and adjusted.

ROW LOCK.—P. H. Mills, Green's Landing, Me.—This invention has for its object to furnish an improved row lock to receive the oar when rowing, sculling, steering, etc., and hold it securely, while at the same time allowing it to be moved freely in any desired direction, and which shall be so constructed as not to be liable to wear or breakage, and will work without clattering, entirely doing away with splitting row locks, breaking pins, and other annoyances so common with row locks constructed in the ordinary manner.

VALVE GEAR FOR OSCILLATING ENGINES.—C. H. and D. B. Overton, Dover, N. J.—By this invention a common reciprocating slide valve is used in an oscillating cylinder, the stem of the valve being connected with a circular plate or disk, which has a reciprocating motion on the trunnion, which latter has two parallel faces planed on it for the disk to travel on. The disk is encircled by a hoop working easily on it, like an eccentric hoop, the said hoop being affixed to an eccentric rod from the crank shaft. This invention supplies the desideratum long existing in the use of oscillating engines, and provides a valve gear which is as simple and free from uneven wear as the valve gear of a fixed cylinder engine.

NAIL MACHINE.—Dennis Savery, Wheeling, W. Va.—The object of this invention is to cause the griper to retract as speedily as possible. It consists of a V-shaped spring having one end affixed to the cam end of the griper and the other end clasping or bearing against that side of the cam shaft which is opposite the griper, thus holding the end of the griper against the shaft, and by its tension actuating the griper against the shaft instantaneously after the cam has passed the tappet projection on the griper.

CENTRIFUGAL MACHINE.—S. S. Hepworth, Boston, Mass.—The object of this invention is to provide a centrifugal machine in which the pernicious effect of gyration is softened by suspending the curb and arranging it so as to afford the step bearing for the shaft of the basket, thus allowing both the curb and the basket to partake of the gyrating movement, which movement is softened by means of an annular rubber roll running around in a fixed circular step, a stud affixed to a cross beam in the curb working within the roll. Other devices pertaining to the hanging of the basket shaft and to the accessory brake mechanism conduce to perfect the operation of the machine.

BABY WALKER.—Fred Geisler, Bristol, R. I.—This invention consists in the construction and arrangement of the several parts, consisting of a circular platform provided at its vertical axis with a rotating shaft supporting a curved arm, at the end of which is secured a holder for supporting the child at the waist, in a manner to admit him to traverse the circular path of the platform.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

D. B., of Mass.—The art of making good furniture varnish cannot be given in a limited space. For a full account of the process we refer you to Ure's Dictionary of Arts and Manufactures.

A. D. M., of Conn.—Plaster molds for stereotyping should not be soaked with oil. A very little should be rubbed over the surface before making the cast. Use as little as you can, and touch entire surface, and the smoke will not trouble you.

S. M. D., of ——How can I make permanent and varnish water color drawings? First size them with a cold solution of isinglass in water. Then varnish with a varnish made of Canada Balsam 1 oz. and Spt's Turpentine, 2 oz. Mastic varnish is however the best. It can be obtained where artists materials are sold.

M. J. W., of Pa.—Is machinery used for laundry purposes in the putting of a finish upon linen. Answer, It is.

J. M. W., of Va.—The black dust used in making fire-proof mortar is the dust found about the forges of blacksmiths.

G. J. G., of Ga.—You may discharge the air from any part of perimeter of a blower without affecting the blast, but the length of the pipe through which you conduct will affect it materially. The shorter and straighter it is, the better blast you will obtain.

Business and Personal.

The charge for insertion under this head is one dollar a line.

NEW PUBLICATIONS.

CABINET-MAKER'S ALBUM OF FURNITURE. Comprising a Collection of Designs for the Newest and most Elegant Styles of Furniture. Illustrated by Forty-eight large and beautifully Engraved Plates. Philadelphia: Henry Carey Baird, Industrial Publisher, 406 Walnut street.

This book is entitled to, and will receive the approbation of all interested in the ancient and beautiful art of cabinet-making. Every design is an art study. It should be in the hands of every member of the craft. No workman could fail to be benefited by the study of such designs. Sent postage free on receipt of $5.

NEW ROCK DRILLING MACHINE.

We witnessed on Tuesday in company with Mr. I. B. Reynolds of Rutland, Vermont, the operation of a drilling machine recently invented, and of which he is one of the proprietors. The machine consists of an upright boiler, having an oscillating steam cylinder attached which drives the drill, and a pump which constantly forces a stream of water into the bore-hole. The drill is a short hollow cylinder of iron armed with diamonds placed upon the lower end, which is serrated, to form seats for the diamonds. This tool is fixed to a hollow tube of iron to which two gears are attached, connecting with the primary gear, which is driven by the steam cylinder. The upper and lower gear give, by the ordinary adjustment, reverse motion to the tube. The water is forced through the tube by the pump and effectually clears the bore-hole of detritus. The cutting is done in a circle, by the revolution of the tool, and a plug is left which passes up through the tube as the latter descends, leaving, however, sufficient room for the descent of the water. This plug or cylinder of rock is easily broken off and removed, and is in many cases valuable, as it is always a good specimen of the rock through which the boring is done. Surveys may thus be made of rocks deeply imbedded and their quality ascertained with comparatively small expense. The machine, working at moderate speed, bored in our presence a very smooth, round hole, through extremely hard rock, at the rate of one inch per minute. The diameter of the hole drilled was one and one half inches. Inspection of the drilling tool with a magnifying glass, showed no appreciable wear. The machine is perfectly automatic, and will drill with equal facility at any angle.

DANNER'S PATENT PENCIL GUARD.

The little device illustrated in the engraving is designed for clerks, freight agents, merchants, and others whose business requires during business hours frequent resort to the common lead pencil. It is intended as a holder for the pencil and a guard to its point, so liable to be broken and so annoying to frequently sharpen. The guard pinned to the coat or vest, is a much better receptacle for the pencil than the pocket, and it has the advantage of being always ready and in place for use. It is a simple sheath of sheet metal, of a proper diameter to receive the pencil, the lower or closed end being of a larger diameter and lined with a circular or cylindrical gland of india-rubber designed to embrace and hold the pencil. In the engraving the pencil is seen with the sharpened point protruding, but it may be placed in the sheath by either end. Two spring needles or pins serve to secure it to the clothing. It is durable, and cheap. It may be made of white metal, sheet brass, or other material, and can be left the natural color of the material, plated, or japanned.

Patented, June 16, 1858, by John Danner, Canton, Ohio, who may be addressed for additional particulars.

The New Oxygen Light.

The American proprietors of the oxygen light, recently invented in France, have been submitting it to Prof. Doremus for examination and experiment. We understand that the results of these experiments have been so satisfactory that a company has been formed to introduce the invention. A large laboratory is to be erected, two hundred feet long and one hundred in breadth, on Forty-first street, in this city, for the extensive manufacture of oxygen gas. This gas is to be mixed with the ordinary street gas. An exchange says:

"It is not intended to lay pipes in the thoroughfares for the conduction of the oxygen for some time, even if the company were authorized, but they do propose conveying it in portable vessels to the buildings, public or private, in which it may be desired for illuminative purposes. Mr. Booth is placing throughout his new theater on Sixth avenue duplicate pipes, so that, when the oxygen is manufactured in quantities sufficient, it can be introduced without delay, and many gentlemen of fortune who have seen the light at the office of the company in Nassau street are also anxious to have it in their houses.

"About the middle of November, it is thought, the new light, which is nearly 200 times more brilliant than that emitted by a wax candle, and 14 times more powerful than the illuminative power of carbureted hydrogen (19½ times that of the gas made by the Manhattan Company, as shown by actual measurement in the laboratory of the College of the City of New York), will be formally and permanently introduced. It is not only more powerful, as has been demonstrated, in brilliancy, but, compared with the ordinary gas light, many per cent cheaper. A thousand cubic feet of oxygen will cost the consumer, it is estimated, $25, and a thousand feet of street gas, $3, or $28 for two thousand feet of oxygen and carbureted hydrogen, which total of mixed gases is equal in their illuminative quantities to not less than 28,000 feet of the gas that is consumed in our street lamps, at a cost of $74, or $46 more than apart from its great steadiness, purity, and beauty, the oxygen light it is now believed will cost. This will certainly, in the course of a year, aggregate to the people of a city so large as is New York an enormous saving."

BURGESS' PATENT WINDOW WIPER.

Next to the nuisance of washing off side-walks with hose in our cities is that of window-washing. In summer this is

Fig. 1.

simply an annoyance; in winter absolutely dangerous, as the flagged or bricked walks are made really unsafe for pedestrians. The rebound of a stream from the nozzle of a hose pipe against a window in warm weather will do no other damage than to wet and soil the clothes, but a fall on slippery pavements jeopardizes life and limb. To prevent this splashing of water with its accompanying annoyances in washing windows is the object of the device illustrated in the engravings.

It is a rectangular frame, A, made of sheet metal, as tin, and attached by a swivel to a handle so that it will freely rotate. The sides are perforated, as seen in Figs. 2 and 3. On one of these faces, B, is secured, by means of elastic bands, a washing cloth of Canton or woolen flannel, or other material, or, for polishing the windows, a piece of chamois skin may be substituted. The other face, C, is covered first with a sheet of rubber or other elastic material, over which is drawn a wiping cloth two yards or more in length, and wound on rollers inside the frame or box. One end of this cloth is secured to the pivot, D, of the box, which passes through it from end to end, and the other to a roller inside the box, having a crank E, on the outside of one end by which the cloth may be wound up, thus presenting a dry face as fast as that portion in use becomes wet. By turning the box on its pivot or swivel the cloth may be wound or unwound on the central spindle at pleasure.

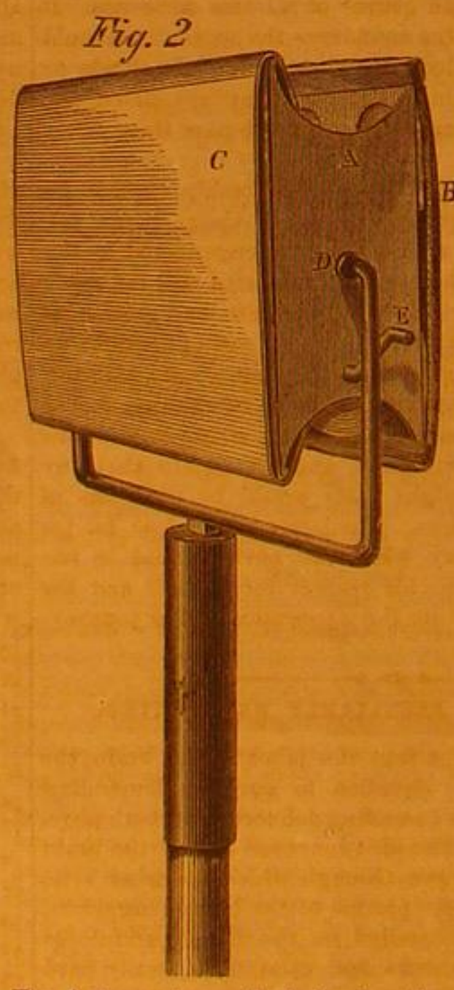


Fig. 2

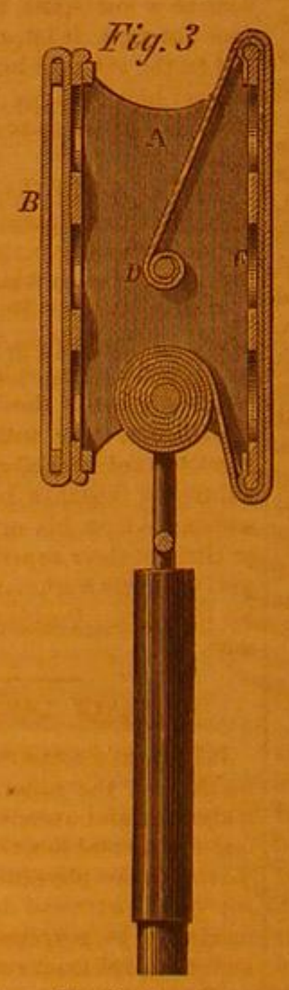


Fig. 3

Fig. 1 shows the method of using the device; Fig 2, gives a perspective view, and Fig. 3 is a transverse section. The rectangular form of the implement allows it to work into the corners of the panes. By the use of this implement there is no necessity of climbing steps or chairs, and as there is no spilling and spattering of water it may be employed for inside as well as outside cleaning. The box can be reversed instantly to wash or wipe. Its advantages are apparent at a glance.

Patented July 28, 1868, by B. F. Burgess, Jr., who may be addressed at 9 West street, Boston, Mass. The patentee is desirous of disposing of the entire right, as he is engaged in another business, and the price and terms will be made correspondingly accommodating.

A Large Elevator in Boston.

Boston is to have another big feature beside the great organ. The Boston and Albany Railroad corporation are erecting a new and capacious grain elevator. The plan of the building is somewhat different from the large elevators at Albany, N. Y., Chicago, and other places. The building is making of brick and wood, and will be about seventy feet high. The upper or wooden story will contain 82 bins, some of which will contain 1,500 bushels of grain, and others twice that amount. The total capacity of the edifice will be 250,000 bushels. The machinery will be worked by steam, and there will be millstones to grind corn for patrons. On the lower floor is a track to accommodate three freight cars at the side. The center of this floor is occupied by a deep vat, into which the grain will be shoveled from the cars in a very few minutes, and the empty cars will then be run out and three full ones take their place, and so on. In the center of the building will be a shaft running up to the roof. An endless belt runs over a wheel at the roof and another in the vat, the face of which is covered with cups, and as the belt will constantly move, those cups will ceaselessly go up full and come down empty.

At the top another form of propulsion will carry the grain into any particular bin desired. By this process a car load of grain can be brought direct from Chicago, emptied at the elevator, in the elevator, in ten minutes, and the car sent back the same day. The cost of elevating and storing the grain will be one cent per bushel for the first five days, and for a longer storage so much for every ten days. The grain can be readily removed from a pointed opening in each bin. The detention of cars loaded with grain, while waiting for merchants to take it away, will be remedied, and the facilities for storage will be an item which it is expected Western merchants will appreciate. The elevator will be in working order in about two months.

New Theory about the Formation of the Diamond.

The origin of the diamond has been a subject of much speculation, inasmuch as the circumstances under which it is found in nature afford us no clue to the process of its formation.

Lately, Prof. Simmler of Switzerland has added a new theory to the many existing ones, which seems to us to be the most probable of all. The diamond often incloses cavities, which in some instances contain a gas, in others a liquid. Sir David Brewster, who had given much attention to the subject, found in investigating the nature of the liquid, that its refractive power is less, but its expansive power greater than that of water. Further inquiry as to the probable nature of these substances was not made until quite recently.

In comparing the results obtained by Brewster with those calculated for other liquids, Simmler found the numbers for the expansive and refractive power of the liquid referred to, to coincide singularly with those for liquefied carbonic acid. But other facts observed by different savans, tend to prove also the presence of this agent in the coating of the most valuable of gems. We mention the bursting of such crystals, when exposed to heat, the frequent occurrence of two liquids in the cavities, wherefrom the one behaves like water towards heat and light and the other like liquid carbonic acid. On one occasion it was observed that the liquid in a quartz crystal which was dashed to pieces, scattered its contents around with a great noise, burning holes in the handkerchief wound around the hands of the experimenter. The acid content itself had disappeared. Upon these observations Prof. Simmler establishes his theory. If carbon, as he supposes, is soluble in liquid carbonic acid, it would then only be necessary, to subject the solvent to slow evaporation—the carbon would thereby be deposited and by taking proper care assume crystalline forms. In evaporating quickly, the so-called black diamond might perhaps be produced, which in the state of powder is largely used for polishing the colorless diamond. Though the liquid referred to has never been subjected to chemical analysis, the formation of liquid carbonic acid in the interior of our globe, may nevertheless be considered as highly probable. In the gaseous form, we know it to be evolved in immense quantities from fissures, volcanoes, and mineral springs. When now this gas is produced in the cavity of a rock which is free from fissures, it will finally be compressed so highly, that it will assume a liquid form by itself. Certain rocks may be considered strong enough to resist the expansive force of this agent. Let now carbon be present. If the same is soluble, it will be taken up and deposited again while the carbonic gas is escaping through some newly formed cracks or fissures.

Chinese Grammar.—Max Müller recommends the study of the Chinese grammar. "Those," he remarks, "who can take an interest in the secret springs of the mind, in the elements of pure reason, in the laws of thought, will find a Chinese grammar most instructive, most fascinating. It is a faithful photograph of man, in his leading strings, trying the muscles of his mind, groping his way, and so delighted with his first successful grasps, that he repeats them again and again. Every shade of thought that finds expression in the highly finished and nicely balanced system of Greek tenses, moods, and particles, can be expressed and has been expressed in that infant language by words that have neither prefix nor suffix, no termination to indicate number, case, tense, mood, or person.

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Contents:

(Illustrated articles are marked with an asterisk.)

ONE IDEA MEN.

An exchange says that "one idea men are seldom healthy wealthy, or wise." It adds that "It matters not whether they be crazy philanthropists, wild enthusiasts, or dull dirt diggers. Nature abhors such men quite as much as she does a vacuum and invariably punishes them. She loves variety and has furnished it in endless profusion in all her works." The above is a good example of the glittering generalities, which captivate the minds of men by their sound while sense is lacking. The statement is not true, while the illustrations drawn from nature are either false or inapplicable. The idea that nature abhors a vacuum was long since exploded, and although nature has furnished an infinite variety of all that is pleasing and useful to man, as well as some things which are not so obviously pleasant and useful, we find upon the most superficial observation each animal or plant confined to certain functions which are the purpose or the "one idea" of its existence. Cows do not attempt to fly, nor birds to burrow in the earth, unless they are sand-martins, and it is just as absurd to suppose that all men or that any man can know or do everything, as to suppose bees capable of giving milk, or pigs to hive together and make honey.

The truth in regard to this matter is that men who achieve great eminence, or accumulate wealth by their own efforts are "one idea" men in the highest sense of the term. Philosopher or reformer, inventor or merchant, each must have a definite aim in view to be successful, an aim to which all other knowledge, all side issues, all effort must converge, and this aim then becomes the one idea until its accomplishment.

It is difficult to conceive of any field of exertion where such concentration of thought and effort will not result in success and even fame. The best rower, the best skater, the best dancer, the orator who rules the hour, the actor who draws the crowd, the eminent jurist, the eloquent divine, all are men who have earned their supremacy by dint of persistent effort in one direction. No matter how humble or how frivolous an occupation may be, a man who is superior in it to any other has secured, if he has not attained, all the success which can be expected in his peculiar field; and whether in learned professions, or mechanical arts, it has been just such one idea men who have always gained distinction. And we repeat they always will gain it.

Nor is devotion to a single purpose opposed to liberal views and general attainments. On the contrary, we have always found those men who are called one idea men, more liberal in their views of affairs, more tolerant of others opinions, and more highly cultivated than the "Jacks at all trades," by far more numerous and blatant, with whom we come in contact. A distinguished clergyman once assured us that he never read the Bible with greater pleasure or profit, or attained more scriptural knowledge in an equal time, than when he perused the Old Testament with the one idea of tracing link by link the genealogy of Christ. It is impossible for the mind to closely examine any subject without making it a focus upon which is brought to bear the concentrated light of collateral science or philosophy. Hence it is that minds which have been closely kept upon a single subject of life study although they may not have skimmed over so many topics as others, who think more disjointedly, come to be recognized authorities. What they know they know thoroughly, and their opinions may be depended upon. Probably no man ever existed of more diversified attainments than Watt, and no man ever was a more strictly one idea man than he in the just sense of the term. A distinguished author forcibly remarks that "in the secular sphere it is conceded that the powerful minds are those who rigorously confine themselves to one department of thought. Newton cultivated science and neglected literature. Kant wrought in the quicksilver mines of metaphysics for fifty years, and was happy and mighty in his one work. These men made epochs, because they did not career over the whole encyclopedia. And the same is true in the sphere of religion. The giants in theology have dared to let many books go unread, that they might be profoundly versed in revelation. And the mighty men in practical religion, the reformers, the missionaries, the preachers, have found in the distinctively evangelical elements of Christianity, and their application to the individual soul, enough, and more than enough, to employ all their powers and enthusiasm."

In practical mechanics, as well as in philosophy, we have always found this class of men to be the most reliable, and successful, and for these reasons as well as many others we have not stated, we say give us the one idea men.

TREATMENT OF APPRENTICES BY "OLD HANDS."

The love of power and its exercise, the assumption of superiority in position and knowledge, tend to make tyrants of all men. But nowhere is the exercise of this disposition more unpleasantly seen and more unpleasantly experienced than in the shop. It is very hard for the boy, perhaps just from school, where his labor was merely that of the mind, and where, perhaps, he had the sympathy as well as the assistance of a judicious teacher in his tasks, to come as an apprentice in the shop and accustom his untried hands to the hard substance of metals and woods, without his being compelled to bear the harder taunts, jokes, and witticisms of his seniors. Yet these he must, not unfrequently, bear. Instead of trying to make the apprentice's course plain, smooth, and pleasant, it is too often the case that the journeymen, otherwise sensible and considerate, encourage if they do not inaugurate a system of petty annoyances and petty tyranny, as disgraceful to their character as men as it is confusing and cruel to the victim. There is nothing manly in this. If it is designed to impress the novitiate with the superiority of the attainments of his tormentors, that end could be gained as readily by quietly pointing out his failures, and instructing him in his duties.

This victimizing of apprentices is a relic of barbarism, imported here from the old countries, England especially, where the lower class of workers seem to have the idea that brutality is the only proof they can give of their superiority over their inferiors. We have seen many cruel experiments tried by this class of men who disgrace their nature and calling. Imposing upon ignorance, betraying confidence, and falsely swindling the trust given them, they take a demoniac pleasure in fooling, bothering, and annoying those they should be proud to instruct and assist.

To a lesser extent this course is pursued in almost every shop in the country. Where this spirit dares not be manifested openly, in the way of practical miscalled jokes, it is in either giving false information, or a refusal to give any; in a neglect of the common shop courtesies, and a supercilious manner and pretentious bearing. A miserably mean jealousy, born of a low spirit, is the source of all this nonsense. It does not pay. It impairs the confidence the apprentice should feel in the superior knowledge of the journeyman, tends to disgust him with his business and his future associates, and leads him to refuse to listen to the instructions of those wiser than he.

Possibly, before the time of his apprenticeship expires, he may learn to estimate these annoyances at their proper value, but it is more certain that the feeling engendered by the foolish tyranny to which he has been subjected will influence him through life. How much better for him, and more honorable for his seniors, that they gave him encouragement by word, and assistance by act, so that the young man striving to become one of the honorable guild of mechanics, should feel at once, in his introduction to a shop, a fraternal sentiment toward his fellow workmen, and be certain that any failures or mistakes he might make would be occasions of assistance from his superiors. The latter would lose no jot or tittle of their superiority, while the novice would be improved in his workmanship, his respect for himself and for his teachers. Deal justly by the apprentice, fellow journeymen.

IS BRAIN LABOR PECULIARLY EXHAUSTING.

It is quite a common idea that the labor of the brain, the tasking of the mind, the devotion to pursuits demanding mainly mental exercise, is exceeding deleterious to both physical and mental health. The idea conveyed is that the brain (if that is the physical organ through which the mind acts) is a very tender and delicate portion of the human organism, needed to be perpetually dandled on the lap of carefulness and preserved from rude shocks and even from steady hard work.

The exhausting labor of the muscles, such work as handling heavy bodies while exposed to hot sun or chilling winds—that work done by teamsters, stone and brick masons, farmers, hod carriers, etc.—seldom receives notice from writers who harp on the exhaustive nature of brain work. There are other employments, not requiring, perhaps, so great an outlay of physical power, but which are dreadfully monotonous, merely mechanical, and without the stimulus of mental interest, which are never mentioned as peculiarly exhausting; yet probably few brain laborers would be willing to drive a team, pave streets, build houses, or weed an onion bed rather than think, and write, and talk.

The ultimate result of this reasoning about the exhaustive nature of brain work would be to reduce the worker to a mere machine or a mere animal, and instead of our leaders of thought, our contrivers of inventions, our producers of improvements, and our intelligent mechanics, we should have a community of human clods, eliminating no new ideas, applying to new purposes no well known principles, and making no new improvements. If it is said that the excess, rather than the exercise of brain work, is what should be guarded against, it may be replied that what is excessive labor to one is mere play, or, at least, no task to another; each man is the best judge of the limit of his mental as well as of his physical powers.

There are no more persistent brain laborers than our mechanical inventors and scientific discoverers, yet we do not remember any instance where either of these classes, because of their devotion to their specialties, have become insane or died from softening of the brain. We believe the brain is as strong as the muscles, that it will as quickly give the alarm and demand rest as the legs or the arms. We think our inventors and mechanics need not coddle their brains any more than their biceps muscles. We are thinking animals, and thinking is healthier than mental stagnation.

PROGRESS OF THE ART OF DENTISTRY.

Although from remote periods attention has been paid to the means of preserving and beautifying the teeth, it is only within the last century that the art of dentistry has attained the rank of a distinct profession. All that is known of the early practice of the art has been derived from the remains of teeth found in ancient sepulchres, and the meager allusions to the subject found in the works of Greek and Latin authors. Galen wrote upon the subject in the second century, and Fallopius, Eustachius and Paré in the fourteenth, fifteenth, and sixteenth centuries, but no elaborate treatise appeared until the eighteenth century. The most prominent of those upon which the modern school of dentistry may be said to have been founded, was the celebrated treatise of John Hunter.

The authors of these works, were however, not practical dentists, and their works relate principally to the anatomy of the teeth, and the nature of the diseases to which they are liable, rather than to the repair of decayed teeth, and the supply of artificial ones, which now are the prominent features of the art. Since these writers, there have appeared numerous treatises of a more practical character, and the progress of the art has been constant and rapid.

The art of filling teeth with gold is a very old one, and was practiced by the Egyptians, as also the substitution of artificial teeth of wood and ivory fixed to plates of gold. The practice of filling or plugging teeth with metals, as well as the fixing of artificial teeth to plates, was revived upon the invention of porcelain or mineral teeth, which took place in the earlier part of the present century.

Mineral teeth were originally a French invention, but they owe their perfection principally to American improvements. They are now made so as to imitate almost perfectly the natural teeth, as well as the gums, in form and color. The artificial teeth made of ivory, or the teeth of animals modified in form to resemble human teeth were completely superseded by the porcelain, as soon as their merits became generally known; mineral teeth being more cleanly, as well as more natural in appearance. Gold, silver, and platinum were used to mount them. The demand for the services of the dentist was largely increased by the adoption of this improvement.

The introduction of rubber-plate in the mounting of teeth, also, by greatly reducing their cost, greatly increased the demand. Teeth thus mounted gave great comfort to the wearer from the lightness and elasticity of the plate. Some doubt was at first felt as to their effect upon the health, as well as their durability and cleanliness; but while in these respects rubber is, undoubtedly, somewhat inferior to gold plate, it is not so much so as to greatly depreciate the value the improvement, and their popularity is daily increasing.

The dentist has latterly been called upon to enlarge his field of operations. Eminent surgeons have not failed to see that the resources of the art were equal to the accomplishment of more than the repair, and restoration of teeth. It was evident that it might be extended to the connection of malformations as well as to the artificial supply of parts which had fallen a sacrifice to disease, or had been removed by the knife of the surgeon. Thus a new and extensive field is opening, and a more extended knowledge of general anatomy and the principles of surgery is required of the professors of this art than has hitherto been requisite. The professors of general surgery are beginning to recognize a powerful adjunct in the sister art of dentistry. The *Medical Gazette* announces that hereafter, a department devoted to dental science is to be a feature of that publication. We hear of colleges of dentistry in successful operation in different parts of the country, and of others being projected, while among our most valuable exchanges are the journals devoted exclusively to this art. These facts are a sufficient warrant that the art is still a progressive one and there can be little doubt, that the future will see dentistry taking its proper and legitimate rank among the learned professions.

POWER LOOMS IN THIS COUNTRY.

Although the art of weaving is of such antiquity that no records exist as to the date of its discovery, it is only about eighty years since the first power loom was invented, and not so long since it was so far perfected as to possess a decided superiority over the hand loom. To Rev. Edmund Cartwright, in 1787, belongs the credit of constructing the first successful power loom.

In this country power looms were first built and set at

work in Waltham, Mass. Mr. Francis Cabot Lowell, for whom the city of Lowell, Mass., is named, returning from England in 1812, after a two years' visit, which he employed largely in examining the improvements introduced in manufactures, attempted the construction of a power loom. He employed Mr. Paul Moody, of Amesbury, Mass., an ingenious mechanic, to build the machine, and it was finished, patented, and in successful operation in 1815. Probably the efforts of Mr. William Gilmour, who, in 1814, came to this country from Glasgow, bringing patterns of the power loom, and who was employed by Judge Daniel Lyman, of Providence, R I., the associate of Mr. Lowell in the enterprise, contributed to the success of the Waltham loom. About the same time Gilmour built looms for several of the Rhode Island manufacturers. His loom cost only $70, while the Waltham loom cost $300.

From this time forth power looms became the rule, and hand looms the exception. New patents were being issued frequently, and new styles of the loom were being constructed. The mills which had been employed mainly in spinning yarn to be woven at home in the family, began to be used for the weaving of cloths, and the immense cotton manufacture of the country may be considered to have been fairly inaugurated.

ON THE CAUSES OF EXPLOSIONS WHICH OCCUR IN THE POURING OF LIQUID METALS INTO WATER.

Dangerous explosions have repeatedly occurred in pouring liquid metals into water. Mr. Kayser refers to a case in Upper Silesia, where in pouring several casting-ladles of melted pig iron into a pan filled with water, a frightful explosion took place, killing one man and wounding several others. Similar cases have been observed at the Altenau Iron Works in the Upper Harz, when for the preparations of a bath liquid iron was poured into a Pattinson pan, and another occurred at the preparation of granulated iron in lead works of the same district. To this end the pig iron was conveyed from the furnace through a groove to a perforated and clay-covered iron ladle, when it was left to drop in a small stream into a basin with water, which had the advantage of a stream of cold water continually passing through it. Explosions had never occurred. One day, however, when experimenting with the thickish product, the holes of the ladle were choked. The iron naturally escaped in a strong body over the rim in the basin. In the beginning it did not show any suspicious effect but after some time, the contents of the basin, water, mud, and glowing iron, exploded among the numerous visitors, who rushed speedily out of the foundery. Happily they escaped with a fright and some slight burns. Kayser refers the causes of these explosions to the following: If liquid metals are poured into water which is nearly boiling, a great quantity of steam is suddenly generated with a detonating effect, equal to that of gunpowder. The shock produced by the high expansive force of the steam is communicated by the medium of the water toward all sides, as it is, for instance, the case in the blasting of ice with petards. When the sides of the vessel do not possess enough resistance in such a case, they are of course shivered to atoms.

If the water bears an insignificant relation to the mass of the metal it is suddenly converted into steam of a much greater volume, a violent explosion ensuing, as metallurgists can attest sufficiently.

If the water is cool, it absorbs the heat contained in the liquid metal, and no explosion can possibly occur. In granulating metals, they are left to flow in a small stream in a vessel of water, which is constantly kept cool.

In the refining of copper, the plates are immersed vertically in the water, in order that the generated steam may escape in safety; if they should be placed horizontally, explosions would most certainly occur. The pouring of the cooling water upon the surface of the copper in the finery must also be done with particular care.

Perhaps it is well known that all throughout Germany at Andreas Eve (30th November), or at the last day of the year, lead is poured into water, and from the forms which it assumes, future events are foretold. When the water is cool, the lead will disappear with slight hisses, and it will be found afterward in different forms in the bottom of the vessel, but if warm, it may occur that the vessel is shattered with violence.

A Practical Guide for the Perfumer.

The above is the title of a new treatise on perfumery by Professor H. Dussauce, chemist, author of several other practical works of high repute. The book contains a description of the substances used in perfumery, and the formulas of over one thousand preparations, many of which have not hitherto been described. It will prove valuable not only to the manufacturing perfumer but to druggists and dealers. Beside the information contained in the technical portions of the work, we find the following remarks upon the nature of perfumes, and their extreme tenuity which will be of interest to the general reader:

"An odor, in general, is an invisible, imponderable emanation from fragrant substances. Odors cannot be propagated in the same manner as caloric and light; their movements are not submitted to the laws of reflection and refraction. They spread incessantly in the air, which is their vehicle, and follow the currents of the atmosphere.

"The works of distinguished chemists and natural philosophers prove that an odor is produced by very small molecules which are disengaged from odoriferous bodies; these molecules float in the atmosphere, hanging on the different surfaces they meet, communicating to them their properties. When the odoriferous molecules are in contact with the olfactory membrane, the sense of smell is brought into action, and the brain perceives the odor. The olfactory apparatus is then indispensable to the impression of odors. For beings naturally or accidentally deprived of this organ there is no odor just as no sounds exist for him deprived of the sense of hearing.

"The odoriferous molecules or particles are of such infinitesimal tenuity that the bodies which disengage them all the time seem not to lose anything of their weight, or at least to make insensible losses; and however numerous these particles may be, an exact calculation has shown that one grain of musk had in a radius of ninety feet disengaged, in one day, 56,839,616 particles, without any diminution in its weight This same grain of musk, abandoned to itself for six months in a large garret, communicated its odor to all the objects in the room, and being weighed in an accurate scale, it had experienced no loss.

"A rose, in a few hours, can perfume 10,000 cubic feet of air, without losing in weight.

"A piece of sugar on which a single drop of oil of thyme is poured, and being ground with a little alcohol, communicates the odor of the thyme to 25 gallons of water.

"Haller kept for forty years papers pefumed with one grain of ambergris; after this time the odor was as strong as ever. Bordenave has evaluated a molecule of camphor sensible to the smell to 2,263 584,000th of a grain. Boyle has observed that one drachm of assafœtida exposed to the open air had lost in six days the eighth part of one grain, from which Keill concludes that in one minute it had lost 1-69,120th of a grain, and, by another calculation, he demonstrates that each particle is 2-1,000,000,000,000,000th of one cubic inch. In that calculation, he supposes the particles equally distant in a sphere the radius of which is 5 feet; but as they might be more compressed toward the centre, Keill began again his calculation, and found that in that case it was necessary to multiply by 21 the number of particles, 57,839,616, given above, which produce 1,214,631,936; and he found that the volume of each particle is 38-1,000,000,000,000,0 0,000th.

"The prodigious tenuity of odoriferous molecules made Prof. Walker think that the sensation of odors was not due to the contact of these molecules with the olfactory membrane, but to a dynamic action of the odoriferous body on the smelling sense.

"Dr. Starch, of Edinburgh, has published a paper in which we find some very curious experiments on the emission and absorption of odors. According to his theory, the tissues of animal substances have more affinity for odors than vegetable tissues. The absorption of odors by outward tissues is subject to the same law that governs absorption of caloric, that is, black tissues absorb the most odor; and this absorbing power diminishes, as the color becomes lighter, in such a manner that white tissures are those which absorb odor the least.

"Odors impregnate all bodies in different degrees, and combine with nearly all the liquids. Gloves retain for a long time the perfume of ambergris; paper and cotton, that of musk. Oils and greases retain very well balsamic and volatile principles. Water, and especially alcohol, dissolve perfectly the aromatic principles of flowers. It is on this knowledge that is founded the fabrication of waters, oils, essences, pastes, pomades. Thus the perfume of flowers, so light, so fugacious, is rendered stable by art and industry. At the moment the perfume escapes from the flower, man seizes it, masters it, and uses it to increase the sum of his enjoyment.

"Odoriferous bodies may be so all the time or only at certain periods. Thus some exhale their perfume in the morning, others in the middle of the day, some in the evening, and many during the night. Different circumstances may also cause the intensity of the odors to vary, such as dampness, light, heat, etc; the addition of another substance, also, develops the strength of an odor which, alone, was nearly insensible."

The work is published by Henry Carey Baird, 406 Walnut street Philadelphia, and will be sent to any address free of postage upon the receipt of three dollars.

Woods Used in Cabinet Making.

Mr. Thomas Paterson was one of the working men who visited the Paris Exhibition last year, and ably reported on what he saw there. His report is one of the twelve which compose the little work under the title of "Modern Industries," issued under the auspices of the Paris Excursion Committee. In looking through the magnificent collections of woods from Brazil, Canada, and New South Wales, and the smaller but not less interesting exhibits of Algiers, Natal, Guinea, etc., it is impossible not to be struck, says Mr. Paterson, with the small number of these woods which are in actual use in the manufacture of furniture. Some of the woods are shown to be of large size, and are exceedingly beautiful in color and figure, and many of them would contrast admirably with some of those at present in use.

There was a contribution to the Exposition of specimens of timber, collected by the late Captain Fowke, in which several hundreds of different kinds of wood are arranged in a kind of revolving screen. Each specimen is labeled with its specific gravity, and the amount of weight necessary to break it. Each piece was of the same size—viz., two inches square, and has been actually broken by the weight marked on it, thus giving any one accustomed to work in wood a very good idea of the use it may be put to. Collections of this kind would be of the greatest use. They might be accompanied with a book composed of leaves of the woods, prepared and polished, to show their texture and color, with labels giving the average size of which boards could be cut, the average price, and the market, etc. At present neither artist nor workman is aware of the resources which are at their disposal, and much meretricious ornament would be avoided if this mine of decorative riches were fully explored. In the French colonies department there were some articles of furniture which have been made from the woods of Cayenne, cut by the convicts sent to that settlement.

That a wide and systematic acquaintance with the resources of any country is the first requisite to the development of its trade may be considered an obvious truism; yet in this country, eminently trading and manufacturing, and depending for its greatness upon the growth of its trade and manufactures, no means are taken to make the traders and workers acquainted with the materials which are being wasted in our vast colonies, but which, if known, would be sources of wealth which we can scarcely over-estimate. The staghorn sumac may be mentioned as an example of a very finely veined wood, which seems to be plentiful, and which, though it does not grow to any great size, would be useful in manufacture. The butternut, a kind of walnut wood, grows to a large size, and seems to be very cheap. The kauru (or New Zealand pine), also, a wood to veneer upon, would, I think, be of the greatest value; as well as the heron pine (which is sufficiently handsome to be used without any veneers), the red beech, and many others.

As a new application, or, rather, the extension of an old process in the treatment of wood, the chairs and settees in the Austrian department, made by bending long slips, may be instanced. Some of these chairs were exhibited in 1862. The manufacture has, however, greatly improved since that time. One chair in the Exposition (purchased by the Prince of Wales) was all that could be wished, both as regards strength and beauty. Though no one would wish to see this system of bending wood applied to all articles of furniture so exclusively as it is applied in the manufacture of these chairs, yet the capabilities of the process are well shown, and much might be learned from them. I noticed a method of producing a very good kind of decoration on polished wood by stamping with what is called by chasers a mutt tool, which produces a slighly roughened but regular surface, the pattern being left polished. I observed, also, in passing round the Historical Gallery, a mode of decoration which had an extremely good effect. This was an application of tortoiseshell The under surface or side applied to the piece of furniture had been polished and gilded, the outside surface of the shell being then carefully smoothed and polished, the gold showing through the semi-transparent shell, and giving all its markings, while the shell protected the gilding, so that, though it had been made for more than twenty years, it was still beautiful and effective. It seems to me much to be regretted that some method cannot be devised which would place all such methods of decoration so completely before all our workmen and designers that they might have them, so to speak, at their finger-ends.—*London Building News.*

Kennedy Electric Clock.

An exhibition of this clock, to gentlemen of the press, was made on Wednesday, at the rooms of the company in this city. The clock is impelled by the motion of the pendulum, and is of extremely simple construction. The pendulum ball contains a permanent magnet, which is alternately repelled by oblong helices placed on either side of it at a proper distance. The helices connect with a zinc and carbon earth battery, and the circuit is alternately broken by a commutator attached to the pendulum rod, which is of rosewood, baked, and saturated with paraffine. The clock will run without winding, or any other attention, after the primary adjustments are made. It is said that its regularity and accuracy are superior to clocks of any other construction. We may, at some future time, give a more extended description of this invention.

Editorial Summary.

Work to Line.—We were once acquainted with a cabinet-maker, a true mechanic of the old school, who was noted for his great skill, and his success in business. It was his pride to feel that, when occasion demanded, he could astonish his workmen by the performance of work which would put their best efforts to the blush. We once asked this man, who was a thinker and a philosopher in his way, what he considered the secret of good workmanship in his special craft. His reply was—it is the secret of success in life—"First, carefully lay out your work, then *work to the line.*"

The bones of a gigantic race of Indians have been discovered near Marlboro Point, on the Potomac river. The discovery of a large number of beads, moccasins, etc., leave no doubt of the character of the remains. Further investigations are to be made. The condition of the remains indicate that they must be centuries old.

Two more beautiful frescoes have been found at Pompeii, supposed to be portraits of the master and mistress of the house in which they were discovered. The woman is represented as seated, and preparing to write. The frescoes have been sent to the museum at Naples.

Hippophagy has not met with success in Paris. The government was willing, the *savans* urged the people to eat and set the example, the storekeepers added horseflesh to their stock, but customers were lacking, and there are indications that the movement will be abandoned.

Mistakes will Happen.—An error crept into our Mining and Manufacturing Items, last week, in regard to the amount of lumber shipped from the Saginaw Valley. Instead of four hundred, it should have been four hundred millions of feet.

STARVATION IN THE RED RIVER COUNTRY.—Accounts from the Red River region indicate that the ravages caused by the grasshoppers, render famine imminent. The St. Paul *Press* says: "Nothing but the most prompt and most energetic measures, prosecuted upon the largest scale, can avert from the people of Red River the most awful calamity of modern times." It adds "that the time for obtaining relief is extremely short, as within a few weeks the people may be walled in by five hundred miles of snow from any possible aid except what they may dribble through on dog trains."

ARTIFICIAL MAGNETIC OXIDE OF IRON.—M. Sidot has communicated to the Academy of Sciences a paper "On the Artificial Production of Magnetic Oxide of Iron." This he does by introducing a small platinum disk, filled with colcothar, into a porcelain tube, situated in a direction parallel to that of a dipping needle. After keeping the tube at a temperature a little below a white heat for about an hour, the colcothar will be found transformed into a gravish metallic oxide, the particles of which are strongly agglomerated together. This mass possesses the property of polar magnetism.

AMERICAN RIFLES FOR FOREIGN GOVERNMENTS.—We hear that the Remingtons, of rifle notoriety, have built for the Swedish government 30,000 of their rifles and nearly completed an order for 40,000 for the Danish goverment. It is said, also, by our informant, that the Chassepot, not proving all that was expected, the French government are about to contract for a large number of the Remingtons adapted to the French rifles, the Remington breech being preferred.

THE following professors of Cornell University have been elected: Rhetoric and Oratory, H B. Sprague, principal of State Normal School of Connecticut; General and Agricultural geology, Prof. C. Frederick Hart, of Vassar College; Botany and Horticulture, Prof. A. N. Prentiss, of Michigan Agricultural College; Director of Shops, John L. Morris, of Ovid. The University opens October 7th.

THE following is one of the many good things from Dicken's pen: "The first external revelation of the dry rot in men is a tendency to lurk and lounge; to be at street corners without intelligible reason; to be going anywhere when met; to be about many places rather than any; to do nothing tangible but to have an intention of performing a number of tangible duties to-morrow or the day after."

THE Sicilian Railway Company not long since bought, in Catania, for the purposes of its business, a house two stories high, formerly belonging to the Jesuits. The workmen, in demolishing the walls of the building, found a cavity, within which were three human skeletons, still having the decayed fragments of priests' cassocks clinging to them.

WE have seldom seen more sense compressed into less space, than is contained in the following sentence, by Josh Billings: "I am loudly in favor ov new things, but I am opposed to enny man, even wun ov our colored associates, thinkin' he has diskovered a new truth jest bekause he haz, for the fust time in his life, stumbled into an old one."

The codfish has been elevated to the dignity of oysters and strawberries, and is now canned for use. It is prepared by clearing it of skin and bone by desiccation. One Philadelphia concern puts up three tuns daily.

THE safe of the Adams Express Company, which was sunk with the steamer W. R. Carter in the Mississippi river about two years ago, has been recovered. It contained $230,000 in national currency, all of which has been regained without serious damage.

THE American Institute has decided to hold no Fair this year. The want of a suitable building is the reason.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office.

FOR THE WEEK ENDING SEPTEMBER 22, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

82,268.—REED FOR MELODEON.—Rogers A. Abbott (assignor to himself and Gustavus W. Ivalls), Worcester, Mass.
I claim the improved reed, as made with an arched head as and for the purposes specified.

82,269.—HEAD BLOCK.—Abel A. Adams, Felchville, assignor to Russel W. Pinney, and Forrest L. Pinney, Bridgewater, Vt.
I claim the combination of the sector, s, its adjustable stop, u, and hinged stop pawl, x, with the gear, o, its operating lever, p, working pawl, q, and spring, y, the same being applied to the bed, and to the shaft of the rack pinion of the main head block, substantially in manner and for the purpose or objects as set forth.

82,270.—STEAM SAFETY VALVE.—Edward H. Ashcroft, Lynn, Mass.
I claim the construction of the valve, b, with its alloy, t, with reference to its seat, s, as an article of manufacture, substantially as herein set forth.

82,271.—CLAMP FOR RAILROAD RAIL.—William B. Atkinson, Pittsburg, Pa. Antedated September 9, 1868.
I claim the T-headed bolt or pin, D, plate, C, and wedge or key, F, combined and applied to the securing of a guard-rail, substantially as herein set forth.

82,272.—PENCIL SHEATH.—Samuel Ayres, Danville, Ky.
I claim, 1st, The combination of the slotted funnel-shaped holder, A, spring, C, and friction roller, D, the perforated wings, E, and the adjustable protecting tube, G, having the perforate diaphragm, g2, all constructed and arranged as described, for the purpose specified.
2d, In combination with the slotted funnel-shaped holder, A, roller, D, and protecting tube, G, the adjustable stop, F, upon the pencil as herein described, for the purposes specified.
3d, The combination of the protecting tube, G, with the holder A, constructed substantially as herein shown and described, and for the purpose set forth.

82,273.—PRODUCTION OF GAS, AND ILLUMINATING STREET AND OTHER CARS.—Arthur Barbarin, New Orleans, La.
I claim 1st, The method of generating illuminating gas on railway or street cars, or other conveyances, by the use, in such conveyances, of one or more reservoirs or tanks of compressed air, operating in connection with a carbureting vessel and burners, for the consumption of the carbureted air, substantially in the manner herein set forth.
2d, A burner for carbureted air, the slit or opening in which for the discharge of said air is formed substantially as shown and described.

82,274.—HORSE YOKE.—Thomas J. Barnes, Cambridge, Ill.
I claim, 1st, Connecting the parts, A and B, of the yoke to the hames, F, by means of the clips, G, constructed and attached to said hames, substantially as herein shown and described.
2, Forming holes or slots in the ends of the parts, A and B, of the yoke, to adapt them to the clips, G, substantially as herein shown and described.
3d, Bending or curving the curved portions of the parts, A and B, downward, as they leave the clips, G, substantially as herein shown and described and for the purpose set forth.
4th, Beading or curving the straight portion of the part, A or B, which is below the other, at an angle of said part, and at the point where it leaves the clip, G, substantially as herein shown and described, and for the purpose set forth.
5th, Connecting the short chains, C, and equalizing bar, D, to the eyes of the parts, A and B, by means of hooks, substantially as herein shown and described, and for the purpose set forth.
6th, The single draft chain, E, attached to the center of the equalizing bar, D, when said chain is used between the horses, as and for the purpose specified.

82,275.—BURGLAR ALARM.—Henry P. Beardsley and Geo. Wilcox, Corunna, Mich.
We claim, 1st, The water cylinder, N, provided with the opening, O, and perforations P, in connection with the clock-work, C.
2d, The casing, R, provided with openings, S, when operating with the water chamber, substantially as described, for the purposes specified.
3d, The combination and arrangement of the bed plate, A, standard, B, cord or cords, V, loop, U, springs, L and M, rod J, cord, G, loop, I, lever, H, rock shaft, D, weighted lever, T, dog E, and catch, F, with the clock work, C, water cylinder, N, and casings, R and K, all operating in the manner specified, and for the purposes set forth.

82,276.—REGULATOR FOR STEAM-ENGINE.—Julien Francois Belleville, Paris, France.
I claim the arrangement, in the cylinder, F, provided with steam admission and discharging openings, as described, of the spindle, C, and annular spring disks, A, mounted upon the said spindle, and united or riveted together in the manner specified, and provided at the points where their outer and inner edges are in contact with a packing, B, as set forth.

82,277.—SPARK ARRESTER FOR STEAM GENERATOR.—Walter C. Benn (assignor to himself L. L. Baker, and R. Hamilton), San Francisco, Cal.
I claim, 1st, The stack or chimney, A, with the curve, a, as shown, and the water vessel, C, together with the supply and discharge pipes, b b and d, the whole constructed and arranged substantially as herein described.
2d, The secondary bonnet, D, and the annular water trough, E, as arranged, for more completely extinguishing the sparks, substantially as described.
3d, The conical vessel, C, and bonnet D, movable in the slides, c c, c c, for regulating the draft, the whole constructed and arranged substantially as herein described.

82,278.—MILLSTONE BALANCE.—Walter C Benn (assignor to himself, Livingston L. Baker, and Robert Hamilton, San Francisco, Cal.
I claim the combination of the adjustable weights, D D, and their ways, C C, together with the operating screws, E E, and the elevating screws, b, b, or an equivalent device, when used for balancing millstones, the whole constructed and arranged substantially as herein described.

82,279.—COMBINED PISTOL AND SWORD.—Charles E. Billings, Springfield, Mass.
I claim, 1st, The construction of the lower guard of the sword hilt, and the pistol barrel in one and the same piece, and pivoting the same to the extreme forward end of the handle, substantially as and for the purpose set forth.
2d, The combination of the main lock spring, C, of the pistol with the shank of the knife, when the former is secured in a slot in the latter, as and for the purpose described.
3d, The arrangement with the knife handle and pistol hammer, of the trigger lever, D, extending the length of the handle, and having a thumb trigger at its forward end, substantially as shown and described.

82,280.—CLOTHES DRYER.—Josiah B. Blood, Lynn, Mass. Antedated September 12, 1868.
I claim the combination of the strips, A B C D E F, forming the frames, in the manner and for the purpose substantially as above set forth.

82,281.—KNITTING MACHINE.—Benjamin Bollinger and George G. Nodle, New Berlin, Ohio.
We claim the spring, K N, constructed as described, in combination with a needle of a knitting machine, substantially in the manner and for the purpose herein specified.

82,282.—LAND MARKER.—Wesley L. Bower, Joliet, Ill.
I claim the combination of the swing seat, m, and upright frame, l, with the hinged frame, e, all arranged and operating as and for the purposes set forth.

82,283.—STEAM GENERATOR.—H. G. Brooks, New York city.
I claim, 1st, The arrangement, in the fire-box of a locomotive or other boiler, of perforated fire brick walls, extending upward divergingly from the contracted grate surface to the walls of the fire box, substantially as set forth.
2d, The arrangement, in the upper part or mouth of the combustion chamber or fire box, of arched or hollow perforated fire brick, or castings of fire clay, communicating with air conduits in the manner described, so that the atmospheric air received through such conduits may be highly heated within said brick or castings, and then discharged from the same into the combustion chamber at the point of contraction and concentration of the combustible gases evolved from the fuel in the fire box.
3d, The combination, with the perforated fire brick, of a water supply pipe, communicating with the boiler, and provided with a series of nozzles or sprayers, arranged partly within the perforations in the fire brick, substantially as set forth.

82,284.—PROJECTILE.—Charles F. Brown, Warren, R. I.
I claim, 1st, The tube, B, and plunger, C, arranged within the hollow projectile, A, the plunger serving to separate the powder in the shell from the fuse in the tube, while the shell is undisturbed in its motion, as specified.
2d, The wire, b, formed on the plunger, for the purpose of becoming heated by the ignited fuse, and for igniting the powder or other explosive matter in the shell, as soon as the latter strikes an obstacle as specified.
3d, The tube, B, fitted into the hollow shell, A, and provided with apertures, c, with a perforated plug, d, or its equivalent, and with a fuse, g, all arranged in combination with the plunger, C, which carries the wire, b, and all made and operating substantially as herein shown and described, for the purpose specified.
4th, The perforated cap, E, fitted over the rear end of the tube, B, substantially as herein shown and described.
5th, The combination of the shell, A, tube, B, plunger, C, and wire, b, with the case, D, cap, E, and apertures, K, all made, arranged, and operating substantially as and for the purpose herein shown and described.
6th, The rod, i, in combination with the tube, B, plunger, C, and wire, b, all made and operating substantially as herein shown and described.

82,285.—ROTARY STEAM ENGINE.—Arthur W. Browne, Brooklyn, N. Y., assignor to Charles B. Squire, New York city.
I claim, 1st, The arrangement of the abutment, E E', pressure chamber, C, and the cocks, D and D'.
2d, The pistons, G, when constructed as set forth.
3d, The construction of the segment, H H', forming the chamber through which the piston passes while being acted upon by the steam, as herein set forth.
4th, The arrangement in the shell of the rotary engine of the abutments, E E', pressure chamber, C, and segments, H H', substantially as set forth.

82,286.—MOP HEAD.—John D. Browne, Cincinnati, Ohio.
I claim the fixed jaw, A, having the grooves or recesses, c c, in the socket, B, in combination with the loose jaw, D d d, and nut, C, substantially as and for the purpose described.

82,287.—SASH PULLEY.—John D. Browne, Cincinnati, Ohio.
I claim the recessed lugs, a, of the face plate, A, in combination with the holding pins or rivets of the case plate, B, in the manner substantially as described, and for the purpose set forth.

82,288.—HAY RACK.—Stephen Brownell, Irving, N. Y.
I claim the combination of the separate bed plates, A, with projecting pins, a a, secured thereto, separate angular cross pieces, B B, with projecting pins, b b, secured thereto, separate side rails, C, and separate center board, D, the parts being built up one above another, and connected together, and adapted to operate as herein represented and described.

82,289.—SAW.—Benj. F. Burgess, Norvell, Mich.
I claim making a saw that is to cut one way only, with the cutting teeth, B and C, and the clearing teeth, D, forward of each section, and the space, E, when constructed and all arranged as specified.

82,290.—PRUNING AND HEDGE SHEARS.—Lawrence Campbell, Marengo, Mich.
I claim the cutting blades, C and J, the latter provided with cutting hook, K, when constructed as described, and operating in combination with the handles, B and E, and connecting arm, F, substantially as and for the purposes set forth.

82,291.—BELT BUCKLE.—F. Clausen, San Francisco, Cal.
I claim, in a belt buckle, the beveled projecting tip, B, in combination with the slotted bar, C, rotating on its axis, as shown, and the operating lever, b, the whole constructed and arranged substantially as and for the purpose described.

82,292.—HORSE RAKE.—Wm. H. Cook, Bridgehampton, N. Y.
I claim the combination of the standard, H, lever, I, and perforated shoe, K, with the rake head, F G, substantially as herein shown and described, and for the purpose set forth.

82,293.—POST HOLE BORER.—John Cothron (assignor to himself and D. J. Mayes), Illiopolis, Ill.
I claim the shaft, k, knife, M, bels, N, with its buckets, gears, o m p, and their shafts, and frame to which they are attached, wheel, a, windlass, b, with its connecting rope, g, frames, E and A, of a post hole borer, all constructed arranged, and operated substantially as and for the purpose specified.

82,294.—DOOR FOR FURNACE.—Wm. W. Crane, Philadelphia, Pa.
I claim the door plate, B, rim or elevation, A, and the door, C, when constructed and arranged substantially as and for the purpose shown and described.

82,295.—WINDLASS.—Augustus Day, Detroit, Mich. Antedated Sept. 16, 1868.
I claim, 1st, the friction bands, G, in conjunction with the pawls, F, the rod hereof as described, and the cylinder, B, when operating substantially as and for the purposes set forth.
2d, The dogs, H, rod, I, and counterpoise, J, when arranged and operating substantially as herein described.
3d, The combination and arrangement of the above mentioned parts with the frame, A, the cylinder, B, the sockets, C, the handles or levers, D, the ratchets, E, and the chain or rope, K, when constructed and operating substantially as herein specified, set forth and described.

82,296.—MACHINE FOR CONVERTING RECIPROCATING INTO ROTARY MOTION.—Jacob G. Deshler, Allentown, Pa.
I claim the combination, in a man power machine, of the vibrating footboard, A, the trunnions of which have rectilinear bearings, substantially as described, with the pitman beams, B, pitman, D, and crank shaft, b, all arranged and combined substantially as shown and described for the purpose set forth.

82,297.—LANTERN.—Anthony M. Duburn, Chicago, Ill.
I claim, 1st, The sheet metal rim, A, when formed in the shape shown and described, and for the purpose herein set forth.
2d, The wire ring, a, when used as a stiffening, in combination with the sheet metal rim, A, and corrugations or loops, c c c c c c.

82,298.—BEE HIVE.—George Eason, Lyons, N. Y.
I claim, 1st, The box, A, provided with the porch, B, swinging side, E, comb frames, C, and division board, D, all as and for the purpose set forth.
2d, The arrangement of the ventilating passages, N, L, and b, the latter being covered with a wire screen, as and for the purpose described.

82,299.—HAND SAW.—James E. Emerson, Trenton, N. J.
I claim a shouldered and headed screw bolt for holding a saw to its handle, so that said screw bolt may be held from turning under the action of the nut, and constructed to operate as and for the purpose herein described and represented.

82,300.—CAR SPRING.—James W Evans, New York city.
I claim the spiral spring, A, the elastic tube, B, and the closed air chamber confining the column of air, D, constructed and combined substantially as and for the purposes specified.

82,301.—CONCRETE BLOCK MAKING MACHINE.—Owen V. Evans (assignor to himself and James Reynolds), Ripley, Ohio.
I claim, 1st, The combination with the table, B, of the disk, O, and slide, F, oscillating toothed segment, M, pinion, P, and rack, Q, substantially as and for the purpose described.
2d, The combination of the mechanism for operating the sliding pistons, D, with the mechanism for rotating the table, B, when the same are arranged to operate relatively to each other substantially as and for the purpose described.

82,302.—WHIP GOAD.—Frederick Flanders, Franklin, N. H.
I claim the whip stock, metallic tip, B, hollow screw, C, spur, c, and screw D, when combined and arranged as and for the purpose described.

82,303.—MACHINE FOR FELLING TREES.—M. R. Fory, New York city.
I claim the frame, B, carrying a series of permanent and a series of detachable augers, and constructed and adapted to the truck, A, as and for the purpose described.

82,304.—BABY WALKER.—Frederick A. Geisler, Bristol, R. I.
I claim the oscillating yoke, G, made in two parts, a b, the former pivoted by the bolt, d, to the curved arm, F, and provided with a socket, in which the shank of the arm, b, is adjusted by the set screw, c, as herein described, for the purpose specified.

82,305.—BEDSTEAD FASTENING.—Chas. M. Gilbert, Philadelphia, Pa.
I claim the combination of a key or wedge, 2, with the bolt, 1, tube or barrel, 5, spring, 3, slotted rail, 4, and post, 6, as hereinabove described.

82,306.—KNIFE FOR CUTTING GREEN CORN FROM THE COB.—Washington L. Gilroy, Philadelphia, Pa.
I claim, 1st, A green corn knife for table use, having a blade, A, provided with a series of transverse cutting edges, a' a', substantially as described.
2d, In combination with a blade, A, and cutters, a' a', arranged as described, the bar, B, arranged to operate substantially as and for the purpose described.

82,307.—WIND WHEEL.—B. H. Goodale, Newburyport, Mass.
I claim the combination, with the hinged wings, of means, substantially as described, for folding the sails, as and for the purpose described.

82,308.—MAT.—John M. Groh, Benevola, Md.
I claim the mat constructed as described, consisting of the wooden block, A, having an interior groove adapted to receive the filled bars through the notch, a, in the flange of said block, as herein described, for the purpose specified.

82,309.—MANUFACTURE OF BROMINE FROM BITTERN.—Gustav A. Hagemann, Natrona, Pa.
I claim, 1st, The use, in the manufacture of bromine, of a sandstone trough or vessels, furnished with a bore, C, for the introduction of steam, so as to dispense with the insertion into the liquor of metallic pipes.
2d, The use, in the process of extracting bromine from bittern or mother water, of naked steam, introduced into the body of the liquor under treatment, for the purpose of combining the mechanical action of the steam with the physical effects of its heat, to produce the desired effect.

82,310.—TRUNK CASTER.—J. W. C. Haskell and Joseph E. Haskell, Chicago, Ill. Antedated Sept. 11, 1868.
We claim the plate, A a, provided with the hole, d, for the projection of a caster ball, and made angular, so as to form a guard for the trunk corners, in combination with the plate, b c, and ball, c, substantially as specified.

82,311.—RANGE.—John P. Hayes, Philadelphia, Pa. Antedated Sept. 8, 1868.
I claim, 1st, The construction and arrangement of the tunnel, B, in its relation to the cylinder, A, and the air heating chamber, C, whereby the air for the combustion of the fuel in the cylinder can at any time be drawn from the air heating chamber, C, substantially as and for the purposes described.
2d, The construction and arrangement in relation to each other of the tunnel, B, the detachable sliding grate, E, and the adjustable opening, c'', in the plate, c', into the ash pit, D, substantially as and for the purposes described.
3d, The construction and arrangement of the air heating flue, F, in relation to the cylinder, A, the air heating chamber, C, the cold air space, M, and the oven, G, substantially as and for the purpose described.

82,312.—HENS' NEST.—B. F. Hayward, Nebraska City, Nebraska.
I claim the nest box, C, pivoted bottom board, D, link, b, levers, E, and grating, d, all constructed and operating substantially as described, within a box, A, all as set forth.

82,313.—FURNACE FOR WORKING IRON.—John Heatley, Etna, Pa.
I claim, 1st, an air chamber, g, under the bottom plate of a heating or puddling or boiling furnace, provided with such communications as to receive air from without, heat it, and discharge it into the furnace, fire space, or ash pit, substantially as and for the purposes hereinbefore set forth.
2d, The use of two or more dampers, h i, so arranged relatively to the air chamber, g, and lower grate, c, as to admit heated air either above or below such grate, c, or both above and below, substantially as and for the purpose above expressed.
3d, A perforated plate or finely divided grate, c, at any desirable point below the fire grate, a, and above the bottom of the ash pit, arranged and used substantially as and for the purposes hereinbefore set forth.
4th, The series of flues, e e', extending along the face of or through the lining or walls of a heating, puddling, or boiling furnace, arranged and used substantially as and for the purposes described.
5th, A fire box, of covering the tap hole, n, of a furnace, constructed and operated substantially in the manner and for the purposes hereinbefore set forth.

82,314.—CENTRIFUGAL MACHINE.—S. S. Hepworth, Boston, Mass.
I claim, 1st, The suspension of the shaft, B, and curb, A, of a centrifugal machine, from a sleeve, a, or other equivalent device, substantially as shown and described, and for the purposes set forth.
2d, Supporting the sleeve, a, by the spherical surfaces, a' and b', or surfaces approximating to a spherical surface, for the purpose of supporting and permitting the vibration or gyration of the basket shaft, B, of a centrifugal machine, all as set forth.
3d, Supporting the sleeve, l, or its equivalent, by a bolt, d, or the equivalent thereof, substantially as shown and described, when these said parts conduce to the support of the basket shaft, B, of a centrifugal machine, all as set forth.
4th, The bolt, d, and cam link, h, or their equivalent, in combination with the sleeve, l and m, all substantially as shown and described, and for the purpose of indirectly supporting the weight of the basket shaft, B, of a centrifugal machine, and elevating the said shaft to produce the contact of the breaking surfaces, c and m', all as set forth.
5th, Employing the pulley, C, and lower end of the sleeve, m, as friction surfaces, for the purpose of retarding and stopping the revolution of the basket shaft, B, of a centrifugal machine, all as set forth.
6th, Making the surfaces, c and m', spherical, for the purpose of permitting the gyration of the basket shaft, B, all substantially as shown and described.
7th, Two or more rods, E, or the equivalent thereof, substantially as shown and described, in combination with arms, G, and curb, A, for the purpose of supporting the curb, A, and thereby enabling it to maintain its concentricity with the shaft, B, all as set forth.
8th, The gudgeon, b, affixed rigidly to the cross bar, f, or other equivalent bottom part of the curb, A, substantially as shown and described, in combination with a roller, r, and cup, J, or its equivalent, as and for the purpose set forth.
9th, The employment of an elastic roller, r, substantially as shown and described, in combination with the fixed gudgeon, b, or other equivalent device, and cup J, or its equivalent, all as and for the purpose set forth.

82,315.—PROCESS OF EXTRACTING PRECIOUS METALS FROM ORES, ETC.—George F. B Hill, Virginia city, Nevada.
I claim the ingredients above enumerated, mixed or compounded and added to the ores, pulp, tailings and slimes, in about the proportions herein specified for the purpose set forth.

82,316.—HAY RAKER AND LOADER.—William H. Hiteshew, Perrysburg, Ind.
I claim the teeth, D, constructed with arms, d', and wheels, E, and operating substantially as herein shown and described, and for the purpose set forth.

82,317.—ARRANGEMENT OF MECHANISM FOR OPERATING PUNCHES.—Luther W. Holmes, Grand Ledge, Mich.

I claim the construction and arrangement of frame or standard, A, with its guide pieces, D and E, sliding stirrup, C, with sliding pin, G, cam lever, L H, roller, I, and bed plate, in the manner as shown and described, and for the purpose set forth.

82,318.—STILL.—Nicholas Hotz, Green Point, N. Y.

I claim, 1st, The process, substantially as herein described, of effecting continuous redistillation within a still, through, it may be, the action of a single heater or generator, by causing the vapor rising from the one distillation to be condensed within the mash through a worm or worms, or their equivalents arranged therein, and afterward returned for distillation over again, thus separating the more from the less highly volatile portions, and at the same time heating the mash.

2d, The combination of the mash receiving chamber or vessel, A, with the mash vessels, D G, and H, and pipes, C F, and J, provided with suitable plugs or valves, for passage of the mash to each of the lower vessels in succession, substantially as specified.

3d, The combination, with any desired number of mash chambers or vessels, A D and G, and mash receiver or generator, H, of two or more distilling chambers or separators, N K, arranged to connect by pipes with worms or other condensing devices, located in the mash vessels, A D and G, for operation, essentially as described.

4th, The connection of the distilling vessels or separators, N and K, by means of an overflow pipe or pipes, n and r, substantially as and for the purpose or purposes set forth.

5th, The combination, with the mash boiling vessel or generator, H, of the column, L, arranged to connect with a worm, or its equivalent, in an upper mash vessel, essentially as herein set forth.

82,319.—VELOCIPEDE.—David Hunt, Jr., Worcester, Mass.

I claim 1st, The combination of the seat, G, with the braces or standards, H H, and the crank or supporting shaft, A, substantially as and for the purposes set forth.

2d, The peculiarly constructed frame, D, in combination with the cap, E, axle, A, and chair, G, substantially as and for the purposes set forth.

3d, The combination of the standards, H H, and piece, P, having ears, a a, with the chair seat, G, and frame, D, substantially as and for the purposes set forth.

4th, A velocipede, the parts of which are constructed and combined together, substantially as shown and described.

82,320.—WOOD PAVEMENT.—David Woodwell Hunt, San Francisco, Cal.

I claim a pavement, the blocks of which are secured in position by means of cement run into horizontal grooves or recesses cut around each block, the blocks and grooves being formed and arranged substantially as described.

82,321.—OIL CUP.—Edwin Hurd, Virginia city, Nevada.

I claim the arrangement of the frame, E, the hollow cylinder, a, pivoted within it, and having passages for the reception of oil, for the escape of air, and for the delivery of the oil through the pivots on which it turns, substantially as described.

82,322.—HEATING APPARATUS.—J. Fienzi Jenness, Norwich, Conn.

I claim, 1st, The steam space or spaces, D, between the several chambers and dishes, B B, substantially as described, and for the purposes set forth.

2d, The vessel or table, A, chambers, C, and space, D, with induction and eduction pipes, pans, B, and covers, O, when combined and arranged substantially as described, and for the purposes set forth.

82,323.—NECK TIE.—Asa Johnson, Brooklyn, N. Y. Antedated Sept. 11, 1868.

I claim a neck tie formed of wire cloth or gauze, substantially as described, as a new article of manufacture.

82,324.—CAR BRAKE.—G. N. Jones, Oshkosh, Wis.

I claim, 1st, The combination, with the friction pulleys, of the shaft, I, connected from car to car, as described, and slides, L, connected to the sliding pulleys by a cord and lever, for actuating them, substantially as and for the purpose described.

2d, The combination of the slides, L, actuating shaft, and means for allowing the slides to pass out of action, with the shafts, when the brakes are brought into action, substantially as and for the purposes described.

3d, The combination, with the slide, L, of the collar, P, lever a, slide, U, and catches, C and C', substantially as and for the purpose described.

82,325.—FIRE ESCAPE.—J. L. Jurgens, New Orleans, La.

I claim the carriage, A, provided with the adjustable grooved pulleys, B, and operating shaft, D, in combination with the inclined ways, E E, substantially as and for the purpose described.

82,326.—HYDRANT.—Wm. Kearney, Union Township, N. J.

I claim the arrangement and operation, in the case, A, of the sliding disk valve, C, perforated at S, and the sliding waste pipe, J, as herein shown and described.

82,327.—STOVE.—J. H. Keyser, New York city.

I claim, 1st, The combination of sections, A and B, the latter constituting the fire chamber, and the former an illuminating and heat retaining top section for B, substantially as described.

2d, The construction of section, A, with an internal downwardly-contracted wall, c, with inclined illuminating window, d, and with downwardly-contracted base portion, a, said parts being adapted to fit upon a fire-pot section, B, substantially as described.

82,328.—HEAD BLOCK.—W. A. L. Kirk, Hamilton, Ohio.

I claim the index roller, D, constructed substantially as herein shown and described, in combination with the head block, B C, of a saw mill, as and for the purpose set forth.

82,329.—CAR-BRAKE ATTACHMENT.—J. Kirkley, Chicago, Ill., assignor to himself and Hugh Gray.

I claim, 1st, A guard box, F, adapted for inclosing the pawl and ratchet of a brake standard, substantially as described.

2d, The combination of a treadle, E, pawl, H, and ratchet wheel, D, substantially as described.

3d, Fitting the treadle, E, to the guard box, F, substantially as herein described.

4th, A spring latch, g2, a pawl, H, ratchet wheel, D, a treadle, E, and means, substantially as described, for releasing the latch, g2, by the act of turning said ratchet wheel.

82,330.—SKIMMER FOR SORGHUM EVAPORATOR.—J. B. Lewis, Lincoln, Ohio.

I claim 1st, The automatic skimmer lid, B, formed by attaching the perforated metallic plate, b1, constructed as described, and having pipes, b2, inserted in it to the wooden frame of said lid, substantially as and for the purpose set forth.

2d, The combination of the automatic skimmer lid, B, constructed as described, with an ordinary evaporating pan, A, substantially as and for the purpose set forth.

82,331.—PISTON-ROD PACKING.—Samuel Lockard, Lagrange, Indiana.

I claim the arrangement, within the chamber, E, of the conical split packing rings, e f, flanged follower, g, and spring, d, as herein shown and described.

82,332.—GOVERNOR FOR STEAM ENGINE.—J. A. Lynch and R. K. Huntoon, Boston, Mass.

We claim the combination of the hydraulic governor and a mechanism, substantially as explained, for effecting the closing of the main valve of the engine, in case of breakage of the driving belt of the governor, such mechanism consisting principally or in substance, not merely of the auxiliary arm, L', the catch, m, and chain, N', but also of the slide or disengager, n, the spring, r, lever catch, s, and the arm, z, provided with the bolt, c2, or such bolt and the spring, b2, the whole being applied to the said arm, K1, the governor case, and the weight, W, substantially in manner and so as to operate as specified.

Also, the combination of the hydraulic governor and the relay or reinforcing engine applied to the main valve, S, of the induction pipe of a steam engine, as set forth, with the described mechanism for effecting the closing of the said main valve in case of breakage of the driving belt of the governor.

82,333.—COFFIN.—M. R. Margerum, Trenton, N. J. Antedated Sept. 9, 1868.

I claim the forming and constructing the side and rounded head of wooden coffins with two entire pieces of wood, and bending the same so as to form the coffin, substantially as above described and herein set forth.

82,334.—LAMP BURNER.—J. P. McGee, Trenton, Tenn.

I claim the burner, B, having its lower end slitted to form a series of springs g, provided with a head, b, which is adapted to press in the springs when the burner is inserted in the cylinder, I, the expansion of said springs forcing the head under the lower edge of the cylinder, when it has cleared the same, thereby holding the burner in place, as herein shown and described.

82,335.—PINKING TOOL.—John L. McIntosh, Boston, Mass., assignor to himself, James Blenkinsop, and Wm. H. Vaughn. Antedated Sept. 7, 1868.

I claim a machine or device for pinking leather, cloth, etc., consisting of a lever, armed at one end with a tool and a tool-bearing socket, the latter so arranged as that the pinking tool may be changed at pleasure, in combination with the revolving block, when the same is supported and made adjustable by a spring beneath, all substantially as and for the purpose described.

82,336.—GATE.—A. W. Meek, Waterloo City, Ind.

I claim the rack, E, pulleys d and e, and weight, I, in combination with the gate, G, substantially as and for the purpose described.

82,337.—SIDE SADDLE TREE.—John C. Miller, Danville, Ky.

I claim, 1st, As a new article of manufacture, of a side saddle tree, in which the front or pommel, c', is formed at the same time and of a similar material to the body of the tree, substantially as and for the purpose specified.

2d, The combined off horn and pommel, C, formed from wood with the grain lengthwise, by cutting, steaming, and bending, and attached, substantially in the manner described.

82,338.—ROW LOCK.—P. H. Mills, Green's Landing, Me.

I claim the row lock, D, and roller, C, constructed and operating in combination with each other, substantially as herein shown and described, and for the purpose set forth.

82,339.—GRAIN STORER.—R. M. Mitchell, Fort Atkinson, Wis.

I claim, 1st, The arrangement of the bins, A, in a vertical column, said bins being connected by means of a tube, B, provided with receiving and discharging orifices, F F, respectively, substantially as described for the purpose specified.

2d, The tube, B, passing through the series of bins, A, and provided with receiving and discharging orifices, communicating with each bin, said orifices being provided with valves which are adapted to be operated by means of cords, D, or their equivalents, in the manner and for the purpose substantially as herein set forth.

82,340.—SPRING FOR WAGON SEAT.—John H. Nale and John W. Rogers, Decatur, Ill.

We claim a spring seat for wagons, composed of reversible cross spring braces, supported by and in turn supporting the seat by a bridge piece at or near their points of crossing, substantially as herein described and represented.

82,341.—CLOTHES PRESS.—J. S. Nicholson, Anamosa, Iowa.

I claim, in a clothes press, the combination and arrangement of the frames, A and B, uprights, 1 and 2, cross piece, 3, shelf, 4, the coverings, 5 and j, the arms, a b and c, the bars, e f and g, the rest, h, as and for the purpose specified.

82,342.—VALVE GEAR FOR OSCILLATING ENGINE.—Charles H. Overton and D. B. Overton, Dover, N. J.

We claim the arrangement of the hoop, G, reciprocating plate, E, and guide plate, d, with reference to the trunnion, a, of an oscillating cylinder, substantially as shown and described.

82,343.—WAGON.—Alvah Pate and Edgar Wilber Pate, Nankin, Mich.

We claim the construction of a wagon or carriage, combining the springs, D, body, E, semi-circular frame, H, roller, I, hanger, J, circle, K, "fifth wheel", L, and king bolt, M, or their equivalents, with any suitable axles, B, and wheels, A, when arranged, connected, and operating substantially as and for the purposes herein set forth and shown.

82,344.—WAGON BRAKE.—David Philips, Cordova, Ill.

I claim a brake, consisting of the shaft, D, having rub blocks, attached, held in by the rods, F, and operated by the lever, C and H, connected by the rod, G, substantially as described.

82,345.—HORSE RAKE.—C. H. Ponge, Perry, Mo.

I claim the combination of the staples, e', and rings, e, with the rake, a b c d, and the flexible draft chains or cores or straps, g g, substantially in the manner and for the purpose described.

82,346.—MACHINE FOR CUTTING SCREW THREADS.—Denis Poulot, Paris, France.

I claim, 1st, The arrangement herein described, of the perforated rotating and sliding jaws, D, plate, C, and hollow shaft, B, with mechanism for rotating the same.

2d, In combination with the above specified mechanism, the guide rods, 1, and sliding die carriage, H, constructed and operating substantially as described.

3d, The arrangement, in the die carriage, of the cutting dies, k, and sliding blocks, l, in combination with the screws, gearing shaft, and hand wheel, for operating the same, so that said dies can be moved simultaneously, either toward or away from each other, as set forth.

4th, The inclined and projecting trough or receptacle, located beneath the cutting mechanism, and arranged to receive the shavings or chips and lubricating oil, and to conduct the latter to a separate receptacle, as herein shown and described.

82,347.—MACHINE FOR MOLDING CANDY.—E. K. Powers, Grand Rapids, Mich.

I claim, 1st, The movable molds, B, constructed each of a bottom piece, a, and a vertical side strip, b, sharpened at its upper edge, in combination with the roller, G, and the mold's receptacle, A, all of which may be constructed of wood or any other material, and arranged substantially in the manner as and for the purpose set forth.

2d, The press, composed of the bars, K K', arranged and operated substantially as shown, in combination with the plunger or follower, L, box, M, the slide, N, and spring stop, O, all arranged for joint operation, substantially in the manner as and for the purpose specified.

82,348.—KNITTING MACHINE.—J. W. Rist (assignor to himself and Ira A. Hebbard), Rochester, N. Y. Antedated September 9, 1868.

I claim, 1st, The needle bed, composed of the division plates, d, and spacing plates, t, when connected together, substantially in the manner and for the purposes herein shown and described.

2d, The gib, G, in combination with the bed, A', and removable needle bed, as and for the purposes set forth.

3d, The arrangement of the locking spring, N, constructed as described, attached rigidly to the lock plate, P, and operating upon the V-shaped cam, M, on the reversing plate, H, substantially as and for the purposes set forth.

4th, The arrangement of the cam, Q, with the pivoted lever, R, and stud, g, of the wing cam, D, on that end of the lock, substantially in the manner and for the purposes herein shown and described.

5th, The arranged of the cam, O, upon the reversing slide, in connection with the stud, g, of the wing cam, the parts all operating substantially in the manner and for the purposes shown and described.

6th, The reactionary spring, l, in combination with the stud, g, and wing cam, D, substantially as shown and described and for the purposes set forth.

7th, The combination with lock plate, P, of the needle adjuster, T, constructed, arranged, and operating substantially in the manner and for the purposes set forth.

8th, The combination with the lock plate, P, of the cam and needle guides or adjusters, E, substantially in the manner and for the purposes set forth.

9th, In combination with the wing cams, D, and their studs, g, the cams, O and Q, and latch, R, or their equivalents, whereby said cams, D, are moved upward simultaneously with the closing of the V-cam, C, for the purposes described.

10th, The combination of the plates, p, and studs, g, with the set nut, B, index hand, y, and scale, s', for the purposes set forth.

11th, In combination with the scale, s', for gazing the tension or length of the loop, the pivoted lever index, y, arranged and operating substantially as and for the purposes shown and described.

12th, The pivoted yarn carrier, Y, in combination with the friction traveler q, and the rod, W, all constructed, arranged, and operating as shown and described.

13th, The yarn carrier or guide, Y, slotted as shown and described and for the purposes set forth.

82,349.—FEMALE SYRINGE BED PAN.—Alvah Rittenhouse, M. D., Philadelphia, Pa.

I claim, 1st, The bed pan or vessel, J, capsular vulva, H, right angle suction tube, K, substantially as set forth.

2d, The vaginal extension tube, N O, metallic valve tube, P, right angle suction tube, K, rubber bulb, R, vessel, J, capsular vulva, H, strainer, L, all combined and arranged substantially in the manner and for the purpose as herein set forth and described.

82,350.—TRACK LAYING MACHINE FOR RAILROADS.—Wm. D. Robertson, San Francisco, Cal.

I claim, 1st, As a new application to construction trains, for supplying power to carry forward from the rear car to the place of deposit, the rails and ties, the engines, a a, mounted on the central car, substantially as described.

2d, The shaft, f, with the screw, g, actuating the trucks, b b, by the beveled gear, k' l', or their equivalents, substantially as described.

3d, The pulley, u, on the rear truck axle of the engine, for driving the friction rollers which carry the ties to the incline trough beneath the boiler of the engine, substantially as described.

4th, The friction rollers, t and u, in combination with the channel or trough v, substantially as and for the purpose specified.

5th, The pulleys, g, and the belts, w and w'', or equivalent devices, for actuating the cutters, substantially as described.

6th, Carrying the rails forward at each side of the boiler, and lowering them to the road bed, by the davits, A A, substantially as described.

7th, The rollers, q q, r r's s' s'' s''', the endless chains, p p', or equivalent device, for pressing down and holding the ties while the cutters trim them, substantially as described.

8th, The cutters, v' v'', for leveling and trimming the ties to receive the rails, constructed and operating substantially as described.

82,351.—MITER BOX.—Clark Robinson, Fox Lake, Wis.

I claim the plates, B C D, in combination with the frames, J J, guides, H H, having racks, F F, standards, L O, and pinion, G, the whole being constructed and arranged substantially as and for the purpose herein specified.

82,352.—CARPET BAG.—Anthony J. Robrecht, Newark, N. J.

I claim, 1st, The combination of one or more partitions with a traveling bag, valise, or trunk, produced by means of hooks and eyes, constructed to be employed in the manner and for the purpose specified.

2d, The combination of the metallic band, f, with the partition, e, and also the combination of said band with hooks or eyes, employed in the manner and for the purpose specified.

82,353.—MOLD FOR CASTING SLEIGH SHOES.—N. W. Russell, Cedar Falls, Iowa.

I claim, 1st, The sand flask or cope, A, and metallic mold section, B, constructed substantially as described, when used in combination with each other for the production of sleigh shoes, as set forth.

2d, The covering plates, J, in combination with the channeled metal section, B, and sand cope, A, substantially in the manner and for the purpose described.

82,354.—DEVICE FOR HOLDING CUT NAILS WHILE BEING HEADED.—Dennis Savery, Wheeling, W. Va.

I claim the arrangement of the lever, C, tappet, a, spring, D, plate, b, pad, e, cam, B, and shaft, A, in the manner and for the purpose specified.

82,355.—CORK PULLER.—Geo. W. Schermerhorn, East Livingston, Me.

I claim the instrument for removing corks from bottles, consisting of the handle, A, having the stem, B, and spring loop, D, at right angles to each other, and provided respectively with the sliding disks, C and E, all constructed and arranged to operate as described, whereby the cork is first pushed into the bottle by the stem, B, and afterward withdrawn by the loop, D, the disks, C E, in both operations serving to prevent the contents of the bottle from spattering out, as herein shown and described.

82,356.—CHURN.—Jacob Shaw and W. A. Shaw, Hinkley, Ohio.

We claim, 1st, So hanging a rectangular or nearly rectangular churn box or case that its axis of rotation shall be diagonal to its sides, in the manner and for the purpose substantially as set forth.

2d, The curved inclined rods and cross bar, in combination with the cap and churn, substantially as and for the purpose set forth.

3d, The hollow journal and valve in combination with the churn, arranged as and for the purpose substantially as herein specified.

82,357.—AUTOMATIC BOILER FEEDER.—Edwin Sheppard, Philadelphia, Pa.

I claim an automatic boiler feeder consisting of a cylinder, B, with its float, D, cylinder, F, with its pistons, l l', operated by the float, D, and cylinder, G, with its piston, m', the cylinder, F, communicating with the cylinder G, and the cylinder, B, with the cylinder, F, and the whole being arranged and applied to a steam boiler to regulate the flow of water to the same, substantially as described.

82,358.—FIRE ESCAPE LADDER.—George Skinner, Brooklyn, N. Y.

I claim, 1st, The peculiar arrangement and combination of the pivoted frame, K, caster wheel, M, rope or chain, O, and shaft, P, with each other and with the ladder, C, axle, B, and wheels, A, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the frame, D, and leg, d3, with the ladder, C, axle, B, and wheels, A, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the extension cross bar, E and e' e', with the ladder C, axle, B, and wheels, A, substantially as herein shown and described, and for the purpose set forth.

82,359.—CARBURETER.—Henry Slatter, Covington, Ky.

I claim, 1st, The arrangement of the water tanks, A and B, principal and auxiliary receivers, C and D, pipes, F H, and R, and tank, E, for the purpose set forth.

2d, The tank, E, adapted to contain both water and gasoline, and provided with the pipes, R H K, and M, and cocks, L L', as and for the purpose designated.

3d, In combination with the subject matter of claims, 1 and 2, the auxiliary carbureting chamber, O, or its equivalent.

82,360.—FOLDING TABLE.—William Smith, Cincinnati, Ohio.

I claim the combination, substantially as described, of the table, A, hinged frames, a B C D E, legs, F, hinged braces, G g d d' e' e', slides, H, under cut grooves, I I, stops, J, and spring bolts or catches, K, or their mechanical equivalents, for the object explained.

82,361.—HORSE COLLAR.—J. A. Sutherland, Elmwood, Ill.

I claim a horse collar, made of wood, when constructed substantially as above described.

82,362.—QUARTZ MILL.—Samuel Swesey, Malta, Ohio.

I claim, 1st, Suspending the stone, C, above the bed stone by means of the swiveled connections, F, and screws, b, in combination with the shaft, D, and stone, C, for the purpose of adjusting the grinding face of the stone, C, parallel to the grinding face of the bed stone, B, as herein shown and described for the purpose specified.

2d, The arrangement of the hopper, K, upon the yoke, E, whereby said hopper is revolved with the stone, C, as herein shown and described, for the purpose specified.

82,363.—BEEHIVE.—James Tallman, Clayton, Ill.

I claim, 1st, The arrangement and combination of a series of hives, provided with inclined bottoms, and resting on inclined bars, a, within a frame, in such a manner that the several hives may be made to communicate with or cut off from each, as may be desired, substantially as shown and described.

2d, The house, composed of the frame, A, and box, C, the latter being provided with doors, f, and with a lid or detachable top, F, when said house, thus constructed, is used in connection with a plurality of hives, B, adapted to the house or frame, in the manner substantially as and for the purpose set forth.

82,364.—SWEATS FOR HATS.—George W. Thompson, Brooklyn, N. Y.

I claim, as a new article of manufacture, a sweat band for hats formed of paper coated with japan or other water proof compound, and finished by embossing, substantially as described.

82,365.—REFRIGERATOR AND SIDEBOARD.—John A. Thompson, Auburn, N. Y.

I claim the construction of refrigerators and household preservatories of anglewood, skeleton frames, with their entire walls of trunk board, or its equivalent, filled with a concrete of plaster of Paris and granulated carbon, or other suitable material securing the same effects, all as specified and set forth.

82,366.—SEWING-MACHINE.—Jeptha A. Wagner, N. Y. city.

I claim, 1st, The feeding device, J, furnished with points on each side of an open slot, and a point or points in range with said slots, the said feeding points being applied, arranged, and operating substantially as described.

2d, The combination of the bridge, u, plate, I, and feeding device, J t t1, the said bridge being slotted, and the feeding device being forked and furnished with central and side points, substantially as and for the purpose described.

3d, The bridge, u, when slotted and provided with a forked or V-shape at one end, and a bevel and shoulder at the other end, in combination with the recessed removable plate, I, substantially as shown, and so that by one screw the bridge is confined in position.

4th, The bridge, u, constructed as shown in figs. 13 and 14, for the purpose described.

5th, The combination of the looper, H, the feed lever, J, with its central and lateral feeding points, slotted bridge, triple slotted presser foot, and upper needle, the said parts being constructed and arranged as described, and operated by a cam pulley, constructed as described.

6th, The cam pulleys, E F, constructed and arranged as described, in combination with the levers, E1 F1, rod, K, looper, H, looper guide, lever, p, C C6, needle, c, feed arm, J, bridge, u, and presser foot, V, all constructed and arranged and operating as described.

7th, The arrangement of a front elastic support, a2', for the cloth plate, B, forward of and centrally between the two rear hinging elastic supports, a2 a2, substantially in the manner and for the purpose described.

8th, The rear elastic sleeve bearings, a2, fitted in the hinging studs, a1, in combination with the hollow bearing boxes, a7, formed in the cloth plate, B, in the manner described.

9th, The gimbal joint, g, with the levers, E1 F1, applied to it, as shown in fig. 15, in combination with the feeding arm, J, looper guide, p, and the looper or lower needle, H, all constructed, arranged, and operating as described.

10th, The cloth plate, B, cast with a horizontal portion forward of the axis of the needle arm, C, and with a semicircular portion, B1, in rear of the horizontal portion, and also with a bracket, B2, and hollow bearing boxes, a7, all substantially in the manner shown and described, and for the purpose set forth.

11th, The slotted cloth presser, V, in combination with the elevated bridge, u, and feeding points working on both sides of said bridge, substantially as described.

82,367.—HAMES AND STRAP FASTENER.—John B. Waterman, Summit, Mich.

I claim the arrangement, in a hames fastener, constructed as herein described, of the latch, D, having a forked end, E, and operating in combination with the spring, C, and ratchet bar, F, all constructed and operating as herein described and shown.

82,368.—LUBRICATOR.—G. Waters, Cincinnati, Ohio.

I claim a lubricator, constructed with a graduating screw or plug, in which is formed a gradually tapering slot or groove for regulating and controlling the discharge of oil, as described.

82,369.—CORN HUSKER.—Samuel Wesson, Worcester, Mass.

I claim, 1st, The hinged guard or separating plate, Z, in combination with the separating roll, X' and bars, V, substantially as and for the purposes stated.

2d, The combination, with the guard or hinged separating plate, Z, of the adjusting screws, 12 12, and stands, 14 14, as and for the purposes set forth.

3d, The combination of the shield, 15, with separating roll, X, and bars, V, substantially as and for the purposes set forth.

4th, The combination, with two or more sets of husking rolls, of a hinged ear covering plate, arranged as described, so as to retain the ears in proper contact with the rolls, and provided with one or more dividing pieces or partitions, extending between each two contiguous or adjoining sets of rolls, in the manner and for the purposes shown and set forth.

5th, The combination with each set of husking rolls, E F, of an auxiliary adjustable roll, H, arranged, with relation to the exterior or lower roll, E, of each set, in the manner and for the purposes shown and specified.

6th, The combination, with each set of husking rolls, of an adjustable auxiliary roll, H, made tapering at its upper end, substantially as and for the purposes set forth.

7th, The combination, with two or more sets of husking rolls and adjustable auxiliary rolls, of the removable ear covering plate and guide, I M, the ear guide, K, and chutes or ways, L, for delivering the ears to the auxiliary rolls, the whole being arranged to operate substantially in the manner and for the purposes shown and set forth.

8th, The combination, with two or more sets of husking rolls, of a continuous ear cover or shield, I, with its division piece or pieces, M, substantially as and for the purposes set forth.

82,370.—GAME.—William H. Wilsen, Providence, R. I.

I claim a game, consisting of a combination of the pointer, D, and plate or disk, C, of which one is movable and the other stationary, the movable part being set by means of a ball propelled by the player, as set forth.

82,371.—PUMP.—Samuel Woodruff and H. B. Beach, Hartford, Conn.

We claim the arrangement of the series of valves, D and E, in relation to cylinder, B, annular chamber, a, and chamber, F, substantially as described for the purpose specified.

82,372.—BEE HIVE.—Valentine Zimmerman, Morris, Ill.

I claim, 1st, The slatted partition, E, arranged to support the frames, F, and the front ends of the lower frames, G, as herein shown and described.

2d, The securing of the lower comb frames, G, in position by means of the pins, I, and hooks, K, substantially as shown and described.

3d, The slides, C C, applied to the box or case, in connection with the springs, D, in the manner substantially as and for the purpose set forth.

82,373.—CAR STOVE.—William A. Allen, Medina, N. Y.

I claim the combination of the above described double door, having plates H and B, and screen, E, and provided with a lock, D, with the body of the stove and the flue, with the screen, F, therein, all being constructed and arranged substantially in the manner set forth.

82,374.—BUNG BORER.—John G. Baker and Henry Asbury, Philadelphia, Pa.

We claim the combination of the tapering tubular stock, A, its boring edge, x, reaming edge, x', and tapering screw, b, the whole being constructed and arranged substantially as and for the purpose herein set forth.

82,375.—DINING TABLE.—E. H. Bloebaum, and C. H. Nagel, St. Charles, Mo.

We claim, 1st, The central board, A, when composed of the pieces, a a1 a2 a3, and the annular rim, B, when composed of the pieces, b b1 d2 b3, when the said parts are united and arranged, substantially as herein shown and described, and for the purpose set forth.

2d, The arrangement of the frame, D, and legs, d d1 d2 d3 d4 d5 d6, herein shown and described.

82,376.—DREDGING MACHINE.—Albert Boschke, Boston, Mass.

I claim a dredging or excavating machine, in which are combined a floating hull, a, plow or scoop, s, and elevating buckets, all constructed and arranged to operate substantially as set forth.

82,377.—ANGLER'S REEL.—Willard H. Bradley, New York city.

I claim a fish line reel, composed of the two annular concaved disks, A A, as arranged on the shaft, f, with the space, g, at their peripheries, in combination with the frame, C C, constructed and operating substantially as and for the purposes set forth.

Also, in combination with the disks, A A, and conical journals of the shaft, f, the frame, C C, fixed to the foot plate, B, and provided with the variable connecting piece, d, for adjusting the bearings to the shaft, substantially as set forth.

82,378.—CLOTHES RACK.—B. K. Breneman, Newport, Pa.

I claim the arms, C C, grooved on their lower side, and provided with braces, E E, pivoted thereto, so that they may lie in the same, and connected to the upright, A, substantially as and for the purposes herein set forth.

82,379.—CONNECTING ROD.—Edward Brown, New York city.

Antedated September 16, 1868.

I claim the combination, with the double screw rod, C, of the two inclines, b and c, whether the said inclines be placed on the washer, E, and the end of the connecting rod, A, or on the two washers, D and E, substantially as herein described.

82,380.—SLED KNEE.—Benjamin F. Cady, Chittenango, N. Y.

I claim a sleigh knee having rod, A, and shield, B, constructed, combined and arranged, substantially as described, as a new article of manufacture.

82,381.—LIFTING JACK.—John Camp (assignor to himself and Henry Marshall), Olney, Ill.

I claim the combination of the reversible lever, B b b', the stand, A, and fulcrum pin, C, relatively arranged to operate in the manner described for the purpose specified.

82,382.—HAY SPREADER.—Nathan Chapman, Milford, Mass.

I claim, 1st, Giving the rake teeth, when raking, a forward and an upward movement, and a backward and downward movement, in regular succession by means of the toothed wiper wheel, G, traversing bar, N, wiper seat, S, and springs, L L, constructed and arranged to operate substantially as described.

2d, Giving the teeth, when tedding, a forward and upward movement, and a downward and a backward movement in succession, by means of the toothed wiper wheel, G, traversing bar, N, and inclined plane and groove on the block, X, substantially as described.

3d, Hinging the inclined block, X, so that the rear end will rise and let the pin or roller pass under it as it moves backward, and catch on the top as it moves forward, suostantially as described.

82,383.—MOP HEAD.—C. B. Clark, and E. L. Ferguson, Buffalo, N. Y.

We claim the nut, C, provided with flanges, c c', or equivalent, in combination with the collar portions, D D, formed with elongated openings, b, and ledges, l, substantially in the manner and for the purpose set forth.

82,384.—WAGON JACK.—W. Clifford, Mina, assignor to A. F. Jennings & Co., Dunkirk, and T. R. Coveney, Mina, N. Y.

I claim the swinging bar, D, pivoted to standard, B, with its free end resting on the disconnected lever, E, and guided by the straps, d, rigidly secured to the lever, so as to operate in the manner and for the purpose as described.

82,385.—EQUALIZER FOR VEHICLES.—J. J. Connelly, Chicago, Ill.

I claim a draft equalizer consisting of an evener or draft bar, A A, pulley, H I G J, and chains, O O, the chain, O, passing over the pulleys, H G, and providing a draft attachment for the outside trace of the nigh horse, and the inside trace of the off horse, and the chain, N, passing over the pulleys, J I, and providing a draft attachment for the outside trace of the off horse and the inside trace of the nigh horse, substantially as and for the purpose specified and shown.

82,386.—WASHING MACHINE.—Michael Culler, Fredericksburg, Ohio.

I claim, in a washing machine, suspended between the oblique standards, A A, and upon the rods, a a, the adjustable corrugated cylinder, G, hung upon the frame, D, and secured to operate in the tub, or inserted above it, by the clamps 1 1, all as herein shown and described.

82,387.—SEED SOWER AND HARROW COMBINED.—C. Curtis, Galesburg, Ill

I claim the hopper, B, drum, E, box, F, and bar, H, constructed and arranged as described, and combined with the adjustable frame, L, and revolving harrows, Z, substantially as set forth and for the purpose described.

82,388.—ARCHED BRIDGE.—Joseph Davenport, Massillon, Ohio.

I claim, 1st, The rods, N N, when used in combination with the arch, B, and posts, K K, substantially as and for the purpose specified.

2d, Supports, O, when used in combination with the arch, B, and rods, N N, substantially as and for the purpose specified.

3d, The lever posts, K, when constructed of the side plates, K K, bolts or rivets, k k, blocks, M M, and cross piece, L, and used in combination with the chord bolt washer iron, F, the shoe, G, the tension bolt, J, with straps, I I, attached thereto, and to the chords, A, the rods, N N, and the arch, B, substantially as and for the purpose herein specified.

82,389.—GLASS LIGHT.—W. A. Demuth, New York city.

I claim a glass light, constructed of solid glass rods, arranged in the manner described.

82,390.—COAL-MINING MACHINE.—G. E. Donisthorpe, Leeds, Eng. Patented in England Dec. 5, 1865.

I claim, 1st, The combination of the mining machine with a screw and nut to move it forward, and with a removable pillar to sustain the thrust of the screw, substantially as before set forth.

2d, The combination of the mining machine with a steadying bar, sustained by removable pillars, connected and supported as described, to steady the machine when at work, and prevent it from getting off the rails, substantially as before set forth.

82,391.—COAL-CUTTING MACHINE.—G. E. Donisthorpe, Leeds, Eng. Patented in England April 21, 1866.

I claim, 1st, The combination, substantially as set forth, of the rack on the rail, the geared pinion, the worm, and the hand wheel, with the lifting screw, I, whereby the feeding devices on the carriage may be released from the rail.

2d, The combination, substantially as set forth, of the carriage, the feeding mechanism, the guiding mechanism, and the cutting mechanism, for the purpose set forth.

3d, The combination, substantially as set forth, of the carriage, the cylinder, the cutter connected directly with the cylinder, and the mechanism for controling the induction valve of the cylinder, whereby the valve is not wholly opened unless the cutter makes a full stroke, and, consequently, the depth of one cut regulates the force applied on the next stroke of the cutters.

4th, The combined arrangement of apparatus herein described, for cutting grooves or holes into the floor or roof of a mine.

82,392.—SASH FASTENER.—J. E. Downs, Lowell, Mass.

I claim the combination and arrangement of the hinge, e f, and fastener, k, when arranged for the purposes as described and fully set forth.

82,393.—COFFEE ROASTER.—J. E. Edmundson, Bartlett, Ohio.

I claim the arrangement of the plate, A, walls, B B, fixed cylindrical case, C, having the door, B', rotating interior cylinder, D, having the opening, d, in its side, and crank shaft, E, substantially as described and shown and for the purpose specified.

82,394.—APPARATUS FOR PRESERVING BEER, ALE, ETC.—R. Eickemeyer, N. Y.

I claim, 1st, The process, substantially as herein described, of preserving beer or other perishable liquids or substances, by the connection or combination of the vessel containing the same with a carbonic acid gas generating apparatus or reservoir, in such a manner as that the contents of said vessel, or vacant space of the latter, is or are kept constantly charged with said gas, in a regular and automatic manner, as rapidly as said contents absorb the gas or contents of the vessel are drawn off, substantially as specified.

2d The arrangement, in connection with the vessel containing the liquid or article requiring to be preserved, of an upper acid reservoir, B, and lower gas generator, C, for supply, in a regular and automatic manner, of the gas to said vessel, and whereby the gas is forcibly expelled into the latter by the superincumbent weight or pressure of the column of liquid acid, essentially as herein set forth.

3d, The arrangement of the said reservoir, B, gas generator, C, and washer, D, in an apparatus for supplying, in an automatic manner, carbonic acid gas to the vessel, or its contents requiring to be preserved, substantially as shown and described.

82,395.—PADDLE WHEEL.—P. Emerson, Carondelet, Mo.

I claim the paddles, E, when hinged to the outer rim of the wheel by means of journals, c, placed at their bottom edges, substantially as described and set forth.

82,396.—BRICK MACHINE.—J. A. Falconer and R. Graham, Jersey City, N. J., assignors to E. C. Bradford, J. H. Renick, and O. A. Clough, New York city, assignors to J. H. Renick.

I claim, 1st, The hinged hook, L, in combination with the spring, s, connecting rod, M, and crank pin, k, of the crank, K, connected with the driving power of the machine, substantially as and for the purpose described.

2d, In combination with the hinged hook, L, spring, s, connecting rod, M, and crank pin, k, of the crank, K, the adjustable clamp, m, all constructed and arranged substantially as and for the purpose set forth.

82,397.—TAKE-UP FOR THREAD IN SEWING MACHINES.—J. Fanning, Brooklyn, N. Y., assignor to J. S. Andrews, New York city.

I claim the eye, h, upon the arm, b, in combination with the eye, i, near the end of the lever, e, that moves the needle-bar, so arranged as to draw upon and tighten the thread between the eye, h, and the guide, k, on the needle bar, as the needle descends, for the purposes set forth.

82,398.—FARM GATE.—Gilbert Gibbs, Fairview, Ind.

I claim, 1st, The oblique link, a, in connection with the central lever, E, when so arranged as to draw the bolt, n, from the catch or socket, c, before opening the gate, substantially as shown and specified.

2d, In combination with bolt, n, lever, B, link, a, and central lever, E, the bars, S S, and hand levers, D D, all arranged to operate substantially in the manner and for the purposes as set forth.

3d, Attaching a panel composed of the post, G, diagonal, J, and bars, m m m, and sill, O, with a gate, when the panel is so arranged, that, by means of the notches in the post, G, the forward part of the gate may be raised, as described and shown.

82,399.—ROSSING MACHINE.—Charles Gilpin and Laurence T. Dickinson, Cumberland, Md.

We claim, 1st, The combination and arrangement, with a cutting device, of the rollers, B B1 B2 B3, provided with the teeth, c c c, and operated by belting and gearing in such a manner that they all have an equal and uniform motion, the two upper ones rotating in one and the same direction, and the two lower ones in the opposite direction, substantially in the manner and for the purpose specified.

2d, The arrangement of the knife, K, with reference to the rollers, B1 B3, substantially as and for the purpose set forth.

3d, The arrangement of the idle roller, s, in combination with the rollers, substantially as described.

82,400.—ROSSING MACHINE.—Charles Gilpin and Laurence T. Dickinson, Cumberland, Md.

We claim, 1st, The arrangement of the reciprocating saw, M, with relation to the rollers, substantially as described.

2d, The combination of the saw, M, pitman, H, spring, P, lever, R, and cam u, on shaft, W, substantially as described, and for the purpose specified.

82,401.—MANUFACTURE OF SMALL BEER.—O. F. Green and James E. Clark, St. Louis, Mo.

We claim, 1st, The ingredients hereinbefore mentioned, or their substantial equivalents, when subjected to the processes substantially as described.

2d, The beverage formed from such ingredients, as a new article of manufacture, substantially as set forth.

82,402.—GEAR CUTTING TOOL.—Jackson Harrington (assignor to himself and A. C. Lippitt), New London, Conn.

I claim the series of cutters, A A, in combination with the circular socket plate or holder, E, and confining plates, G G, arranged substantially as and for the purposes described and set forth.

Also, the circular cog, I, circular recesses, J, and brace nut, M, when used in combination with the cutters, A A, and holder, E substantially as and for the purpose set forth.

82,403.—KNIFE FOR CUTTING GREEN CORN FROM THE COB.—Jackson Harrington (assignor to himself and A. C. Lippett), New London, Conn.

I claim the concave plate, C, with V-shaped cutters, D D, and guide rib, E, in combination with the rectangular shaped shank, B, arranged substantially as and for the purposes described and set forth.

82,404.—MACHINE FOR SHEARING SHEEP.—Geo. Harsin and C. T. Sanders, Kirkville, Iowa.

We claim, 1st, In combination with the cutter, C, the belt, B, and cord, B', running over pulleys, and kept taught by weights, arranged to operate substantially as and for the purpose set forth.

2d, The combination, in a sheep shearing machine, of a stationary blade, k, and oscillating blade, l, constructed and arranged, in relation to one another, substantially as set forth.

3d, The arrangement of the pulley, G, having a wrist pin, G1, slotted arm, H, oscillating cutter, I, and stationary knife, K, within the hollow case, C1, substantially as and for the purpose set forth.

82,405.—THILL COUPLING.—Jas. Haverly and Chas. A. Tibitts, La Porte, Ind.

We claim, 1st, The construction of the clasp, A, with its box, B, attached thereto, substantially as shown and described.

2d, The construction of the arm, E, and the arrangement therefor with reference to the box, B, substantially as set forth.

82,406.—CULTIVATOR.—Archibald T. Heflin, Monmouth, Ill.

I claim, 1st, A two wheeled elevated draft frame, with a draft pole, C, secured upon the cross beam, B', of said frame, A, swiveling double tree, C', applied to the draft pole, and connected to links, b b, in combination with levers, c, and scraper carrying beams, D D, all combined, arranged, and operating substantially as described.

2d, The attaching hooks, J J, applied to links, b, which are connected to the double trees, C', and to levers, c c, said parts being employed in a machine constructed and operating substantially as described.

82,407.—STOVE PIPE ELBOW.—C. Hoeller, Cincinnati, Ohio.

I claim the elbow for stove pipes, constructed as herein shown an described.

82,408.—CLOTHES DRYER.—A. S. Hopson, Plainview, Minn.

I claim the flanged plate, C, and slotted sliding plate, D, in combination with the rod, a, nut, e, arms, B B, and plate, A, all constructed as described, and operating substantially as and for the purposes herein set forth.

82,409.—MACHINE FOR MAKING HORSE SHOES.—Ozial A. Howe, Jersey City, N. J.

I claim, 1st, The combination of the rotating pressure disk, G, the rotating die, F, and the oscillating frame, B, substantially as and for the purpose specified.

2d, The cutting lip or corner, l, so arranged upon the pressure disk, G, and in relation with the shoulder, m, of the die, F, as to sever the shoe from the bar, substantially as and for the purpose specified.

3d, The arrangement of the rotating presser cone, F*, upon the oblique shaft, I, when combined with the presser disk, G, and the rotating die, F, carried upon the oscillating frame, B, substantially as and for the purpose specified.

4th, The arrangement of the guide notch, b1, and wheel, c, upon the frame, B, and in relation with the rotating die, F, carried thereby, and the presser disk, G, substantially as and for the purpose specified.

5th, The arrangement of the spring, J, with reference to the rotating die, F, presser disk, G, and presser cone, F*, substantially as and for the purpose specified.

6th, The combination of the pusher rod, n, spring, v, and inclined plane, u*, with the shaft, C, and die, F, substantially as and for the purpose specified.

82,410.—GEARING FOR HARVESTERS.—Moses G. Hubbard, Syracuse, N. Y.

I claim, 1st, The combination of the two gear wheels, C and E, of unequal size, with the spur pinion, F, and main gear wheel, G, substantially as described.

2d, The employment of two or more concentric gear wheels, all of which may be made to revolve in driving the cutters, or one or more of which may be held stationary, for varying the speed of the cutters, as described.

3d, Two or more gear wheels, of unequal size, arranged upon line shafts, or upon a divided axle, in combination with a shifting clutch, whereby the speed of the cutters may be varied, as described.

82,411.—GEARING FOR HARVESTER.—Moses G. Hubbard, Syracuse, N. Y.

I claim, 1st, The combination of the driving gear wheels, E and F, of unequal size, attached permanently to the main cross shaft, and gearing into the two corresponding loose gear wheels, A and B, with sliding clutch, d, and the firmly attached gear wheel, H, on the cross auxiliary shaft, C, and the straight pinion and bevel wheel, I, revolving loosely on shaft, G, arranged and operating specifically as described.

2d, The triple gear as described, in combination with the means for changing the speed of the cutters, arranged and located relative to the main and counter shafts, substantially as and for the purpose specified.

82,412.—HARVESTER.—Moses G. Hubbard, Syracuse, N. Y., assignor to Hubbard Mower Company.

I claim, 1st, Attaching the seat by the two pivoted springs arranged one in advance of the other, and in the same plane, for the purpose and substantially as described.

2d, The seat plate, D, provided with the two sockets or recesses, arranged in line, as described, and adapted to receive and permit the adjustment of the seat springs, substantially as and for the purpose described.

3d, Mounting the driver's seat for a reaping machine upon springs so arranged as to preserve the horizontality of the seat, and at the same time to give it both a forward and downward motion, for the purpose and substantially as set forth.

82,413.—HARVESTER.—Moses G. Hubbard, Syracuse, N. Y., assignor to Hubbard Mower Company.

I claim, 1st, Connecting the cutting apparatus to the main frame, by the yielding elastic corner and the vertically sliding adjusting rod, arranged and operating as and for the purpose described.

2d, The set screw, V, in combination with the wear plate and hinged shoe, arranged substantially as and for the purpose described.

3d, The lifting arrangement, consisting of the raising handle, U, cam, B, and chain, C, combined and operating as described, whereby, when the cutting apparatus is raised, said lifting apparatus is automatically locked for holding the cutting apparatus in its elevated position, as set forth.

82,414.—HARVESTER.—Moses G. Hubbard, Syracuse, N. Y., assignor to Hubbard Mower Company.

I claim, 1st, Attaching the pole to the main frame specifically in the manner and for the purpose set forth.

2d, The combination of the main frame with the pole extension piece attached and arranged as shown for the purpose described.

82,415.—HARVESTER.—Moses G. Hubbard, Syracuse, N. Y., assignor to Hubbard Mower Company.

I claim, 1st, The curved wear plate, H, provided with the expanded perforated ears, whereby the hight of the cutting apparatus can be adjusted without interfering with the action of the straight pitman, substantially as set forth.

2d, The independent or detachable sustaining rod, by means of which the driver in his seat on the machine is enabled to raise and sustain the cutting apparatus, substantially as described.

82,416.—MANUFACTURE OF PAINT.—Wm. C. Hurd, New York city.

I claim, 1st, The combination of feldspar with oil and lead, zinc, or any other suitable material for paints and colors, substantially as set forth.

2d, In addition of dissolved linseed gum or saponaceous oil, mixed with linseed oil in the grinding, or mixing feldspar with any other suitable materials for paints or colors, substantially as set forth.

82,417.—BOOTS.—John P. Jamison, New York city.

I claim the arrangement of the longitudinal seam or seams, a, in the boot leg, so as to rise from the hollow of the shank, or thereabouts, or (when the latter is applied to the foot) in front of the ankle bone, the same also being curved, as at b, to admit of a forward extension of the counter, substantially as and for the purpose or purposes herein set forth.

82,418.—COMBINED LATCH AND LOCK.—Frederick L. Johnson, Wallingford, Conn.

I claim, 1st, The tumbler, D, held by spring, E, having a lateral motion to enable one bolt to act upon both as a lock and latch, constructed substantially in the manner herein set forth.

2d, The bolt, B, provided with projections, a a and b b, in combination with the tumbler, D, provided with arms, C C, and acted on by the said tumbler, substantially as herein set forth.

3d, The catch, F, held by the escutcheon, and arranged to act upon and keep the tumbler from sliding laterally, constructed in the manner substantially as herein set forth.

82,419.—ROOFING CEMENT.—John L. Kidwell, Washington, D. C.

I claim, 1st, A water and fire-proof composition, for roofing, flooring, etc., prepared of hydraulic cement, tar, sulphur, and naphthaline, or its equivalents, substantially as described and set forth.

2d, The above cement composition, incorporated with powdered minerals or metallic ingredients, substantially as described and set forth.

82,420.—CARRIAGE SHACKLE.—George G. Larkin, West Amesbury, Mass.

I claim the disk, a, provided with radial sockets, and carrying the pad, C, when formed with a screw threaded shank, e, adjustable in the front side of the clip, A, as herein described for the purpose specified.

82,421.—FIRE EXTINGUISHER.—W. H. Laubach, Philadelphia, Pa.

I claim, 1st, The tube, C, in combination with the diaphragm, E, and valve, D, and vent tube, a, operated and constructed substantially in described.

2d, The diaphragm, E, and spiral spring, f, constructed and operated as described.

3d, The cap, g, operating on the diaphragm, E, constructed and operated as described.

82,422.—CORN PLANTER.—John L. Leas (assignor to himself and Andrew B. Lerew), York Sulphur Springs, Pa.

I claim, 1st, The slide, C, in combination with the sheaves, E F, and straps, H, J, and K, as and for the purpose described.

2d, The pivoted levers, M and L, in combination with the elastic connections, I, as and for the purpose described.

82,423.—CULTIVATOR.—M. F. Lowth and T. J. Howe, Owatonna, Minn.

We claim in combination with the mortised beam, A, and the tooth, B, having the shanks, b b', and pivoted on the bolt, c, a stirrup-shaped clamp, E, having an oblong or semi-circular opening, O, the side, o, of which, that bears against the shank, b', being straight, and said clamp being confined to the beam, A, and tightened or loosened by means of a screw shank, r, passing through a slot in the side of the beam, and a screw nut, a, fitting upon it outside of the beam, and screwing against the side of the beam, or against a washer, substantially as described.

82,424.—PLANE FOR CUTTING BLIND SLATS.—R. E. Lowe, Upper Alton, Ill.

I claim, 1st, The arrangement of the shoe, C, stock, A A', screws, c c', cutter iron, D, and clamping hooks and nuts, F G, substantially as described, when the parts are constructed to operate in the manner set forth.

2d, The arrangement of the guards, I I, with the knife, D, the track, C, and the gage, H, constructed and operating substantially as described.

82,425.—DRIVING HOOP.—Timothy Lucey, Salem, Mass.

I claim a driving hoop, having a construction substantially as described.

82,426.—CUPBOARD AND TABLE.—J. C. Mack, Bristol, Conn.

I claim the combination of the cupboard, A, shelves, F, and doors, D, with table, B, and legs, C, arranged substantially as and for the purpose specified.

82,427.—HAY ELEVATOR.—Harvey McCown and Luther M. McCown, Enon Valley, Pa.

We claim the jaws, I I, in combination with the disk, K, and wedge, L, or its equivalent, when constructed and operated substantially as and for the purpose herein shown and described.

82,428.—PIANO.—Frazee B. McGregor (assignor to himself and George A. Hoyt), Pontiac, Mich. Antedated September 14, 1868.

I claim the arrangement of the couplers, D D, horizontal bars, C C, placed one above the other, with the elbows, e e, and levers, d d, so that when the pedal raises the levers, the upper bar is raised against the couplers, parallel, and raises the coupler against the keys, coupling them together the entire length of the key board, right or left, or both, as herein set forth.

82,429.—PRESERVING FRUIT.—David M. Mefford, Norwalk, Ohio, assignor to himself and Stephen Boalt.

I claim, 1st, Preserving fruit by treating or charging the same with sulphurous acid gas, and then subjecting it to heat, in the manner set forth.

2d, Charging raw fruit with sulphurous acid gas preparatory to its being heated, by means of air pumps or bellows, substantially as set forth.

82,430.—CARVING MACHINE.—George Merrill, Newburyport, Mass., assignor to Samuel Bilsh, Piscataway, N. J.

I claim, 1st, The combination of the tables, D and P, connected by links or rods, n m, to the lever, h, substantially as described.

2d, The shaft, I, mounted in the main frame, and provided with the rigid arms, a and b, carrying the adjustable guide, c, and the cutter, d, and arranged in relation to the tables, D and P, substantially as described.

3d, The table, D, provided with the side pieces or frame, H I, for supporting the upper table, P, and permitting the latter to be moved thereon, as herein described.

82,431.—GRAIN SEPARATOR.—Clark W. Mills and Lewis S. Chichester (assignors to themselves and George H. Nichols), Brooklyn, N. Y. Antedated Sept. 14, 1868.

We claim the adjustable curb, l, that can be moved towards or away from the point of delivery of the grain, in combination with the adjustable blast regulator, k, applied substantially as and for the purposes set forth.

82,432.—GRAIN DRYER.—Clark W. Mills and Lewis S. Chichester (assignors to themselves and George H. Nichols), Brooklyn, N. Y. Antedated Sept. 10, 1868.

We claim the series of air tubes, b b, open at their under side, in combination with a hopper delivering the grain upon such series of tubes, in the manner set forth, so that a current of air shall pass through the grain as it falls from said hopper, and through the series of air tubes, and in contact with such grain, substantially as and for the purposes set forth.

82,433.—ROLLING MILL.—Foster Nevergold and David Brose, Pittsburg, Pa.

We claim, 1st, The shaft, J, crank, L, and pitman, M, in combination with the crank, N, movable collar, P, and shaft, O, all constructed and arranged as described, substantially as and for the purpose herein set forth.

2d, The combination of the table, V, arm, b, side pieces, X X, arms, T T, shaft, O, legs, U U, hinged leaf, Y, slotted arm, Z and the lever, d, all constructed and arranged as described, and operating substantially as herein set forth.

3d, The stay lever, r, swiveled pin, s s, and perforated lever rest, in combination with crab lever, p, all constructed and arranged in the manner and for the purpose substantially as herein set forth.

4th, The upright shaft, m, and pinion, B', in combination with pinion, C', shaft, A', pinions, F' F', cog wheels, E' E', and regulator, G', all constructed, arranged, and operating substantially as herein set forth.

82,434.—DOOR BELL.—W. H. Nichols, East Hampton, Conn.

I claim the lever, H, pivoted to the plate, A, at one end, and provided with a slot at its other, through which one end of the hammer wire passes, said lever being provided with lugs, d and e, by means of which it is connected to the spring, E, and to the bell rod, N; the lug, d, to which the rod, N, is attached, being centrally located upon the lever, to facilitate its operation, as and for the purpose specified.

82,435.—REFINING CAST IRON.—H. S. Osborn, Easton, Pa.

I claim the self-generating steam rabble, or the rabble in which the steam is generated by the heat surrounding the raoble, in the manner and for the purposes substantially as above described.

82,436.—MECHANICAL MOVEMENT.—Isaac E. Palmer, Hackensack, N. J. Antedated Sept. 14, 1868.

I claim the combination of the toothed wheel, A, with the ring, C, having a female thread, a, in or around it, arranged relatively to each other for operation together substantially as shown and described.

82,437.—RECIPROCATING STEAM ENGINE.—Francis S. Pease, Buffalo, N. Y.

I claim, 1st, The construction and arrangement of the frame, or covers, or cylinder heads of the two cylinders, the lowest section or surface forming a cover to the cylinder, B, and the upper surface the cover of the cylinder, A.

2d, The combination of the lower cylinder head, H', with the section, h, whereby to gain access to the cylinder, B, as herein set forth.

3d, The arrangement of the stuffing box inside the cylinder and with the cylinder head, so that the bolts passing through the cylinder head can be reached from the outside between the two heads.

4th, The combination of the two cylinder heads, H H', formed or connected together in the manner herein described, with sufficient space between them to give access to the bolts of the stuffing box, S.

82,438.—FRUIT BOX.—John M. Perkins (assignor to R. R. Perkins), Plainfield, N. J.

I claim a box constructed of two strips, of veneer, in which the top or bottom may be used as bottom or top indiscriminately, and constructed of two pieces of veneer, in the manner and for the purposes set forth.

82,439.—WAGON BRAKE.—J. S. Pfrimmer, Lanesville, Ind.

I claim the arrangement upon the front section of a vehicle of the forked rod, a, oblique rods, c c, levers, D D, keepers, d d, and spring, e, all constructed and operating as set forth.

82,440.—FASTENING FOR BUTTONS.—Alfred Rix, San Francisco, Cal.

I claim the headed shank and open washer for securing the button to the cloth or garment, constructed substantially in the manner and for the purpose set forth.

82,441.—WASHSTAND AND SICK CHAIR.—Valentin Schreck, Philadelphia, Pa.

I claim the described combination of a sick chair and portable washstand when the parts composing the former are permanently or otherwise attached to a swinging door, C, and otherwise arranged as and for the purpose specified.

82,442.—WINDOW SHADE FIXTURE.—Frederick A. Seborn, David R. Dunlap, and Joachim F. C. Geist, Zanesville, Ohio.

We claim the arrangement of the cord, C, pulleys, B B, roll, A, fixed cord, E, and cord, F, substantially as shown and described.

82,443.—DRAFT EQUALIZER.—Seth Shadduck, Elk River township, Iowa.

I claim the draft bar, F, provided with adjusting holes, c c c, etc., ring, K, substantially for the purpose described.

82,444.—SAFETY GUARD FOR LOCKS.—W. C. Sinclair, New York city. Antedated Sept. 18, 1868.

I claim the oscillating plate, g, having a projecting pin, i, in combination with the cam slot, j, on the latch, k, substantially as and for the purpose described.

82,445.—MODE OF HARDENING GAS-BURNER TIPS MADE FROM SOAPSTONE, ETC.—Henry J. Smith, Boston, assignor to Joseph C. Wightman, Newton, Mass.

I claim the hardening and rendering impervious to the action of acids and heat, of gas burners and gas-burner tips, or any part thereof, made from soapstone, talc, talcose rocks, or minerals, by heating them in a vessel containing carbon, substantially as above described.

82,446.—CHURN.—W. C. Smith, Yantic, Conn.

I claim the groove, c, and recess, m, on the gear shaft, C, and the lip, E3, and arm, E2, on the locking pin, E, constructed and adapted for joint operation relatively to each other and to the beater shaft, A, and to the gear wheel, D, as and for the purposes herein set forth.

82,447.—TUMBLING SHAFT FOR CONNECTING POWER WITH MACHINERY.—Daniel Snell (assignor to himself and J. H. Gano), Springfield, Ohio.

I claim the combination of the collar, C, with its interior bearing, c, and the block end, b, of the rod shaft, B, sliding in the groove, D, of the part, A, for retaining the shaft in position at any point in the line of its extension or contraction, as applied in a tumbling shaft, for transmission of power by a rotary or revolving motion, the whole constructed substantially as described, as and for the purpose specified.

82,448.—PEGGING MACHINE.—J. W. Soule, Boston, Mass.

I claim the arrangement of the peg cutting mechanism, so that but one peg is cut at the end of the peg wood, which peg, after being cut, is fed forward under the driver, substantially as described.

Also, the combination of the ratchet driving-pawl, m, with a reciprocating slide, n, to which the pawl is jointed, and by means of which it is actuated, substantially as described.

Also, in combination with the peg feed wheel, d, feed ratchet, l, and ratchet driving pawl, m, the ratchet-detaining pawl, s', substantially as shown and described.

Also, in combination with the peg-wood feed wheel, d, the spring, h, pressure of which is adjusted by the screw, k, substantially as set forth.

Also, in combination with the slide, h2, spring, d2, and lever, e2, the adjusting plate, h2, substantially as and for the purpose set forth.

Also, in combination with the ratchet driving pawl, m, and the reciprocating slide, n, to which the pawl is jointed, the cam, p, for driving the slide, n, through the lever, r, and connecting rod, s, substantially as shown and described.

82,449.—COAL STOVE.—S. B. Stewart, Brush Valley, Pa.

I claim the lower section, A, constructed as described, in combination with the metal plates or strips, d d, and upper section, C, all arranged substantially as and for the purpose set forth.

82,450.—CARPENTERS' PLANE.—J. B. Tarr, Chicago, Ill. Antedated Sept. 16, 1868.

I claim, 1st, The combination of the central clamping and tightening device with the adjustable supports, C D, the said device and the supports being applied to a plane stock, and in the relation to the plane iron thereof, substantially as and for the purpose herein described.

2d, Making the two supports or abutments, C D, adjustable, substantially as and for the purpose herein described.

3d, Applying pressure to a plane iron between two supports, C D, through a device, E F, substantially in the manner and for the purpose herein described.

4th, Changing the pitch and tightening the plane iron by the same means and at the same time, the means employed being constructed and operated substantially as herein described.

5th, The adjusting of the plane iron by means of the clamping device, composed of the screws, C D and E, nut, F, and plate, b, and applied in such manner that the bit is tightened, and the pitch changed at the same time and by the same means, when constructed to operate substantially in the manner described.

6th, Arranging the plane iron beneath the heads or shoulders of two adjustable bearings, C D, and under a shoulder of a nut, F, so that it may be adjusted by means of either or both of the bearings, C D, and may be tightened and have its pitch changed by the screw, E, all substantially in the manner and for the purpose described.

82,451.—HARROW.—J. J. Thomas, Union Springs, N. Y.

I claim a land brush or spiked harrow, constructed of pieces of plank, hinged together as described, and provided with transverse inclined teeth projecting backward at such an inclination as to cast off or sup over any stalks of weeds, straw, or other refuse matter, substantially as described.

82,452.—SPIKE MACHINE.—L. Thomas, Allegheny City, assignor to A. Kloman, Lawrenceville, Pa.

I claim, 1st, In a machine for making spikes and bolts, a sliding carriage, B, which carries the spike or bolt blank after being severed from the parent bar, and while finally gripped to pressing dies, in combination with a header, G, constructed and operating substantially as and for the purpose hereinbefore set forth.

2d, The pair of swinging and pointing tools, a', in combination with a pair of guiding and pressing fingers, H, arranged and operated substantially in the manner and for the purposes hereinbefore described.

3d, The cam, F, cam lever, e, and double parallel bars, H, or their mechanical equivalents, all arranged with reference to one of a pair of pressing dies in a spike machine, to secure first a partial and then a complete closing of the dies on the spike blank, substantially in the manner and for the purposes above set forth.

4th, In the manufacture of railroad spikes, the header, G, with a slotted shank, hung and operated, substantially as above described, so that it shall except at the completion of the stroke of the machine, have its face inclined to the direction of the faces of the pressing dies, for the purposes hereinbefore specified.

5th, In a machine for making spikes, the arrangement of the cams, d and e, operating in cam yokes, substantially as described, so that one cam, d, which actuates the cutting and pointing tools, a', shall act a little in advance of the other cam, e, which operates the sliding carriage, b, in order that such tools, a', may be partially opened and closed in advance of the beginning of the motion of the carriage, substantially as above described.

6th, The combination, in a spike machine, of swinging pointing tools, a', pointing rolls H, pressing dies, a a', and header, G, substantially as and for the purposes above set forth.

82,453.—SAUSAGE STUFFER AND LARD PRESS.—Nathaniel S. Undenkuffler, Norristown, Pa.

I claim the combination of the vessels, H and J, constructed as specified, and connected, within the dovetailed recess in the table, with the standard I, lever, E, and follower, F, all as herein shown and specified.

82,454.—CEMENT.—George William Upham, Amherst, N. H.

I claim the within described cement, composed of the ingredients herein named, and compounded in or about the proportions set forth.

82,455.—SHAFT COUPLING.—James S. Upton, Battle Creek, Mich.

I claim the sockets, B B, provided with gudgeons, C C, and connected to the slotted ring, A, by means of the pins, a a, secured in the slots, x x, by the leather keys, all as herein shown and described.

82,456.—JOINT FOR CARRIAGE TOP PROP.—Elbertson W. Waite, New Haven, Conn.

I claim, 1st, A joint, formed by combining segmental grooves, near the ends of the parts to be united, with a circular rib upon the joint piece, substantially as specified.

2d, The joint pieces, e, with circular ribs, d, entering segmental grooves, c, in the bars, a b, in combination with the cylinder, i, and bolt or rivet, f, substantially as specified.

82,457.—BEDSTEAD.—William M. Ward, and Peter Bennage, Eureka, Ill.

We claim a bedstead, having rods, C, hooks, D, swivels, E, screws, G, pin-holes, a, slats, d, strips, e, and blocks, b, all arranged and operating substantially as described.

82,458.—LAMP.—Charles Webber, and Henry Reimann, West Meriden, Conn.

We claim the construction and arrangement of the cup, B, recessed thimble, D, supporting sleeve, c, open platform, E, air sleeve, F, and cone, G, as and for the purpose described.

82,459.—SOAP AND DETERGENT COMPOUND.—Henry W. Weedon, High Point, N. C.

I claim the particularly specified combination of ingredients, and the definite quantities of the same, as set forth.

82,460.—STEAM GENERATOR.—S. Lloyd Wiegand (assignor to Walter J. Budd), Philadelphia, Pa. Antedated September 4, 1868.

I claim, 1st, The oblique or spiral deflectors or guides in double boiler tubes, substantially as shown and described.

2d, The tangential or spiral mouths, as shown, for conducting a supply of fluid to the descending columns in double tube boilers, as shown and described.

3d, The deflecting caps or domes, or the equivalents thereof, substantially as shown and described.

4th, The conical adjutages, C C, substantially as shown and described.

82,461.—ROTARY EMBOSSING PRESS.—I. M. Wilbur, Cleveland, Ohio.

I claim, 1st, The combination of the rollers, B C, impression plates, D, and counter plates, D', operated by means of the lever, E, through the medium of the cog wheels, A and C', the whole being constructed and arranged in the manner shown and described, as and for the purpose set forth.

2d, The lever, E, with its adjustable pawl, F, in combination with the rollers, B C, arranged to operate as and for the purpose described.

82,462.—INK PAD FOR HAND STAMP.—I. M. Wilbur, Cleveland, Ohio.

I claim the improved ink pads herein described, consisting of the blocks, A A', provided with the composition inking surface, C, in combination with the ink reservoir, H, distributing rollers, G G, mounted on the carriages, D D, the guide rods, B B, and handles, K K, all constructed and arranged to operate substantially as and for the purpose set forth.

82,463.—MACHINE FOR FORMING STEREOTYPE PLATES.—I. M. Wilbur, Cleveland, Ohio. Antedated September, 16, 1868.

I claim, 1st, The roller, C, having a milled or file cut circumferential surface, for the purpose described, in combination with the apron, D, arranged and operating as and for the purpose set forth.

2d, The sliding bed, E, having a head or upright, g, with its curved surface, and the adjusting set screw, H, in combination with the roller, C, and apron D, all constructed and operating as described, and for the purpose set forth.

82,464.—STEREOTYPERS' PUTTY.—I. M. Willbur, Cleveland, Ohio. Antedated Sept. 17 1868.

I claim the composition hereinabove described, for the purposes specified.

82,465.—HAND BRUSHING AND POLISHING APPARATUS.—William H. Wilson, New York city.

I claim, 1st, So arranging the coiled spring and the system of gearing within the cylindrical body furnished with axial handles, as to secure the rotary movement of such body, substantially as herein set forth.

2d, The arrangement of the friction brake within the cylindrical body furnished with axial handles, whereby the rotary movement of the same may be stopped, substantially as herein set forth.

3d, The arrangement of the coiled spring, the system of gearing, the stem of the handle, A*, and the frame, A, with reference to each other and the friction pinion, m, dividing the cylindrical body, B, substantially as and for the purpose specified.

82,466.—CAR WHEEL.—William Wilmington, Toledo, Ohio.

I claim the within described method of casting car wheels of two qualities of iron, that is to say, one or said qualities of iron being poured into the portion of the mold designed to form the hub of the wheel, and the other being poured into that portion of the mold designed to form the rim of the wheel, the two currents of iron meeting within the mold, and there acting upon and mingling with each other, substantially as set forth.

Also, as an improved manufacture a car wheel produced of two qualities of molten iron, by the method herein set forth.

82,467.—OIL GLOBE FOR STEAM CHEST.—Charles A. Wilson, Cincinnati, Ohio.

I claim the arrangement, as described, of the globe, A, hub, C, cock, E, apertures, F G, recess, H, channel, I I, passages, J J K I, and channel, P, as herein described.

82,468.—COMPOSITION FOR DESTROYING INSECTS ON POTATO PLANTS.—James P. Wilson (assignor to himself and V. B. Dafoe), Elmwood, Ill.

I claim a powder, prepared of the materials and in the manner specified, to be used for the destruction of potato bugs.

82,469.—WHIFFLE TREE HOOK.—James Wood, Utica, N. Y.

I claim the cap, B, with the hook, B', cast or attached to it both shaped and constructed as herein shown, and secured to the whiffletree in the manner and for the purposes herein shown and described.

82,470.—MAKING NUTS.—Oliver W. Yale, Hartford, Conn.

I claim the arrangement of the cams, c c', cam grooves, F F, and crank shaft, C, with the cross head, D, levers, U P, and toggles, B B, in the manner described.

Also, the arrangement on the anvil, L, of the stationary die, K, slides, M O, edge swages, 2 2, and stripper, U, in the manner described and for the purpose set forth.

Also, the combination of the punches and face swages with the edge swages, the transferrer and the anvil block, all constructed, arranged and operated substantially as described.

82,471.—APPARATUS FOR EXTINGUISHING FIRE.—George Clark, Jr., Boston, Mass.

I claim the combination and arrangement of the water tank, C, the compartments, G and H, and the pumps, J and K, (the latter being disposed within the intermediate compartments, I, and both being connected with the air chamber), the pipes, a a and c d in addition to the ordinary feed and discharge pipes of the pump.

82,472.—ARMY WAGON.—Alfred Sully, United States Army.

I claim, 1st, The body, C, constructed as described, and provided with seats, F F F and E, receptacle, L, and railing, M, all substantially as and for the purposes herein set forth.

2d, In combination with the seats, F F F, the hinged dash boards, G G G, and foot boards, H H H, substantially as and for the purposes herein set forth.

3d, In a wagon provided with suitable seats and foot boards, the employment of sectional tent pieces, I I I, substantially as and for the purposes herein set forth.

4th, The combination of the body, C, seats, F F F and E, railing, M, receptacle, L, dash boards, G G G, foot boards, H H H, and folding tent pieces, I I I, all as herein shown and described.

82,473.—LOCK NUT AND TIGHTENER.—H. W. Olney, R. R. Logan and J. B. Fisher, Allegheny city, Pa.

We claim the lock nut and tightener above described, consisting essentially of the coiled spring, e, bent and attached to the nut and the part, C', in the manner shown and operating in connection with a screw, d, substantially as described.

REISSUES.

46,699.—PICTURE CARD FRAME.—Dated March 7, 1865; reissue 3,125.—Garret P. Bergen, Brooklyn, assignee of R. W. Potter, New York city.

I claim, 1st, A card frame for a picture, formed with an opening embossed around its edges, substantially as set forth.

3d, Cutting a hole and simultaneously embossing the border in a picture frame, substantially as described.

74,497.—SCROLL SAW.—Dated February 18, 1868; reissue 3,126.—B. J. Camp, Marion, Ohio.

I claim 1st, Securing or clamping the lower end of the saw blade, B, to the slotted pin, F, by means of the sleeve, a, and grooved set screw, b, the tenon thereof being inserted into a hole in the saw, so that the saw is clamped between the shoulder of said set screw and side of the pin, F, substantially as herein set forth.

2d, The forked adjustable springs, H and I, arranged as described, one above and one below the saw table, for the purpose of obviating the danger of breaking the saw, at the same time as they act as guides for it, substantially as herein set forth.

3d, The up-and-down adjustable guide bar, G, carrying the bent spring, H, constructed and arranged to operate substantially as herein set forth.

58,847.—HARVESTER RAKE.—Dated October 9, 1866; reissue 3,127.—Joseph Dick, Jr., Oswawa county, Ontario, and Eugene Glen, Rochester, N. Y., assignees, by mesne assignments, of Joseph Dick, Jr.

We claim, 1st, The joint ball, g, working within the pulley or case, B, both constructed and operating, with reference to each other, substantially as shown and described, for the purpose of communicating power to and in combination with an automatic rake for harvester.

2d, The hanger, A, the pulley or case, B, and the joint ball, g, all constructed and operating with reference to each other, substantially as shown and described, for the purpose of communicating power to and in combination with an automatic rake for harvesters.

3d, The employment of a continuously-rotating extensible or sliding tumbling shaft, in combination with a vibrating sweep rake, for operating the same, substantially as described.

4th, The arrangement of the sections, G and G', upon the vertical sleeve, f, and the segmental pinions, C and C' upon the horizontal driving shaft, E, of the raker, as shown, so as to constitute, collectively, an entire circle of gearing as shown and described.

5th, The combination of the detachable pulley, T, with the sleeve or ferrule S, having one or more locking pins, 6, substantially as and for the purpose set forth.

6th, The arrangement of the elevating lever, L, ratchet, O', head Q, chain, U, and pulley, V, in combination with each other and brace of the shoe, as and for the purpose set forth.

15,787.—HARVESTER.—Dated September 16, 1856, reissue 3,128.—Division F.—William Gage, Buffalo, N. Y., and Andrew Whiteley, Springfield, Ohio, assignees of William Gage.

We claim the harvester's cutting apparatus, having the shoe, M, the finger bar, N, and the narrow divider, O, or their equivalents, constructed and combined, substantially as herein described, so that this cutting apparatus will have one axis of motion between said shoe and the frame of the machine, to which said shoe is connected, upon which the outer end of said cutting apparatus may rise or fall within the limit allowed it with the undulations of the ground over which it is drawn, without affecting or being affected by the height of said axis or the vertical position of the cutter's driving wheel.

The combination of the hereinbefore described shoe, M, finger bar, N, and narrow divider, O, or their equivalents, in the harvester's cutting apparatus, when one of these portions of said divider, which supports the crop while being cut, is of less width than the other, substantially as and for the purpose set forth.

The combination of the shoe, M, finger bar, N, and narrow divider, O, or their equivalents, in the harvester's cutting apparatus, with the coupling frame, F, or an equivalent thereof, to enable the axis at the inner end of this cutting apparatus to be raised or lowered in respect to the main frame, substantially as and for the purpose described.

The combination of the coupling frame, F, and the pivots, I I, or their equivalents, with the main frame of the harvester, so as to have one portion or end of the hinge between these frames in front, and one in the rear of the axle of the cutter's driving wheel, substantially as, and to obtain the advantages described.

The combinations of the inward projections, l l, and the plate, G, or their equivalents, with the shoe, M, finger bar, N, and the narrow divider, O, in the harvester's cutting apparatus, to limit the downward vibrations of the outer end of this cutting apparatus, substantially as described.

The combinations of the slots, m m, the bolt, o, the washers, o o, and the screw nuts, p p, or an equivalent arrangement of parts, with the shoe, M, finger bar, N, and narrow divider, O, in the harvester's cutting apparatus, to hold up the inner end of this cutting apparatus, substantially as and for the purpose set forth.

The combination of the track clearer, T, or its equivalent, with the shoe, M, finger bar, N, and narrow divider, O, in the harvester's cutting apparatus so as to separate the grass cut by this apparatus from that which is to remain uncut, substantially as described.

The combination of the carrying wheel, P, or its equivalent, with the shoe, M, finger bar, N, and narrow divider, O, in the harvester's cutting apparatus, so as to carry the divider in one of the ways named, substantially as and for the purpose specified.

65,377.—MODE OF DRYING GLUE.—Dated June 4, 1867; reissue 2,971, dated June 9, 1868; reissue 3,129.—A.—George Guenther, Chicago, Ill.

I claim, 1st, Drying glue by wetting solid surfaces with the glue in a liquid state and allowing it to dry thereon in thin flakes, as herein specified.

2d, Facilitating the drying of glue in thin scales or flakes on solid surfaces by circulating air therewith, as herein specified.

3d, In the production of scale glue on solid surfaces, the employment of artificial heat within the solid surfaces, or in the air, or both, as herein specified.

4th, The mode of drying glue in thin scales, by revolving or rotating surfaces, having their temperatures raised either by steam or hot air, substantially as described.

5th, Drying glue on thin revolving disks, as and for the purpose herein set forth.

65,377.—MACHINERY OR APPARATUS FOR DRYING GLUE.—Dated June 4, 1867; reissue 2,971, dated June 9, 1868; reissue 3,130.—B.—George Guenther, Chicago, Ill.

I claim, 1st, The perforated base or air distributer, E, arranged as represented relatively to the drying surfaces, A, and to the current of air artificially thrown thereon, for the purposes herein set forth.

2d, The surfaces, A, and trough, B, with operating means, C, or their equivalents, whereby the surfaces, A, are immersed in the liquid glue and removed therefrom at will, substantially as and for the purposes herein set forth.

40,571.—ROTARY STEAM ENGINE.—Dated November 10, 1863; reissue 3,131.—Metropolitan Engine Company (assignees, by mesne assignments, of Adolph Millocau), New York city.

We claim the pipes, i, l, n, and, o, and valves or cocks, k, k', m, and m', in combination with the ring, c, and pistons acting in the steam spaces, y and z substantially as specified.

54,404.—MANUFACTURE OF PAPER COLLARS, ETC.—Dated May 1, 1866; reissue 3,132.—George W. Ray, Springfield, Mass.

I claim paper, embossed and enameled upon either one or both sides, whether before or after its conversion into articles of wearing apparel, all substantially as herein described.

18,872.—BORING MACHINE.—Dated December 15, 1857; reissue 3,133.—Arcalous Wyckoff, assignee, by mesne assignments, of La Fayette Stevens, Elmira, N. Y.

I claim, 1st, The oblique traversing rests, O O, in combination with the screws, t t, and pinions, u u, when arranged in relation to one another, and used in connection with the dog, Q and chain, P, for the purpose of adjusting the timber to the auger, and holding it firmly, substantially as set forth.

2d, The combination of the shaft, K, worm, I, pinion, J, and rack, l', arranged to operate the traversing bed, E, substantially as set forth.

3d, An annular auger cutter head, the cutting lips of which project in the direction of its rotation, and are formed on a curved and oblique line, substantially as set forth.

4th, The loose independent collar, f, provided with knife edges, g g, to keep it from turning, for the purpose of furnishing a bearing for the head of the auger while in operation.

5th, The sharp annular spur, c, for the purpose of centering and guiding the auger, and at the same time leaving a core of the material bored in the center of the auger, in the manner specified.

80,456.—NUTMEG-GRATER.—Dated July 28, 1868; reissue 3,134.—J. L. Coles, and D. H. Coles, New York city.

We claim a box, A, containing a revolving carrier, D, having a series of chambers with spring followers, which press the articles to be grated against the stationary grating surface, E, which is combined with a receiver, F, all as shown and described.

Also, the combination with the cylindrical box, A, of a series of carriers at angles to each other, so as to leave supplementary chambers, b, substantially as and for the purpose set forth.

Also, the slots or openings, g, in front of the teeth, f, of the grating surface, said slots being formed by actually cutting or leaving out a portion of the metal, substantially as and for the purpose described.

25,253.—FAUCET.—Dated August 30, 1859; reissue 3,135.—Division B.—Albert Fuller, New York city.

I claim, 1st, An elastic plug valve encased in the above described metallic shield, for the purposes set forth.

2d, An elastic plug valve encased in a metallic shield, as described, when the shield is constructed to present a valve face which is transversely or laterally exterior to the plug, in combination with a valve seat or seats to both the elastic and metallic faces of the valve, substantially as shown and described.

63,729.—HORSE RAKE.—Dated April 9, 1867; reissue 3,136.—James La F. King and Wm. W. Watson (assignees of Watson King), Springfield, Ill.

I claim, 1st, The extension of the crank arms, a, on each side of the rake head below the axle, in the crank form, as applied to horse rakes, for the purposes herein shown and in the manner described.

2d, Attaching the traces to the end of the crank or draft arms, a, which are extended below the center of the wheels from each end of the rake head, to make these the point of draft, in the manner herein described and for the purposes set forth.

3d, The forming spring or brace on the butt end of the tooth, said brace being formed with or without a loop, for the purpose set forth and in the manner described.

4th, Attaching the tooth, H, to the rake head, a, by means of a straight or beveled mortise and key, for the purpose set forth and in the manner described.

5th, Attaching the tooth, H, to the rake head, a, by passing the loop over and around the head, for the purposes herein set forth and in the manner described.

6th, The thimble or metal band, g, as a means of securing and completing the brace or spring, formed by the connection of the end of the tooth bent over with the main body or tooth, for the purposes herein set forth.

78,852.—ANCHOR.—Dated June 9, 1868; reissue 3,137.—Frederick Wittram, San Francisco, Cal.

I claim, 1st, Openings made lengthwise in the shank of an anchor, through which arms or flukes move freely to either side, substantially as herein described.

2d, The placing of two or more jointed arms or flukes at different portions of the shank's length, at or about at right angles to each other.

DESIGNS.

3,194.—SPOON HANDLE.—B. D. Deiderhase, New York city.

3,195.—SPIRIT LEVEL.—L. L. Davis, Springfield, Mass.

3,196.—LOWER PORTION OF A GORED SKIRT.—Thomas Dolan, Philadelphia, Pa.

3,197 to 3,199.—STOCKING FABRIC PATTERN.—Thomas Dolan, Philadelphia, Pa. Three patents.

3,200 and 3,201.—CARPET PATTERN.—Israel Foster, Philadelphia, Pa. Two patents.

3,202.—TABLE FORK.—J. W. Gardner, Shelburne Falls, Mass.

3,203 to 3,206.—STOVE.—William Hailes (assignor to John F. Rathbone & Co.), Albany, N. Y. Four patents.

3,207.—TRADE MARK.—F. A. Hasenclever, New York city.

3,208.—TRADE MARK.—Joseph H. Jessop, Cambridge, Mass.

3,209 and 3,210.—FLOOR CLOTH PATTERN.—Victor Meyer, Kearney, N. J., assignor to Edward C. Sampson, New York city. Two patents.

3,211.—CLOCK CASE.—Solomon C. Spring (assignor to Welch, Spring & Co.), Bristol, Conn.

Inventions Patented in England by Americans.

[Compiled from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

2,023.—CARTRIDGE FOR BREECH-LOADING FIRE-ARMS.—Wm. H. Crocker, Boston, Mass. June 24, 1868.

2,421.—CLOSING CANS, BARRELS, ETC.—Edward Jenkins, Havenswood, N. Y. Aug. 1, 1868.

2,565.—ELLIPTIC SPRINGS FOR VEHICLES.—Joseph Palmer, Concord, N. H. Aug. 17, 1868.

2,591.—APPARATUS FOR CLEANING GRAIN.—Simon Howes and Alphus Babcock, Silver Creek, N. Y. Aug. 17, 1868.

2,601.—ROTARY ENGINE.—Frederick Ortlieb, Greenpoint, N. Y., and Edward White, New York city. Aug. 20, 1868.

2,605.—APPARATUS FOR MANUFACTURING FLOUR.—Henry B. Sears, New York city. Aug. 21, 1868.

2,621.—UNITING THE ENDS OF RAILWAY RAILS.—Daniel R. Pratt, Worcester, Mass. Aug. 22, 1868.

2,628.—CARTRIDGE FOR BREECH LOADING FIRE-ARMS.—Samuel Norris, Springfield, Mass. Aug. 24, 1868.

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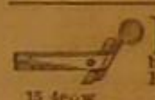

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WASHINGTON, D. C., Sept. 18, 1868.

Thomas Slaight, of Newark, N. J., having petitioned for an extension of the patent granted him on the 24 day of January, 1868, for an improvement in "Padlocks" it is ordered that the said petition be heard at this office on the 14th day of December next.

Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
15 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 9, 1868.

Sylvanus Sawyer, of Fitchburg, Mass., having petitioned for an extension of the patent granted to him on the 24th day of June, 1851, for an improvement in "Machinery for Cutting Rattan," etc., (this application having been authorized by act of Congress, March 2, 1867) it is ordered that the said petition be heard at this office on the 24th day of December next.

Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
15 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 21, 1868.

Joseph S. Winsor, of Providence, R. I., having petitioned for the extension of the patent granted him on the 24th day of January, 1855, for an improvement in "Machines for making Weavers' Harness," it is ordered that said petition be heard at this office on the 14th day of December next.

Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
13 3 S. H. HODGES, Acting Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 23 1868.

Sylvanus Sawyer, of Fitchburg, Mass., having petitioned for the extension of a patent granted him the 3d day of January, 1855, for an improvement in "Machine for Splitting Rattans into Strips," it is ordered that said petition be heard at this office on the 14th day of December next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
15 3 S. H. HODGES, Acting Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 11, 1868.

Jarvis Case, of Lafayette Ind., having petitioned for an extension of the patent granted him on the 16th day of January, 1855, reissued on the 16th day of November, 1858, and again reissued on the 11th day of April, 1866, for an improvement in "Seed Planters," it is ordered that said petition be heard at this office on the 21st day of December next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
14 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 11, 1868.

George W. Hubbard and William F. Conant, of New York city, having petitioned for an extension of the patent granted them on the 6th day of January, 1855, and reissued on the 18th day of September, 1866, for an improvement in "Operating Slide Valves in Direct Action Engines," it is ordered that said petition be heard at this office on the 21st day of December, next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
14 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 7, 1868.

B. F. Brown, Dorchester, Mass., having petitioned for an extension of the patent granted him on the 12th day of December, 1854, for an improvement in "Making Carriage Bodies."

It is ordered that said petition be heard at this office on the 23d day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 9, 1868.

Sylvanus Sawyer, of Fitchburg, Mass., having petitioned for an extension of the patent granted him on the 12th day of December, 1851, for an improvement in "Rattan Machine," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed at this office twenty days before the day of hearing.
13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 9th, 1868.

James E. Simpson of Brooklyn, N. Y., having petitioned for an extension of a patent granted him on the 5th day of December, 1851, for an improvement in "Dry Docks," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
13 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 9, 1868.

Charles Danforth, of Paterson, N. J., having petitioned for the extension of a patent granted him on the 12th day of December, 1854, for an improvement in "Throstles for Spinning Cotton," it is ordered that said petition be heard at this office on the 23d day of November next.

Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
ELISHA FOOTE, Commissioner of Patents.

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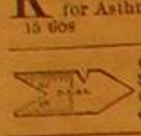

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OFFICE OF THE CAMERON SAW MILLS, Cameron, Pa., July 29, 1868.

J. E. STEVENSON, Esq., 83 Liberty st., New York.

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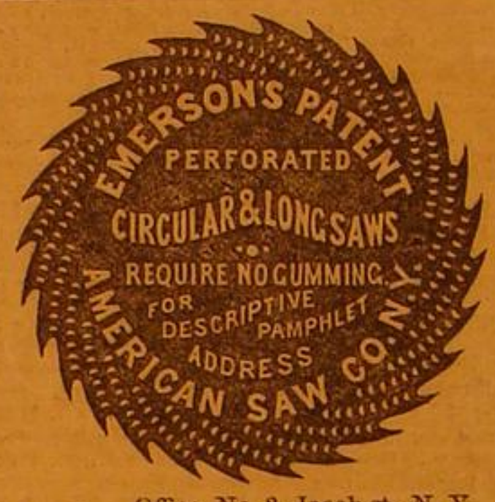

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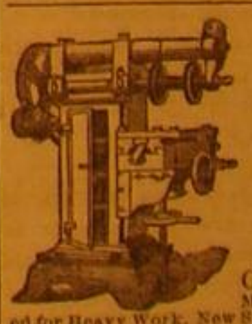

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SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES

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The Mont Cenis Tunnel.

WE present to our readers with this issue of the SCIENTIFIC AMERICAN an engraving representing a drift in the great Mont Cenis tunnel, with the drilling machine used. From *Engineering* and other exchanges we compile an account of this great work.

With the single exception of the Suez Canal, the Mont Cenis tunnel may probably be considered to be the grandest engineering work at present in progress, and it is, moreover, undoubtedly the boldest work of its kind which has ever been carried out, either in ancient or modern times. By its completion the railways of France will be united to those of Italy, and a continuous railway communication, without break of gage, will be established between Calais and Brindisi, a distance of 1,390 miles. Considering the growing importance of the latter port as a point of departure for the Eastern mail steamers, the value of such a system of unbroken communication can scarcely be overrated. At present the Mont Cenis Railway forms the connecting link between the French and Italian lines; but this, although affording far better accommodation than the old diligences, is still open to the objection of causing a break of gage with all its attendant evils, and, moreover, the time occupied in crossing the Alps by the summit line is far greater than that which will be taken up by traversing the tunnel when the latter is completed.

It is now sixteen years since, in 1852, the Chevalier Maus proposed to construct the Mont Cenis tunnel by means of a machine of his invention, which he estimated as capable of boring a mile and a half per annum. It is almost needless to say that such expectations were never realized, and the whole scheme was abandoned until the autumn of 1857, when a commencement was made with the present works.

The Mont Cenis tunnel, although commonly supposed to traverse Mont Cenis, does not really do so, but passes some distance to the west of that summit, the highest point of the mountain chain directly over the line of the tunnel being about 9,700 feet, above the level of the sea, while Mont Cenis, rises to upwards of 11,400 feet above that level. The tunnel is being constructed in a straight line from Forneaux, a village in the valley of the Arc, about 1½ miles from Modane, on the French side, to Bardonnèche on the Italian side of the mountain, the total distance to be traversed being 12,200 metres, or about 7 miles 1,020 yards. At Bardonnèche the nature of the ground did not allow of the tunnel being conveniently commenced at a less elevation than 1,335.38 metres, or 4,381 feet above the sea level, while at Forneaux the entrance has been made at a point 1,202.82 metres, or 3,946 feet above the same datum. The difference of level at the two ends of the tunnel is thus 132.56 metres, or 435 feet, and this difference of level alone would have necessitated a gradient of about 1 in 92 throughout its length. It having been expected, however, that during the execution of the work a considerable quantity of water would be met with, it was deemed advisable to construct the tunnel with a rising gradient of 1 in 2,000 from the Bardonnèche end, this gradient being met near the middle of the length of the tunnel by a gradient of 22·2 per 1,000, or about 1 in 45, rising from Fourneaux. The fall of 1 in 2,000 towards the Italian entrance was, of course intended to give good, drainage to the works in the event of a large influx of water taking place; but hitherto no such event has occurred, nor from the experience already gained of the nature of the material passed through, does it appear likely that it will occur, and the tunnel might, therefore, have been as readily constructed with an uniform gradient throughout, falling from the southern to the northern side. This, however, could not have been foreseen when the works were commenced, and the adoption of a falling gradient towards the southern end may even yet prove to be a useful precaution.

The materials to be traversed by the tunnel are schist, quartz, and compact limestone, and hitherto the points at which the various strata have been found to commence and terminate have agreed very closely with the positions assigned to them by the geological surveyors. Commencing from the French end, the schist was found to extend for a distance of 2,346 yards, and this was bored through at the average rate of 1.26 metres, or rather more than 4 feet per day, a small portion of this length having been excavated by hand labor alone. Next to the schist came 550 yards of quartz which was traversed at the rate of scarcely 2 feet per day; and this was followed by the compact limestone in which the work on the French side is now being carried on at the rate during the month of April last of 2,08 metres, or about 6 feet 10 inches per day—a rate far greater than was at first anticipated. It is expected that the limestone will extend for a thickness of 3,008 yards, and that between the point where it terminates and Bardonnèche nothing but schist will be met with. So far the workings from the Italian end have been made in schist only, and during the month of April last they were carried on at the rate of 1.55 metres, or a little over 5 feet per day.

At Forneaux the compressed air is led through lines of cast-iron pipes from the buildings containing the air compressing machinery to the engineering workshops, and thence to the tunnel itself. The workshops are situated on the hill side above the level of the air-compressing machinery, but considerably below that of the mouth of the tunnel. They are fitted with a good plant of ordinary engineer's tools, most of them made by English makers, and in the smiths' shops there is a 12-cwt. hammer, which is worked by compressed air. The machinery in the workshops is ordinarily driven by a turbine, which is sunk 9 metres, or 28 feet 8 inches below the floor of the machine shop; but in winter, when the supply of the water for the turbine is stopped by the frosts, the shafting is driven by an engine worked by the compressed air. The torrent of the Arc, from which the water power for working the air-compressing machinery is obtained, is, we may mention here, never frozen even in the most severe seasons.

MACHINES AND METHODS OF BORING THE MONT CENIS TUNNEL.

The general appearance of the machines will be seen from the perspective view. The frame of each machine is formed by a pair of bars about 6 feet 6 inches long, these bars having placed between them the 3 inch cylinder by the piston of which the boring tool is actuated. The cylinder is not fixed to the frame bars, but is capable of sliding on them, motion being given to it by a large worm at its hind end which gears into racks formed on the inner sides of the frame bars. The cylinder is 3 inches in diameter, and its piston has a rod about 2 inches in diameter, there being thus but a comparatively small annular area on the front of the piston on which the air continually presses. At the hind end of the frame bars of the machine is placed a kind of miniature horizontal engine worked by the compressed air; this engine driving, through a bevel gear, a square shaft which extends nearly the whole length of the machine above the boring cylinder. This shaft carries a cam which gives the necessary motion to the slide valve which governs the admission of the air to, and its release from the boring cylinder; and from the same shaft the intermittent rotary motion is given to the tool, and also the necessary advance as the hole is bored. The manner in which the advance of the tool, or rather of the cylinder, is regulated, is as follows: The cylinder is free to slide longitudinally on the frame bars, these bars having on their inner sides racks into which a worm, carried on a spindle projecting from the hind end of the cylinder, gears. On this same spindle there is a clutch, which is driven by gearing connected to the square shaft already mentioned, and when this clutch is in gear with the worm, the cylinder is advanced along the frame towards the face of the rock. As, however, the rock is of unequal hardness, the rate of advance is made dependent upon the rate at which the borer penetrates, in the following manner: The clutch by which the worm is driven is embraced by a fork formed on a bar which extends forward past the boring cylinder, and which has at

its front end a finger, which is bent so as to catch on ratchet teeth formed on the tops of the frame bars, as shown in our engraving last week. Supposing the clutch to be in gear with the worm, and the machine to be at work, the cylinder will be gradually advanced along the frame bars; but the clutch being held by the bar just mentioned, and the front end of this bar abutting against one of the ratchet teeth, cannot follow the cylinder, and consequently after the worm has made a couple of turns or so, the clutch is worked out of gear and the cylinder becomes stationary. As the boring goes on, however, the piston makes a longer and longer stroke out of the cylinder, and eventually a projection on its end raises the front end of the finger bar out of gear with the ratchet tooth, against which it abuts. As soon as this takes place a spring behind the clutch forces the latter forward into gear with the worm, and the advance of the cylinder again goes on until, the end of the finger bar coming against the next tooth, the forward motion of the clutch is again arrested until it gradually works itself out of gear. Each boring machine weighs about 6 cwt., and as the wear and tear to which they are exposed is very severe, it is found necessary to keep from three to four machines in reserve for each one at work.

The boring bars employed are of various forms and of various diameters. The Z and double Z or crown borers are those most used, but for some kinds of rock other forms are found preferable. The holes generally bored are about 1¼ inches in diameter, but some are much larger. In working through some of the very hard quartz it was found that the shots flew back from the ordinary holes without producing any disruptive effect on the rock, and the plan was therefore adopted of first boring several holes 4 inch or 5 inch in diameter and then disposing some ordinary holes round these. When the charges in the ordinary holes were fired the portions of the rock between them and the central hole were blown out, and a cavity thus formed around which other shot holes were bored. The borers used for the 4 inch and 5 inch holes are of similar form to smaller bars, and, like them, they are worked by the boring machines, but at a slower speed.

ON THE INFLAMMABILITY OF PETROLEUM AND SCHIST OILS.

Dr. Robert Peltzer has lately made experiments on the inflammability of different products of distillation which were derived from Pennsylvanian petroleum and bituminous schists from Autun, departments Saône and Loire, in France. The results of the same are the following:

PETROLEUM. Density.	Inflammability. Takes fire at
0·643	-5·8° F.
0·686	-5·8
0·700	- ·2
0·740	+59
0·748	+60·8
0·750	+62·6
0·760	95
0·775	113
0·788	122
0·792	167
0·805	194
0·822	250
0·831	293
0·848	1·8
0·850	1364
Crude petroleum of 0·802	59
Heavy oils from the distillation of kerosene	343·4
Paraffine of melting point of 129·2° F	429·8

SCHIST OIL. Density.	Inflammability. Takes fire at
0·769	+0·4° F.
0·791	66·2
0·805	95
0·814	118·4
0·823	140
0·841	176
0·851	86·8
0·880	208·4
Portion solidifying at 59° F	206·6
Crude schist oil of 0·882	82·4

The oils were heated in a small capsule over a water or paraffine bath, a thermometer being inserted in the oil and a thin burning wick being held over the same. The petroleum oils which were experimented upon were very differently obtained; a part of them was gathered directly from the cooling worms in refineries, others were obtained by fractional distillation in small retorts, and still others by evaporation of specifically light mixtures.

The first two samples of the density of 0·643 and 0·686 took fire at —5·8° F.: henceforth the inflammability diminishes until the density of 0·822 is reached. From this point we see it again increase. This remarkable fact is easily explained when we consider that the high temperature which is necessary to distill the oils of 0·822 is sufficient to produce a partial decomposition of the higher boiling oils in the retort. This admission is sufficiently confirmed by the experiments. When the distilled oils had reached the density of 0·822, the fire under the retort was drawn out. In producing a light oil of 0·8, distillers generally gather only the portions which come over up to this point; the first fractions which are used with the illuminating oil possess a specific weight of 0·750; the mixture does then not take fire below 96·8° F.

The remainder in the retort may be heated to 343·4° F. before it is influenced by a burning wick. When, however, after the distillate had reached the specific weight of 0·822, the heat was increased, as it is done for the production of lubricating oils, the inflammability also increased, as is seen from the foregoing table.

Refined paraffine of a melting point of 129·2° F. could be heated to 429·8° F. It then took fire, but without a prior decomposition being noticed, which obviously had taken place in the distillation of the heavy oils and crude oil-containing paraffine masses.

The schist oil samples were obtained from a distillation on a small scale. The same was carried out in a cast-iron retort of 2½ gallons capacity on naked fire. The oils were purified and from Autun. It is striking that the latter are a great deal more inflammable than the petroleum oils of the same density. Prof. Marx, in Stuttgardt, also indicates the inflammability of a schist oil, which he does not designate further, as being at 63·5° F.

It is highly probable that a similar decomposition goes on in the distillation of schist oils at a high temperature, only in a less striking manner than is the case with petroleum. Unhappily the choice of the experiments was very limited, and he particularly lacked the distillates from the crude heavy oils for the production of lubricating oils otherwise the decomposition of the schist oils could have been more precisely determined. Upon this decomposition a process could certainly be founded for changing the heavy petroleum oils by a high heat (at least partly) into illuminating oils, as Mr. Breitenlohner, in Chlumetz, Bohemia, has already done with heavy neat oils.

From the foregoing table we notice a diminution of the inflammability with the increase of density, in case no decomposition has yet taken place by too high a temperature; but even an approaching relation between these two points is, however, not perceivable. If the greater or less inclination of the oils to inflame was simply dependent upon the boiling points of single fractions, which would represent more or less constant mixtures of hydrocarbons of the series, C_{2n} H_{2n+2}, as isolated by Cahours, Pelouze, and Schorlemmer, then a fixed relation between the inflammability and density would be the necessary consequence. This relation is, however, very probably concealed by a different degree of absorption of the single fractions for the highly inflammable gases which are to be found in the oils. A fraction which holds a certain quantity of gas possesses also a corresponding inclination to inflame.

For making the crude petroleum applicable and perfectly safe for the heating of steam boilers, it would be necessary to separate all the oils until the density of 0·783 is reached, and then to free it from the absorbed gases. Though oils may yet be present which are inflammable at from 122° to 167° F., their percentage is so small that the fluid will bear a heat of 176° to 212° F. without there being any danger of explosion. The oils below the density of 0·783 could be sold partly as kerosene partly as essence for the so-called magic lamp.—*Dingler's Polytechnic Journal, Vol.* 189.

WHAT MAKES THE DIFFERENCE.

Almost simultaneously there have recently appeared, in a popular monthly magazine, and a daily paper in a neighboring city, articles upon the labor question. The magazine article is an able review of the subject, from a philosophical stand-point. The articles in the daily consist of a description of the life led by clerks in New York, and the tyranny of their employers, with confirmatory correspondence from a fancy-goods clerk, who has had a bitter experience, if we are to believe his own account, which we see no reason to doubt. If late in the morning, five minutes, or if three minutes' late from his hasty lunch, at noon, he is docked one fourth of a day, while he is obliged to work during the time for which he receives no pay. He has thus been required to work fourteen hours, for only half a day's wages. His evenings are expected to be spent in drumming up trade, for which he gets no thanks or pay. He says his experience is that of other fancy-goods clerks when traveling. "His labors commence at sunrise, and are ended at twelve o'clock at night, or perhaps one o'clock the next morning, just in time to jump on the train, sleep in his seat, and at daybreak he is in the next town, to go through the same wearing routine." He follows these statements with thanks to the paper that has taken up the cause of oppressed clerks, and makes the following pathetic appeal:

"I speak from experience. This I have done for four years. I have traveled, with valises in hand, through rain or shine, hot or cold, from Portland, Maine, to St. Paul, Minnesota; from Grand Rapids, Michigan, to Selma, Alabama. For my services I draw the stupendous sum of nine hundred and fifty dollars per annum—and this from one of the largest notion houses in the United States. You have spoken in our behalf. You have chosen to devote two columns of your paper to a purpose which must be philanthrophic in its motive, for favors like these are never bought by workingmen. I thank you from the bottom of my heart for the voice you have raised to befriend us as a community. I pray it may never fail until it has accomplished something towards its purpose, so that a man will not be ashamed to see his name in the directory stigmatized 'Clerk'—which now almost signifies candidate for the poorhouse."

Coupling this with the following figures from the magazine article to which we have referred, we shall get some additional light upon the subject:

"The census of 1860, shows in the State of New York 49,597 clerks, to 11,745 masons! And besides this is another curious fact, that, while the wages of the masons are $4 50 per day, those of the clerks do not average over $2 per day! See, also, how the non workers count with the masons in other departments: 11,745 masons only in the largest State of the Union, with a population of 3,880,735; but there are 3,679 barkespers, 6,127 drivers, 5,592 lawyers, and 5,235 clergymen. . . . . .

"The three bricklayers' unions of New York city contain some four thousand members, each of whom pays an initiation fee of $25, and a monthly due of twenty-five cents. If injured at his work, the injured member is allowed $6 per week while disabled, and at his death his family receives $60. So far they are benevolent institutions; but in the event of a 'strike,' or other important movement, 'this union shall have power to levy upon its members for extraordinary purposes such tax or sum as may be at the time necessary, which tax shall not at any time exceed the sum of ten per cent on the net earnings or wages each member may be receiving at the time of such assessment.' This may and must bring in a vast sum; and I learn from one of the officers that, in this great strike at New York, in addition to the $35,000 in their treasuries, they have received from other unions and contributions some $150,000, a large portion of which has not been expended, or had not been at the end of the sixth week of the strike."

The magazine writer thinks he has expressed the secret of power in the trades unions, when he says, the demand for their labor, and the high wages which are consequent upon the demand, enables them to make up a large fund, and to help each other when occasion requires it; and, as far as that goes, he is right. The powerlessness of the clerks is also considered by him to result from their inferior wages; and this is also right, so far as it goes. The reason for the scarcity of mechanics and farm hands, and the glut of clerks, is attributed by him to the disreputable character of manual labor.

"Work is disreputable—is it not so? Else would not these thousands of poor clerks gladly leave two dollars a day to get five? Disreputable means, not in esteem, not honorable. Now, I ask, is it practicable for any bricklayer in this city of New York, or in any city known, to enter, to be one of what is called 'good society?' No matter how well educated or well bred he may be, the fact that he is a bricklayer does forbid his being accepted as a friend and equal by the men and women of good society. It is not easy to understand why stock gamblers are accepted in good society, master masons and carpenters not; why clerks at two dollars per day are marriageable, masons at five dollars a day not; unless that they are able to keep smooth hands and wear good clothes week days as well as Sundays. No one would claim that the clerks are more intelligent, more moral, more capable, better members of society than the masons; but the facts are as I state them."

Now, if these things are so, our nation is in a sad plight.

> "Ill fares the land, to hastening ills a prey,
> Where wealth accumulates, and men decay."

The effeminacy which leads to a dislike of honest, manual labor, never exists except at the expense of manhood. There is a fashionable class in this country, doubtless, to which neither the mason, with his five dollars per diem, nor the clerk, with his two dollars, would be eligible. Beyond this we know of no society where a clerk would be received, and a mason or carpenter excluded. It may exist, but we have not discovered it. Our magazine article does not locate this society, or define its boundaries. Certainly, it is not in rural districts; and, if in cities, where is it to be found. Evidently, if it exist at all, it must be among that class which is the pest of all large towns—the class who gamble, pick pockets, sell lottery tickets, keep intelligence offices, and contrive to keep up a sort of style upon the ill-gotten gains of such and similar occupations. But our author does not, of course, mean this class, when he speaks of good society. We are inclined to think the society he means to be a creation of his own imagination.

But if work is not disreputable, whence the glut in those professions which do not involve manual labor? A powerful cause, entirely overlooked by this writer, exists in the exaggerated ideas which prevail in rural districts in regard to the pleasures of city life, and the chances which exist in large towns for rapid advancement in all professions. Instances of extraordinary success are circulated far and wide through the country papers, while the numberless wrecks of health and morals, or the innumerable disapointments, privations, and humiliations to which the larger portion of young men who go to cities in search of employment, must be subjected, are unrecorded. It is true that men of extraordinary talents, find greater scope and larger remuneration in cities than in country towns. But all youths have not extraordinary talents, and the advantages which are secured by a metropolitan life are only to be obtained by pluck and perseverance, perhaps so severely tried ere success is reached, that the prize, when at last it is grasped, comes too late to be enjoyed. The country lad, as he follows his plow, or sits resting beneath the shade, after a day of physical toil, cons over the stories which his cousin from the city has told him, and its splendor and fancied ease, seem so alluring in comparison with his life of healthful labor, that he flies toward it like a moth to a candle, and has his wings singed. In the majority of cases he never recovers himself. He becomes enamored of the theaters, the concert halls, and the many other agencies always found in a city, which corrupt his tastes if not his morals. He becomes effeminate, neglects mental improvement, and gradually degenerates into a miserable, worn, and whining drudge, like the clerk in the notion house, who so piteously makes his moan to the Brooklyn daily.

Out upon you, man, if you have enough left in you to call a man! What business have you to be a fancy goods clerk? Go into the country, and swing an axe, or into the forge, and wield a the hammer, and recover your lost manhood. Don't sit here, whining, like a whipped puppy, about your insufficient salary. You are getting now more than women ordinarily get. Before we would engage in such a paltry occupation, we would carry a hod. What were your muscles made for? Why do you disgrace your sex by peddling dolls and baby toys, when you should have been a producer of wealth by your labor or your brain? We have only the sympathy for you that arises from a consideration of your weakness. You have not force of character enough, neither have your class, to make an effectual strike. You have not the brain to organize, nor the physical power to endure. The bricklayer has both, and so he can hold out when he sets about it. This is the main source of his power. His habits of life make him both clear headed and plucky; and although we doubt the wisdom of such organizations as bricklayers' unions, we admire the courage and manhood of the bricklayer, as much as we hold your weakness and occupation in contempt.

Fifteen trains, averaging 35 cars each, and carrying an average of fourteen thousand bushels of grain each, pass daily over the Chicago, Burlington, and Quincy Railroad.

MIDDLETON & HALLER'S SAFETY HORSE HITCH.

The art of quickly making a knot in a halter or grog rein is one that must be learned, and there are occasions, as in severely cold weather, when the benumbed fingers of the most expert bungle. The little device herewith illustrated prevents this annoyance, and it is as cheap as a ring, hook, or staple, and can be as easily attached to a post, manger, trough, or other object. Beside the two screws by which it is secured, the whole contrivance consists of only three pieces of com-

Fig. 1

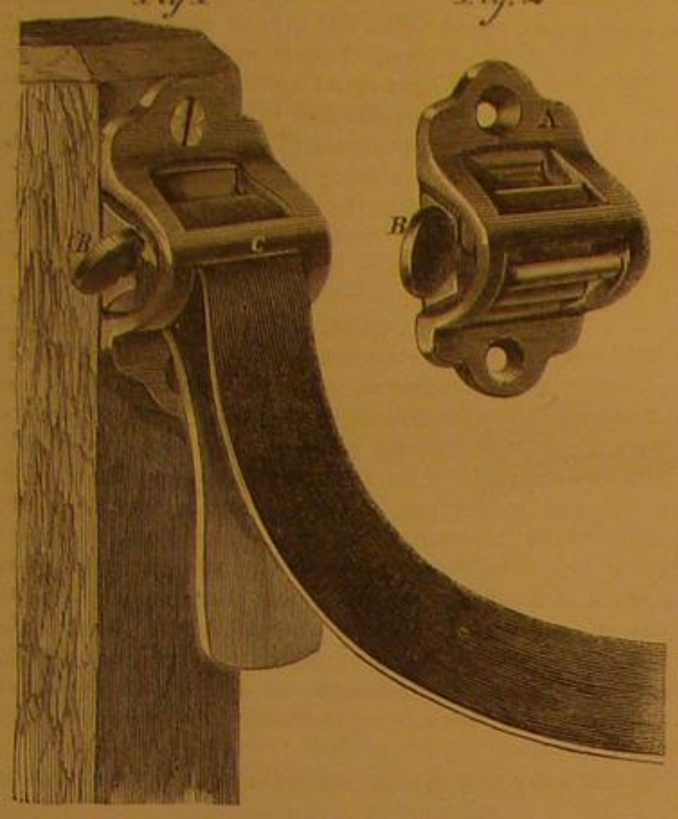


Fig. 2

mon cast iron, requiring no preparation, after casting, for use except cleansing them from sand by means of the rattle box or by hand. The parts may be seen in Fig. 2. A is the shell, and B the tongue, which is held in place by a central back piece fitting into the rear of the shell. Fig. 1 shows the hitch attached to a post and holding the end of a strap. This is inserted under the bar, C, while the tongue is in a vertical position, as in Fig. 2, and then a light jerk partly revolves the tongue, bringing its lower edge against the strap and confining it between the tongue and the back piece, which is corrugated. To release the strap the tongue is turned by the thumb piece, B, to a vertical position and the strap pulled out. Among the advantages claimed, and which are obvious on examination, are its cheapness, costing but a few cents; its entire reliability, as the greater the strain on the strap the stronger it will be held; its durability; ease and quickness of handling, a woman or child being able to hitch or unhitch a horse instantly, and its adaptability to all circumstances in which it is desirable to hitch an animal. It may be used also to fasten clothes lines. Patent issued Aug. 11, 1868. For State, county, or manufacturing rights address H. C. Demming, assignee, Harrisburg, Pa.

REPEATING FIRE-ARMS.

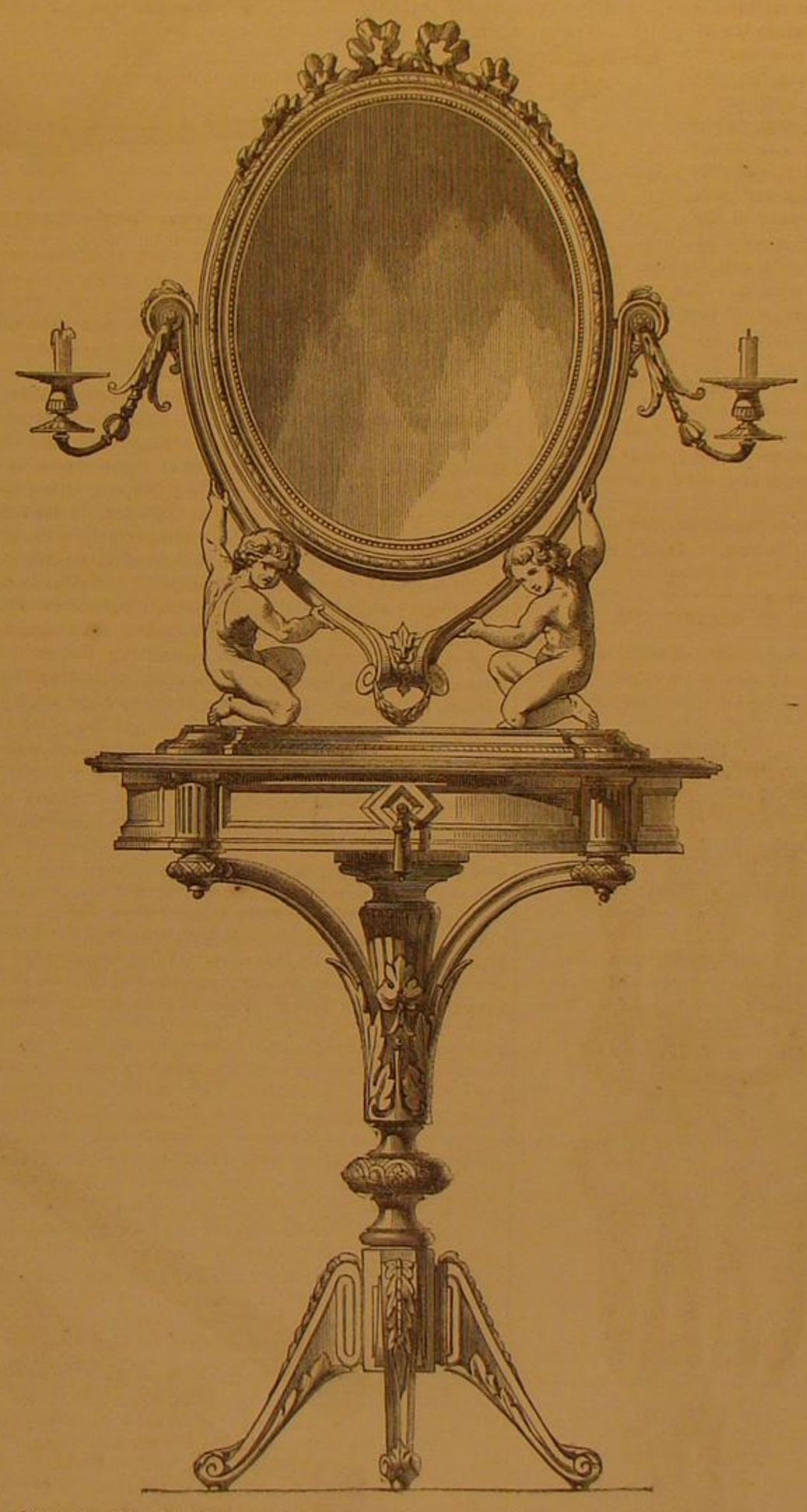
It is not too much to affirm that the day of muzzle-loading fire-arms for war purposes is passed. Indeed, the breech-loader seems destined to give place to the repeating rifle, which, however rapidly it may be emptied, shall require but a fraction of a minute to be loaded. All time spent in loading in battle is time absolutely lost, during which the soldier is a defenceless target. That piece will best subserve its purposes, which—other things being considered, reliability, safety, and strength—shall require the least time to load and discharge, with accuracy, the greatest number of shots in a given time. Accuracy, power of penetration, range, etc., are independent of the mechanism necessary to rapid firing, and may be possessed by the muzzle loader as much as by those pieces which may be rapidly discharged. There is nothing in the preservation of these qualities which preclude the possibility of a quick firing piece.

The mechanics of this country have produced, probably, the best small arms, and the best machinery for their manufacture, in the world. This broad statement is borne out in the one case by examining the published results of practice with European arms, and the results of competitive trials between rifles of American and European manufacture; and in the other case by the fact that in only one of our establishments building gun tools—that of Pratt, Whitney & Co., of Hartford, Conn—the bulk of their work for two years past, and their prospective work for a year to come, has consisted in the filling of orders from continental powers for gun-making machinery.

We have lately examined the Winchester repeating rifle, manufactured in New Haven, Conn., which was submitted to a series of trials by the Federal Military Commission of Switzerland, appointed to test and report upon a suitable arm for the troops of the Confederation. The result was a recommendation of the Winchester gun, for the arming of the Swiss sharpshooters. When it is considered that the Swiss are unexcelled as riflemen, the significance of this selection cannot be misunderstood. The piece is an improvement on the Henry rifle, so well known and appreciated by sportsmen, consisting mainly in an automatic arrangement for discharging the cartridge shell, and the method of filling the magazine, which extends along the length of the barrel, on the underside, is closed at the top, and fixed to the barrel. In the ordinary rifle this will hold twenty-two cartridges, which may be delivered to the barrel, fired, and the empty shell dislodged by only two motions of the right hand. The magazine is charged at the side, by the lock, and, whether full or empty, the piece may be used as a common breech loader. Thus, while the soldier or hunter may carry over twenty charges for cases of emergency, he can use his piece, at the same time, as a breech-loader, retaining the magazine charges. The breech contains a cleaning rod for the barrel, in four sections, easily put together for use, and detached for replacement. The rifle is elegant in appearance, compact, strong, and of excellent workmanship. On examination, we find its working parts very simple, and not apparently liable to derangement. As yet we have not tested its accuracy, range, or penetration, but have heard good accounts of its good qualities in this respect by those who have.

DESIGN FOR TOILET TABLE.

We herewith publish from the *Workshop*, a design for a toilet table. The study of such designs must be beneficial to all who are interested in the arts of cabinet making or wood carving. This one in particular will attract attention for its delicacy and richness. A general fault in designs for rich furniture is that they are overdone. The one we now present has a unity pervading the entire composition. At the same time it is free from all meretricious decoration. It will repay study.



ENGRAVING FOR CALICO PRINTING.

On page 317, Vol. XV., SCIENTIFIC AMERICAN, we described the process of engraving rollers for calico printing as generally employed some years ago. Much of the engraving then done was by means of "dies," "mills," "clams" (vulgar for "clamps?"), and "machines;" the die with the recessed pattern, giving its engraving to the mill in a raised pattern by means of the clams, and the mill by the machine impressing the pattern on the copper roller.

Beside these methods there was the talent of the bench engraver needed; not only he who first, from the "sketch" engraved the steel dies, but he also who by means of transfer patterns engraved the printing (copper) roller itself. Almost all these, as well as the "clammer" and the "machine engraver," have been superseded by a simple machine worked by girls. Engraving was once a costly process, and engravers received very large wages. The term of apprenticeship was not less than seven years, and the rules that governed the craft—employer as well as employed—very strict.

All this is changed, and engraving, except in preparing the patterns, has become mainly a series of simple mechanical processes. The designer must, as before, make a sketch—an outline—and also a pattern—the device in colors. From these the engraver copies on a plate of zinc the pattern, generally enlarged five times. The lines of the pattern are deeply sunk into the metal, with upright or abrupt edges forming the outline. This is a guide to the after process of marking the roller for engraving, and the colored pattern is placed before the eyes of the operator to enable her to see if her manipulations are correct.

It would be difficult to describe the machine used for this purpose without diagrams, but we will endeavor to convey an idea of its *modus operandi*. The roller to be operated upon is covered evenly with the usual etching ground or resistant, its surface being perfectly plain and smooth. Mounted on a mandrel and placed in the machine so that it may revolve freely, the roller with its mandrel is connected to a vibrating frame having an arm, in one end of which is a fine diamond that may be brought in contact with the face of the roller. The deeply engraved zinc pattern is fixed to a table in front of the operator, who guides a point attached to the vibrating frame across the engraved depressions of the pattern; the arm holding the diamond following each movement and scratching through the etching ground, laying bare the copper, and forming the pattern, reduced to one fifth the size of that on the zinc plate. This process is repeated until the roller is covered with the pattern reproduced many times. The after process is the etching the same as that heretofore employed. The roller is suspended on journal boxes in a trough containing diluted nitric and sulphuric acids and revolved. It will be seen that wherever the diamond has scratched through the etching ground the acid will act upon the copper, while the unengraved or unscratched portions will not be affected, the copper being defended from the acid by the resisting ground. The hatcheled or "slashed" ground of the engraved zinc pattern is faithfully reproduced by the diamond in the machine and as faithfully preserved in the process of etching, so that when completed, the engraving on the roller is as perfect in every respect as that done by means of the mill and machine.

One would suppose that this simplifying of the before costly processes of engraving would have greatly cheapened the cost of calicoes, but the price of prints in the market does not seem to favor that idea.

Sir John Franklin.

A clue to the mystery enveloping the fate of Sir John Franklin and his fellow voyagers amid the ice-bound regions of the Arctic zone, seems to have been discovered. By the recent arrival from the Polar regions of Dr. Goold, of Dublin, late and interesting intelligence is afforded respecting the search now prosecuted by Captain Hall for traces or remains of the *Erebus* and *Terror*, and their crews. In August, 1867, Captain Hall was at Repulse Bay, preparing an expedition to King William's Land, where, from information obtained from the Esquimaux, it seems, beyond doubt, that important records, and some relics of the Franklin expedition are still preserved. The point to be reached was four hundred and fifty miles north of Repulse Bay, and in a country, the inhabitants of which were known to be hostile to Europeans and to the Esquimaux, living at Repulse Bay. It was the opinion of the latter, who are known as King Albert's followers, that Franklin's men had been killed by King William's men. Accord-

ing to native information, the last six survivors of the party built a cavern or rude vault of stones,and deposited it it some documents and such articles as they had no use for, or would be an incumbrance to them in their journey southward. It is Dr. Hall's object to reach this depository, and from his well known reputation for intrepidity, energy, and endurance, it may be presumed that no dangers or hardships will deter him from his purpose.

It will doubtless cause a thrill of mingled surprise and sorrow to learn that, after all that has been done to discover the Franklin expedition, two of its members survived to as recent a period as 1864. These were Captain Crozier and a steward of one of the lost vessels, who died near Southampton Island while endeavoring to make their way to that place, in the belief that they would there find a whaler which would carry them home. Dr. Hall is confident of the identity of Captain Crozier with one of the men described to have perished, and has in his possession several articles that belonged to him. The fate of the two unfortunate men, who, after eighteen years' wandering through the Arctic wastes, had so nearly reached a place within reach of civilized man, forms one of the saddest chapters in the melancholy and mysterious story of the lost expedition.

From the New York Mail.

TYPES—WHAT MACHINERY CAN DO.

Type-setting by machinery has been a long-wished for and anxiously expected development of the printing business, toward which men have been working for forty years. It will surprise many to learn that there have been sixty patents granted for this purpose, thirty-five of these being in Old England, where William Church, the pioneer in this movement, obtained his first patent in 1822. Our Yankees have, however, as usual, taken off the prize. The only type-setting machines actually in use are the four of Mitchell's patents used in Trow's establishment, and one of later invention at John A. Gray & Green's. The former, however, is a very crude arrangement, the type being arranged in vertical piles and dropped on movable tapes by the pressing of the proper key. The key-board is like that of a piano, minus the black notes, and the rest of the machine gives the appearance of a horizontal harp. The *Continental Monthly* was set up entirely by these machines—whether its death was owing to this or not we cannot say.

FELT'S MACHINE.

The credit of this machine, however, belongs to Brooklyn. One of the best known mechanical type-setters is that of Mr. Felt, of Salem, Massachusetts. He worked long and faithfully at his self-imposed task, and obtained his first patent in 1854. His machine was eight feet high, and fearfully complicated—it attempted, however, to "set," justify, and distribute. The type-setter has, we believe, been aoandoned, and Mr. Felt is now at work upon a justifier to complete the work of the Alden machine.

THE ALDEN TYPE-SETTER.

This was first devised by Timothy Alden, an immigrant from Massachusetts, in 1840. He had a little workshop in this city—we think in the old Harlem depot—where he planned and worked till 1857, when the Alden machine was patented. He had so devoted himself to his idea, that it finally got the better of him, wore him out, and in 1859, two years after his success, killed him. A nephew of his, however, Mr. Henry W. Alden, took up the matter and formed a company, which still exists. Mr. Chas F. Livermore, is the president; Mr. Josiah Low, the vice-president; Andrew V Stout, treasurer; and Mr. Alden, treasurer. Since Mr. Timothy Alden's death, many mechanical and most important improvements have been made by Mr. J. T. Slingerland, who has brought it to its present state.

WHAT THE MACHINE IS.

The present machine, one of which is on exhibition at the manufactory of the company on Tompkins Square, is entirely horizontal in plan and presents the appearance of a table about three feet high. The compositor sits at a cylinder key-board, on which four rows of keys are arranged vertically. These communicate directly with eight rods, and by means of "permutation," every type is corresponded to by a different combination of some of these rods. Thus one letter-key pushes the seventh and eighth, another only the fifth, another the first, third, fourth, and seventh, and *so on*. These rods act on the revolving wheel at the back of the machine, which is armed with one hundred (vertical) rows of eight movable pins each. One row of the pins is pushed out to correspond with the communication of the rods at each touch on the key-board. Around this wheel, in a three-quarter circle of six feet diameter, are rows of type arranged in radii of the circle, under each of which is a key corresponding to the permutation of the pins for that letter. When a certain letter is called for on the pins, they strike this key and the letter is pushed out from its channel and taken up in its proper order by little fingers on the revolving wheel, and with a long row of its fellows is pushed out just behind the key-cylinder at the front.

THE OLD AND THE NEW.

In the old machine, the type had to be made of thirteen different thicknesses and especially for the machine. By this machine the ordinary type are used, after having been nicked on one side to correspond with the respective combinations on the pins. The old machine contained merely in its key-board over thirteen hundred pieces; this key-cylinder contains one hundred and thirty, while the whole apparatus at present contains only twelve hundred pieces, all told. The machine, with one person at the keys and one to justify—that is, arrange the words in lines of the proper length and put the necessary space between—runs off four thousand ems an hour, meanwhile distributing as much. This is the work of five ordinary compositors.

DISTRIBUTING.

The distributing process is almost exactly the reverse of the composing, but is altogether automatic. The "dead" matter is placed on a bed to the right of the key cylinder, and is taken up line by line as each is exhausted. The types are taken up by distributing transits in the revolving wheel, and, by means of the nicks, registered as before, transferred to the channel whence each started. Extra spaces, etc., placed in during justification, are tipped out at the end of the channels. All unnicked type are thrown out into a separate box, italics into another.

FURTHER IMPROVEMENTS.

A full font of type, accents, italics, small caps and all, contains 355 pieces. Of these the machine sets up only the ordinary small letters, and full capitals, the figures and ordinary signs. It is, therefore, scarcely available for newspaper work, but will probably some day be generally used for books, where there is plenty of time and a good deal of uniformity. Several books have, indeed, lately been reprinted thus for the Messrs. Appleton. The machines at present cost $2,500 each. The great objections are first, their expense; secondly, their complication; thirdly, the difficulty of supplying fresh type when one letter is especially called for. Mr. Slingerland, who keeps up a wonderful thinking about these things all the time, proposes to obviate these difficulties by building two machines, one for composing and one for distributing, which will be much simpler and will cost but $1,200 for the pair.

A STEREOTYPE MACHINE.

A crude machine, which, however, contains the germ of a process by which most of our printing will some day be done, was exhibited a year or two ago in Grand street by a man named Nelson. An apparatus on the same principle was also exhibited by some one at the Paris Exposition. In this but one type of each sort is used, which is arranged at the end of a key lever, and imprints itself in the proper place on a bed of clay moving automatically. This, when completed, is served as the ordinary plaster casts for stereotyping—the liquid metal is poured in, and in a few moments we have complete stereotype plates. The work turned out was not very good, but as the idea has not yet been worked up, and the machine will be cheap, simple, and quick, we think there is considerable ground for our prophecy above.

THE STORY OF A STRIKE.

The only instance, however, in which machinery has been used on a newspaper for composition was in the case of the *Tribune*, which had an Alden machine in use for a short time some years ago. The *World* has lately tried reducing its composing expenses by the use of female labor, but without much success. Sometime since, the Brooklyn papers, the *Eagle* and *Union*, refused to concede the rise demanded by their compositors, from 37 to 40 cents per thousand. A week's notice was given, after which the compositors struck. The *Eagle*, being of the same politics, sent over to borrow matter from the *World*, and immediately after issuing would send their miscellany across the street to the *Union*, and thus both papers, though with great difficulty, were published.

GIRL COMPOSITORS.

The *World* compositors didn't relish working against their Brooklyn brethren, and after due notice struck. At that time this journal was set up in great part by females, a couple of dozen being employed. They were payed only ten cents a thousand less than the males—that is, forty cents They, however, found difficulty in reading manuscript, and even with reprint matter earned on the average but six to seven dollars a week, where men averaged at least twenty dollars. There were but two or three good compositresses among them, and the experiment has been given up as regards newspaper work. They, however, prevent the success of strikes, and for this reason the Typographical Union proposes to admit them and to demand for them exactly the same price as for men.

ABOUT SLUGS.

But to return to our composing-room. Each compositor is distinguished, not by his name, which is dropped (except on pay day) at the outer door of the office, but by a number or letter. Mr. Brown is no longer Mr. Brown, but "Slug A" or "Slug 1," Mr. Jones is "Slug B," and so on. Each morning paper office has, beside several assistant foremen, a day foreman, a night foreman, and a foreman *par excellence*. The foreman on duty receives each article as it comes from the editorial rooms, and cuts it into "takes," portions which occupy a compositor for about half an hour. The article is designated by a letter, and each "take" is numbered according to its order and given out to the compositor in the order in which they finished the last job. He puts his "slug," a piece of heavy type metal, which prints his number or letter, at the top of his "stick," and goes to work. Thus sometimes fifty compositors may be at work at the same time upon one article, or there may be a dozen articles running through the office at once.

CORRECTING PROOFS.

When a compositor has finished his "take," he puts it on the "galley" (which is merely a long, brass lined, flat receptacle, a little wider than the column) in its proper place. Another man then "pulls the galley" as soon as it is full, that is, takes a proof of the matter therein, which goes to the proof-readers. These read it by the sense, if it is not specially important, or compare it with the "copy," if it is an editorial or something of similar moment, and it then goes back to the galley man. According to the "four error" system in vogue at present, the first "slug" on the galley who has made the first error in his work is called to correct. He accordingly corrects not only his own work but continues until he comes to another set of four errors in one take, when that compositor is called—so on through the rest of the galley. Sometimes the standard is six errors, sometimes more allowance than this is made. A compositor is bound to correct his matter without other charge than the original price of composition, and this is where a skillful workman finds the advantage of making few mistakes.

"OFFICE CORRECTIONS."

After this correction a "revise"—that is, a second proof—is taken, and the "reviser" compares this with the corrected first proof. Our large morning dailies employ usually about half-a-dozen readers and one or two revisers. The editors also often correct their own matter. If they make any change from their original manuscript, these are designated "office corrections," and distinguished by a pencil line drawn entirely around them—"ringing" it is called—and for these the compositors are paid by time.

"MAKING UP."

The matter having been re-corrected the paper is "made up"—that is, the articles are arranged in their proper place and order in the "forms." This is done by one of the foremen, sometimes at his own discretion, sometimes by a written memorandum from the editorial rooms, sometimes under the personal supervision of an editor. The matter on the galleys is well dowsed with water to make it stick, a few lines of type are then carefully transferred, leads taken out or put in to hit the bottom of the column properly—leads, by the way, are the narrow strips of metal, placed between the rows of type, whence probably "leaders," which are usually so treated—dashes are properly sprinkled throughout, and finally, the page filled out, the matter is "locked up" by wedges and screws and is ready for the press.

Editorial Summary.

Caveats.—Whenever an inventor is engaged in working out a new improvement, and is fearful that some other party may get ahead of him in applying for a patent, it is desirable, under such circumstances, to file a caveat, which is good for one year, and during that time will operate to prevent the issue of a patent to other parties. The nature of a caveat is fully explained in our pamphlet which we mail free of charge.

The "New York Mercantile Journal."—This valuable paper appeared this week in a new form and dress, which gives ample evidence of a well-earned prosperity. It is one of the most valuable papers of its class, containing weekly market reports of nearly every commodity which is susceptible of quotation, beside much matter of solid information, of interest to business men. The names of first-class houses in every line of trade, which appear in its advertising columns, give assurance that its merits are appreciated.

Prof. Zenger, of Prague, is exhibiting to the British Association an automatic telegraphic apparatus, by which he proposes to secure correctness in the telegraph signs by mechanical means, independently of the hand of the operator. No details of this machine have been yet given from which we can get an idea of it. It is simply announced that no change in the management of the Morse apparatus is required beyond the removal of the key and the substitution of the automatic apparatus.

To Clean Silver Plate.—Fill a large saucepan with water; put into it one ounce of carbonate of potash and a quarter of a pound of whiting. Now put in all the spoons, forks, and small plate, and boil them for twenty minutes; after which take the saucepan off the fire and allow the liquor to become cold; then take each piece out and polish with soft leather. A soft brush must be used to clean the embossed and engraved parts.—*S. Picsse.*

Mr. Geo. W. Childs, the energetic publisher of the *Philadelphia Ledger*, announces his intention to take a respite for a few months from the arduous duties of a publisher's life. Mr. Childs takes with him his family and sails for Europe this month. Mr. C. needs the rest, and with his merited reputation and genial qualities his arrival will be hailed with delight by many of our citizens sojourning abroad.

Velocipede Wanted.—We are having numerous inquiries for more information concerning the improved velocipede called for by the correspondent C. R. G., Paris, on page 212. In answer to all such we would state that we published all that was said on that subject in the letter. If any one wishes to see the original letter he can do so by calling at our office. We are not authorized to publish the writer's name.

In looking over our large list of exchanges we are gratified to notice that the Scientific American supplies them with a liberal amount of matter; and it is especially gratifying to us that the proper credit is usually given. It is our rule to credit all selected matter when it is possible for us to do so, therefore it is easy for our cotemporaries to judge what should and should not be credited to the Scientific American.

Iron in its various forms holds the third place in the list of American manufactured productions. Clothing, boots and shoes, leather and skins, severally, come very near to iron.

Sixteen kinds of fossil horses have been found in North America, yet there were no horses here when this country was discovered.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents

COMBINED SAWING, PLANING, TURNING, AND BORING WOOD MACHINE.—Thomas Smith, California, Mo.—This invention is designed particularly for use in the carriage shop, and consists of a combination of parts by which all the various operations of sawing, planing, turning, and boring the material of which the wheels and other parts of carriages are constructed, can be performed by a single machine, thereby saving great expense, economizing room, and operating more conveniently than when several machines are employed.

"MARYLAND REFRIGERATOR."—Samuel Child, Baltimore, Md.—This improved refrigerator is so constructed that the meltings of the ice are retained in a position where they can be used to absorb the gases, vapors, or odorous matters that are given off from the viands, while the ice-cold water, as it becomes charged with these offensive matters, is passed out of the refrigerator without allowing entrance to the external air, and without permitting any air currents to pass in contact with the ice, either over or under it.

REVOLVING HORSE HAY RAKE.—John W. Acker, Copenhagen, N. Y.—This invention has for its object to improve the construction of the ordinary revolving hay rake, so as to make it more convenient and effective in operation.

GATE FASTENING.—M. B. Markham, Grass Lake, Mich.—This invention has for its object to furnish an improved gate fastening, which shall be so constructed and arranged that when the gate is swung shut, it will fasten itself; and which shall at the same time be cheap, simple in construction, and reliable in operation, holding the gate securely fastened.

PAPER PAILS, ETC.—Augustus Jennings and Isaac Jennings, Fairfield, Conn.—This invention has for its object to improve the construction of paper pails and other vessels, so as to make them more durable and stronger in construction, and more reliable in use.

CORN PLANTER.—Wm. B. Goodwin, Effingham, Ill.—This invention relates to improvements in corn planters, the object of which is to provide markers to show the rows of corn in both directions, and a spreader for spreading the grains of corn as they drop into the ground, and it consists of the arrangement of mechanism for accomplishing the same.

CULTIVATOR.—J. C. Stroud, Lockhart, Texas.—This invention has for its object to improve the construction of cultivators, especially with reference to the attachment and operation of the plow beams, so as to make a more convenient and effective machine.

COMBINED ROLLER, HARROW, AND MARKER.—Jacob Ginther, Mier, Ill.—This invention has for its object to furnish an improved combined roller, harrow, and marker, which shall be so constructed and arranged that the three devices may all be used together, or the roller alone, or the harrow alone, or the roller and harrow without the marker, or the harrow and marker without the roller, as may be desired.

LUBRICATOR.—John Harlin, New York city.—The object of this invention is to provide a lubricator with an ordinary plug or cock, in such manner that it can never leak. It consists in the application of packing at the large end of the plug, whereby the escape of any fluid, either oil or steam, is completely prevented.

LATHE CHUCK.—John R. Washburn, West Stafford, Conn.—This invention relates to a new device for adjusting and operating the jaws of that class of chucks which are provided with gear and scroll wheels, and the invention consists in attaching the operating pinion to the key, so that it will form part of the key and not of the chuck, as usual. Thereby the necessity of providing bearings for the pinion is overcome and the application of the key to any side of the chuck is rendered possible, by providing a series of apertures for the insertion of the key, through the sides of the chuck.

REVERSIBLE CHAIR.—Wm. H. Joeckel, New York city.—The object of this invention is to so construct railroad car and other chairs, that when the back is swung over to reverse the front of the seat, the seat itself will also slightly swing, so as to be lowest nearest the back. The invention consists in the application of two arms, on each side of the chair, for transmitting the requisite motion from the back to the seat, but not *vice versa*.

TOY GUN.—Fisher A. Spofford and Matthew G. Raffington, Columbus, Ohio.—The object of this invention is to so construct a toy gun that it can be readily discharged, even when provided with a strong spring. The invention consists in the formation of a downward enlargement of the barrel, near the breech end of the same, into which enlargement the front part of the plunger is fitted when the piece is cocked; the trigger has then only to raise the plunger out of the enlargement and to bring it in line with the bore of the barrel, thereby exposing it to the full action of the spring.

HAY KNIFE.—Charles A. Fisher, Geneseo, Ill.—This invention relates to the construction of a knife for cutting hay, but relating more particularly to the handle thereof and the manner of its connection with the shank of the knife.

TUMBLER STAND.—J. C. Wharton, Nashville, Tenn.—The object of this invention is to provide a stand for tumblers or other drinking vessels of similar character, and is designed as an adjunct to soda water fountains, or as an article of furniture in places where beverages and fluids are retailed.

FINGER RING.—W. H. Peckham, New York city.—This invention relates to a new finger ring, which is provided with a groove on the inner side, so that with an outer side of ordinary or suitable shape the ring will appear to be solid and heavy, while it will, in fact, be a light shell. By this method beautiful rings can be cheaply produced, and not so much metal will be wasted in their manufacture.

FISHING WITH SET NETS.—Thomas Cartwright, Davenport, Iowa.—This invention relates to a new and improved application of a fyke or set net, with a boat or vessel, whereby the fyke or net may be set and raised with the greatest facility in a tide way, and in localities where nets of this kind has not been hitherto used.

SELF-ACTING DAMPER.—George Tamkin, Newburg, N. Y.—This invention consists in the employment of a composite metallic rod within the stove pipe, in connection with the usual circular damper, and so arranged that the damper will be adjusted automatically by the vibration of the rod which vibration is due to the unequal expansion or dilatation of the two parts composing the rod.

SPLINT FOR SURGICAL USES.—H. D. Ballard, Findlay, Ohio.—This invention consists of a splint made in two parts, which are so joined together as to be adjustable in a longitudinal direction, and provided with springs arranged to have a constant tendency to extend the parts. The ends of the splint are provided with buckles to which adhesive straps may be buckled for fastening it to the bandages of a limb.

ELASTIC ROOFING.—Thomas E. Wood, Knoxville, Pa.—The nature of this invention relates to improvements in roofing, and consists in the construction of roofs of the compound which forms an elastic covering which will not be effected by the weather.

AXLES FOR CARRIAGES.—W. D. Bollinger, Cedar Rapids, Iowa.—This invention relates to improvements in axles for carriages, and has for its object to provide an arrangement whereby the wheels may be connected rapidly to the axle, and yet be independent of each other. It consists in producing a compound axle, having one part arranged to work within the other.

APPARATUS FOR JOINTING CIRCULAR SAWS.—Isaac France, Peru, Ind.—This invention consists of an attachment to be applied to the mandrel of the saw at one end, the other projecting beyond the cutting points of the teeth, parallel with the side of the saw, and supporting a slide, whereon a file is secured in such a manner that it may be fed up against the teeth to dress those projecting down to the line of the shortest ones.

PUMPING ENGINE.—George W. Perry, Shenandoah city, Pa.—This invention relates to improvements in engines used for raising water from mines, and especially designed to be applied to what is known as the "Cornish pumping engine," whereby many of the objections to that engine are obviated.

SHEARING DEVICE.—William S. Lane, Beaver Dam, N. Y.—This invention relates to a device to aid in the operation of shearing sheep, whereby that difficult performance is greatly facilitated, and consists in providing an elevated trough in which to secure the sheep, so constructed and arranged that the position of the trough may be changed by the foot of the operator.

HORSE SHOE.—P. C. Johnson, and Edwin Froggott, Central city, Colorado Ter.—This invention relates to a new and improved mode of securing calks to horse shoes, whereby the former may be very readily applied to and detached from the latter, and a horse shoe always kept supplied with proper calks without the aid of a smith.

WHEEL FOR VEHICLE.—J. Blackburn Jones, Sparta, Ill.—This invention relates to a new and improved wheel for vehicles, and of that class which are made of iron and wood combined.

TANNING COMPOUND.—B. F. Gross, Trenton, Tenn.—This invention relates to an improvement in tanning leather, whereby the time usually consumed in the process is greatly lessened, and the expense of tanning otherwise reduced.

SPRING FOR WHEEL VEHICLES.—E. L. Gaylord, Terryville Conn.—This invention relates to a new and useful improvement in springs for wheel vehicles, and is designed to supersede what are generally known as "side springs."

STEAMBOAT PADDLE WHEELS.—James Granger, Zanesville, Ohio.—This invention consists in providing a traveling bridge for the chain to which the buckets are attached, which shall prevent the chain from sagging, and otherwise support and keep the wheel in place.

BALANCED SLIDE VALVE.—J. R. Hall, Salem, Ohio.—This invention consists in providing cylinders in the back of the valve, and fitting therein plungers, having recesses in the top opening to the face of steam chest having areas equal to the different parts of the valve exposed to an upward pressure, and openings to admit the line steam to them, and provided with packing joints to control the steam in passing to and from the said recesses.

MITER MACHINE.—James H. Estes, Boston, Mass.—The present invention relates to a tool or machine for the cutting of miters or angles in wood, which is so constructed as to be susceptible of adjustment for cutting or sawing the wood placed therein to any desired angle, with reference to its length or thickness, or both, at one and the same time; and in combination therewith, so constructed as to form a rest or bearing for a plane when used thereon, at and along with edges of the plane stock, beyond its cutter blade.

HARROW AND CULTIVATOR.—A. S. White, Malone, N. Y.—This invention relates to a new and improved drag or harrow which may also be used as a cultivator.

FOLDING CHAIR.—Claudius O. Collignon and Nicholas Collignon, Closter, N. J.—This invention relates to improvements in folding chairs, whereby they are made more durable and substantial than those heretofore known.

STUMP EXTRACTOR.—T. J. Booth, Jefferson Line, Pa.—The object of this invention is to provide a simple and powerful machine for extracting stumps.

DENTAL MODEL PLATE OR DIE.—Levi Stuck, Bryan, Ohio.—The object of this invention is to obtain a perfect dental model plate or die of metal, by casting the same in the plaster from the mouth impression.

DAVIT BLOCK AND HOOK.—N. M. Ray, Ellsworth, Me.—The object of this invention is to accomplish the unhooking of boat tackles without the necessity of a person getting into the boat, whereby the boat may be detached safely and expeditiously while the vessel is under headway, or when there is much sea on, without liability to fill or swamp.

ELEVATOR.—N. L. Milburn, St. Louis, Mo.—The object of this invention is to provide a simple and effective machine for elevating bricks and other building materials to the workmen on the scaffolding of buildings in course of erection. It consists, in general terms, of a pair of platforms attached to the ends of a chain or rope which passes over a drum or wide pulley mounted on a shaft at the top of a suitable frame work, together with other accessory mechanism.

AWNING.—Thomas G. Tyler, New York city.—The object of this invention is to provide an improved form of awning, which is portable, durable, and easily operated. It consists, in general terms, of a system of frames each of which is composed of a rectangular front slat or board affixed to two tapered side slats with points of the side slats of each frame pivoted to a common center. Each frame is successively smaller than the other so that they will pass one within the other, successively, when the apparatus is raised, thus bringing it in a small compass suitable for portability. It is provided with stay rods, halyards, and other devices perfecting the whole.

FOLDING CHAIR.—Adam Collignon, Closter, N. J.—This invention relates to chairs, which are made to fold up, for convenience in transportation and storage.

STEAM PUMPING ENGINE.—Robert Allison, Port Carbon, Pa.—The object of this invention is to overcome difficulties which have hitherto been experienced in the use of pumping engines for raising water from deep mines.

HORSE HAY FORK.—William D. Brooks, Bethany, Pa.—This invention relates to a new and improved device for elevating hay and grain, both for stacking and mowing the same in barns, which devices are commonly termed horse hay forks.

GUARD FOR CARPET-SWEEPING MACHINES.—Gilbert F. Taylor, New York city.—This invention consists in the application of a pad to the sweeping case, the pad being constructed and arranged in such a manner that it will effectually prevent the abrasion of furniture, and admit of being readily applied to and detached from the case.

STEAM BOILER.—Marshall Turley, Council Bluffs, Iowa.—This invention relates to improvements in boilers for generating steam, whereby the greatest amount of steam generating or fire surface is obtained, and danger from bursting or overpressure is avoided.

LOCK.—Christopher Read, Jersey City, N. J.—This invention relates to new and important improvements in door locks, and locks for other purposes, whereby they are made burglar-proof, and it consists in an arrangement of tumblers, slides, and cams, whereby the keyhole is closed by the operation of locking the door, thereby rendering it impossible to insert any other key or a burglar's tool for picking the lock.

VARIABLE CUT-OFF STEAM-VALVE GEAR.—George J. Roberts, Dayton, Ohio.—This invention consists in so operating the induction valves of a steam engine that the quantity of steam admitted into the cylinder shall depend upon the speed, and be made variable according to the power required.

COFFIN PRESERVER.—J. J. Reichert, Delaware, Ohio.—This invention consists in so forming a case for the reception of dead bodies, before burial, that they may be preserved from decay for a reasonable length of time (a number of days), by lowering the temperature by the use of ice and in producing a circulation of air through the case.

STEAM GENERATOR.—Victor Langlois, Cherbourg Dock yard, France.—This invention relates to improvements in the construction of multi-tubular boilers and in tools for securing the tubes, also, a method of preventing incrustation.

MAGNETIC PRINTING TELEGRAPH.—Pierre Antonie Joseph Dujardin, Lille, France.—This invention relates to improvements in telegraphs for printing either letters or figures, at will and embodies two systems one of which is a modification of the other. In the first system, the type wheels fixed crosswise over one another rock on their common axes and are placed first one and the other opposite the paper strip, which always keeps the same direction. While in the second system the type wheels are parallel and stationary on their axis, the printing anvil alone being rocked and presenting the paper first opposite one type wheel, and the other.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

J. C., of N. Y.—The "rich orange hue" to light brass work is produced by cleansing with acids, and the use of a lacquer, many recipes for which may be found in previous numbers of the SCIENTIFIC AMERICAN.

F. P. S., of Ind., asks for the composition of the fulminate for needle guns. We think fulminating mercury is the principal ingredient. What other substances are used, except a paste for coherency, we cannot say. Perhaps some of our readers possess the secret.

H. J. E., of N. Y.—"Can you give me any information in regard to the best style of rollers for moving buildings?" Rollers of seasoned hard wood, oak, elm, or rock maple, from eight to twelve inches diameter and from four to six feet long.

W. P. B., of Wis.—"A. R. B., a machinist, claims that a boiler 8 feet diameter will carry the same pressure per square inch as one 4 ft. diameter of the same thickness of iron, other things being equal. I, a tanner, claim the contrary. Please decide." The common lap welded tubes used in steam boilers, of less than one eighth thickness of iron, will withstand a pressure of 600 lbs. to the square inch. Will a cylinder of the same thickness, but 6 feet diameter, bear this pressure? Any text book will teach A. R. B. his error.

H. P., of Ohio.—"What is the best way of hanging a shop grindstone running in water all the time, or rather all the working hours? I have trued the stone by clamps—four bars with set screws at each end—on a square shaft, and also by 'shims' or wedges driven between the stone and shaft, and in both these ways have split the stone." In our experience we have met with the same mishap in using the set screw clamps. Our plan is to hang the stone on a square shaft and use split shingles (dry) as wedges for truing the stone, and when true cut them off up to the edge of the stone, and then slip on flanges of cast iron with disks of leather between their faces and the stone. The surfaces of the leather disks should be coated with white lead and oil, very thick on the side toward the stone to fill up the interstices of its rough surface, and then the flanges screwed up snug by nuts on the shaft, which should be threaded for this purpose. This will prevent water from reaching the cedar wedges and swelling them, and the stone will remain in place on its shaft until used up.

J. P. J., of Mass., asks why all engine cylinders are not bored horizontally. He thinks it strange that some are bored upright. Cylinders of any large size should be bored in the position they are destined to occupy, because the weight of a cylinder when resting horizontally will tend to compress the top side and render the bore elliptical instead of circular. Small sized cylinders, 30, 34, or a less number of inches diameter, which have relatively thicker shells than larger ones, may be bored without reference to their use as horizontal or vertical engines. A cylinder 6 feet diameter, 1½ thick, will show a difference in diameter of 1½ inches when laid horizontally.

P. J. P. of R. I.—My "boss" objects to filing my lathe centers to finish them to a point. How can I otherwise do it?" Your case is like many others of those who have never learned hand tooling, a branch altogether too much neglected. Your boss is right. Practice hand tooling and with water you can finish even the point of the center without having recourse to a file. The use of a file for that purpose is evidence of a "botchy" workman.

S. M. D., of N. Y.—A recipe capable of doing all that you desire, would be much more valuable than the amount you propose to give for it.

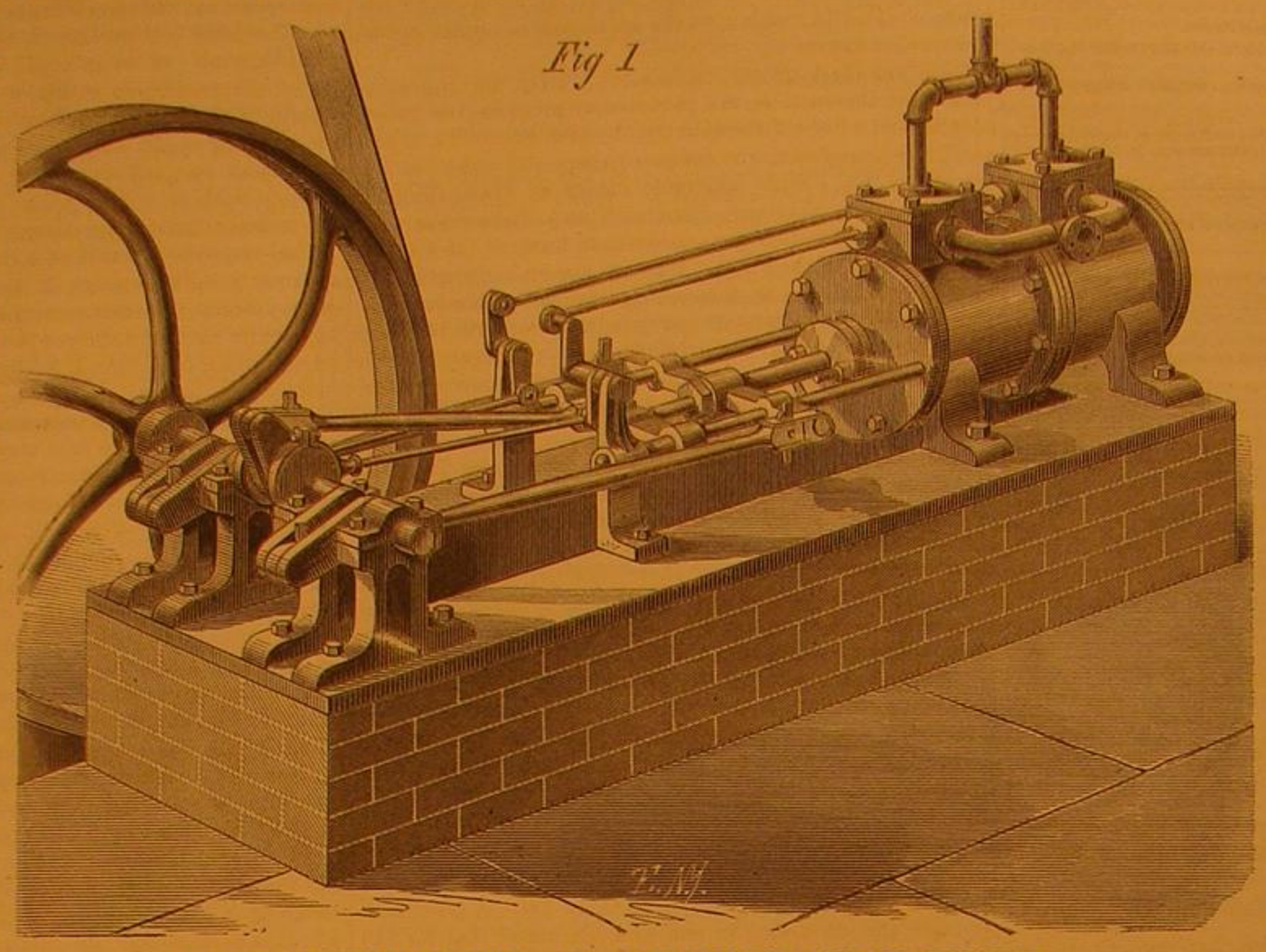
Business and Personal.

The charge for insertion under this head is one dollar a line.

Improvement in Double Cylinder Engines.

Fig. 1 represents the above engine in a perspective view, and Fig. 2 a longitudinal vertical section of the cylinders of a working model. The object of the invention is "to produce a double-acting cylinder which will do the work of two separate cylinders, without being much more expensive than one single cylinder." The machine has a cylinder divided by a transverse partition, A, Fig. 2, into two cylinders of equal diameter and length. Preferably this combined cylinder is cast in two parts, bolted together and bored, when the gland or partition, A, is introduced and the whole secured, as seen in Fig. 1. Each cylinder has its own piston, that in B having a rod working through a guide and stuffing box on the partition, A, and through the hollow piston rod of the cylinder, C. This hollow rod may be cored out through the greater part of its length, if desired, leaving bearing surfaces at each end. The crosshead to which the tubular piston is attached is furnished with a bearing box to receive and guide the rod of the piston in the cylinder, B. The crossheads of the piston rods run on slide bars connected at one end with the front cylinder head, and at the other with uprights secured to the bed, which also support the rock shafts connecting the eccentrics and valves. Both the piston crossheads are connected by bars to cranks on two shafts in line with each other, made one by the central crank, which with the outside cranks stand at the position of ninety degrees, so that while one crank is in the position known as the dead center the others are at right angles to the line of motion of the piston, thus neutralizing the dead center point and obviating the necessity of a fly wheel. This relative position of the pistons is seen plainly in Fig. 2.

Fig. 1



FISK'S DOUBLE PISTON AND CYLINDER STEAM ENGINE.

Each cylinder has its own steam chest and independent pipe from the boiler, so that steam of the same pressure and temperature is used in one cylinder as in the other. The action of the valve rods, by eccentrics, as usual, and the general construction of the engine are perfectly apparent from the engravings, as is also the design of the inventor. He claims that in "this engine there is double power compared with a single piston engine of the same length of stroke and diameter of cylinder, inasmuch as the steam has full power upon two pistons instead of one, and the greater length of stroke in the single piston engine is compensated for by the advantage of placing the cranks at right angles, one crank overcoming the dead point of the other. There is also a great gain in weight and space as compared with the single piston engine, as the weight of the cumbrous fly wheel and its attachments may be dispensed with."

Further information may be obtained by addressing the inventor, E. A. Fisk, New Orleans, La.

Patent pending through the Scientific American Patent Agency.

Carbonic Acid of the Atmosphere.

The atmosphere contains a small proportion of carbonic acid gas. This quantity is variable, differing from three to nearly seven parts in 10,000. Assuming then, the mean of these—namely, that there are five parts of that gas in 10,000 of air, it will be interesting to show the weight of it, and perhaps even more so of that of the carbon contained therein, thus so singularly distributed about us. It is found that one cubic yard of carbonic acid gas weighs 3 lb. 5 oz. 8 dr.; consequently, one cubic mile weighs more than 8,139,011 tuns; since there are about 977 cubic miles of this gas in the whole atmosphere, its total weight slightly exceeds 7,454,285,092 tuns. The quantity of actual carbon is of course less, because carbonic acid gas consists of carbon nearly 27½, and oxygen 72½ in every 100 parts; or, in other words, a cubic yard of carbonic acid gas contains by weight about 14½ oz. of carbon and 2 lb. 6¾ oz. of oxygen. A cubic mile of it contains rather more than 3,898,292 tuns of this element. The 977 cubic miles in our atmosphere contains the stupendous amount of 2,155,834,277 tuns. If it were possible to render this carbon available as a fuel, using it at the rate we use our coal (105,000,000 tuns annually), it would last for a period of more than twenty years.—*C. H. Piesse.*

An Achievement in Dentistry.

The editor of the *Bainbridge Argus* gives an interesting account of restoration of speech by means of an artificial palate, made for him by Professor Kingsley of New York College of Dentistry. He says:

"All persons acquainted with us are aware of the loss of speech which we sustained in early life by the destruction of our palate, caused by scrofula. This almost totally disqualified us for any business, calling us beyond the circle of our immediate friends and associates. A stranger could rarely understand a word we might say. We thank God that we are enabled to state to our friends that by means of an artificial palate, put in our mouth by Dr. Kingsley, our speech has been entirely restored, and we are now, for the first time during the last twenty-eight years, qualified to converse freely with any one without the slightest inconvenience or embarrassment, and without being misapprehended or misunderstood in any word or sentence we may utter. It has proven a very great relief to us, so much so that our past life seems to have been an uninterrupted blank."

A Gigantic Balloon.—A New Aeronautical Experiment in England.

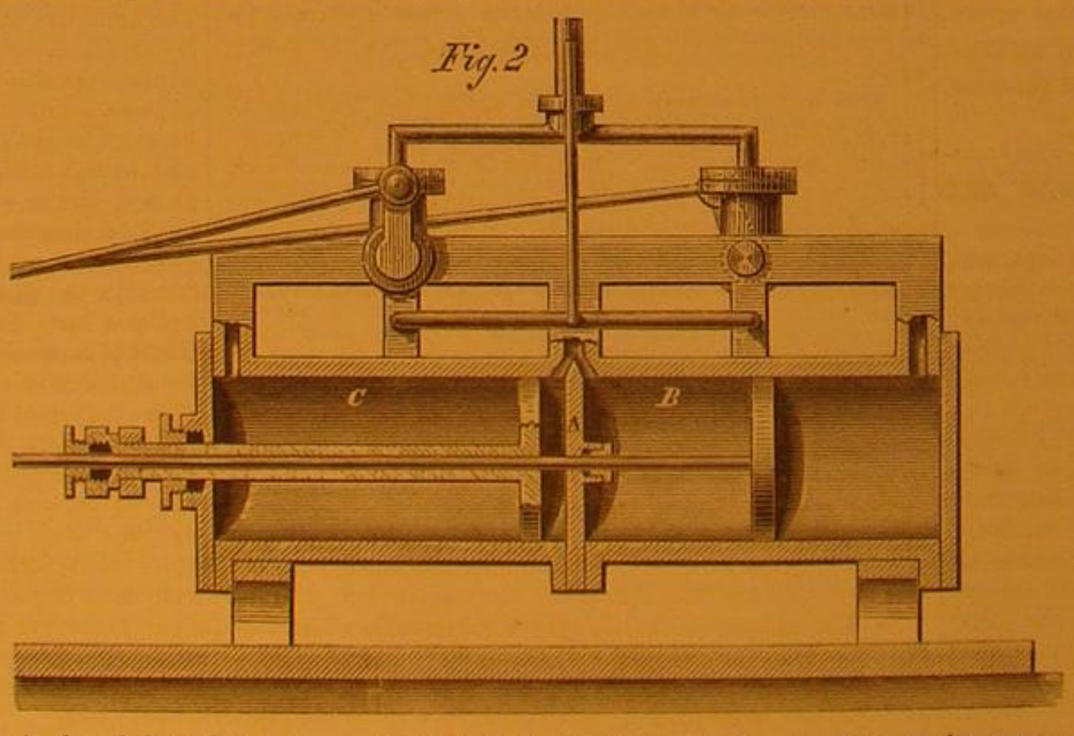
A London paper says: "Over the Ashburnham grounds, immediately to the west of Cremorne Gardens, now floats a balloon of unparalleled dimensions, and which, from the peculiarity of its accompanying machinery, seems likely to acquire a remarkable place in the history of aeronautical science. It is nearly spherical in shape; it is ninety feet in diameter; it is capable of receiving 353,000 cubic feet of gas; and it has a lifting power of eleven tuns. Its magnitude will perhaps be brought more distinctly home to the imaginations of our readers by the statement that the receptive capacity of the balloon in which Mr. Glaisher made his important experiments, and which was, we believe, the largest one hitherto constructed in England, held only 93,000 cubic feet of gas, or about one-fourth of the quantity for which the new aerial monster can afford space. But the use to which this immense power may be applied is perhaps more remarkable and more likely to lead to valuable as well as interesting results than the power itself. Balloons, from their erratic and unmanageable propensities, have hitherto been little better than huge and costly toys. The 'Captive' balloon is placed, in one important respect, under human control, through its connection with the solid earth by means of a cable, just as a boy's kite is held by a string; and to this circumstance, as will be easily understood, it owes its name. This cable is worked by steam from a drum twenty-one feet long and seven feet in diameter, and passes underground to the balloon. Its weight is two and a half tuns, and its length two thousand feet.

"The weight of the balloon, with its car, ropes, and netting, is three and a half tuns, and this, with the cable, gives a total dead weight of six tuns, so that the available carrying power is five tuns, which is about two tuns more than would usually be required to lift thirty persons, the number the car is constructed to accommodate. The gas which is to inflate the vast machine, and which is pure hydrogen, requires for its manufacture some two hundred thousand pounds of sulphuric acid and one hundred and ten thousand pounds of iron filings have to be consumed. So costly and so delicate a work necessarily required some external protection, and an immense circular screen, formed of boards and canvas, shuts out the public from the space within which the balloon rests. The balloon, with its machinery, is French property, and has been entirely devised, and is almost exclusively worked, by Frenchmen. It offers a proof, too, of the enterprise as well as of the skill of our brilliant and ingenious neighbors. It has, we have been informed, involved from first to last an outlay of £28,000; and it is now proposed that some return should be obtained for this investment by charging one shilling to each visitor within the inclosure, and one pound to the aeronauts who ascend in the apparently safe and commodious car.

"Some experimental trips were made with the balloon on Thursday afternoon. In the first of these the ascent took place with mere ballast; in the second Mr. Godard, son of the celebrated French aeronaut, and M. Yon, who seems to have a large share in the management of the whole undertaking, were the only occupants in the car; in the third thirty persons, including two French ladies and a boy, filled the ascending vehicle, and after having attained in it to an elevation of nearly two thousand feet—the total length of the cable—returned from their aerial voyage with perfect ease and safety, and evidently much gratified with the novel and striking glimpse of London and its environs which, in spite of the warm haze obscuring the atmosphere, they were thus enabled to obtain. Those private or experimental trips were to have been renewed yesterday, and the show was to have been thrown open to the public to-day; but it was found that a rather considerable escape of gas had taken place; and in the attempt yesterday afternoon to remedy this defect an accident took place which may not improbably have the effect of delaying the intended exhibition for several days.

"A gasometer was constructed for the purpose of storing a supply of hydrogen to meet the inevitable waste which will be constantly occurring. A pit or well had, of course, to be dug under this gasometer; and in order to pump the water into the pit one of Merryweather's steam engines was being employed in immediate proximity to the spot on which were standing two rows of barrels in which the gas is generated. The engine was not engaged many minutes in this operation when the sparks from its chimney slightly set fire to some bags filled with iron; it was then stopped for a few moments; but its working having, in spite of the warning thus afforded, been soon renewed, the sparks were next carried to the retorts, causing sixteen of them to explode in rapid succession, and creating a scene of considerable excitement among the whole party filling the grounds. The barrel-heads and the zinc pipes by which they were connected with the gasometer were instantly blown away, and many of the fragments were driven over the lofty screen surrounding the balloon. One of the workmen was struck by a piece of this wood, and was slightly cut in the face, but no other damage, fortunately, was inflicted, and the accident might, certainly, under more unfavorable circumstances, have been attended with far more distressing consequences. As it was, it may render it impossible to recommence the ascent for a few days, but it cannot interfere with the ultimate success of the undertaking in which the constructors of this great balloon have engaged."

Fig. 2



French Gas Stoves.

A correspondent calls our attention to an invention recently imported from France. It is a gas stove so constructed that when the gas is lighted, the cheerful appearance of a grate full of live coals, or of burning wood, is presented. We saw this stove on our recent visit to Europe, and it is a very pretty device. We believe, however, that the use of gas for heating purposes, unless special provision is made for the escape of the gases of combustion is injurious to health, except in apartments very thoroughly ventilated.

During the recent earthquake in Peru not the least horrible detail was the resurrection of 500 mummies.

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VOL. XIX., No. 16...[NEW SERIES]....*Twenty-third Year.*

NEW YORK, WEDNESDAY, OCTOBER 14, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

NEW AND IMPORTANT PATENT OFFICE RULE.

Commissioner Foote, in his firm purpose to break up certain practices in vogue in the Patent Office, has promulgated a very stringent and important rule, which ought to be understood by all inventors who intend to apply for Letters Patent.

It has hitherto been the custom of the Office to permit applicants, or their attorneys, to withdraw papers either before or after a rejection, for the purpose of making amendments. Hereafter this practice will not be allowed. Papers once filed must remain in the Office, and are not to be inspected for any purpose whatsoever, either by the applicant or his attorney.

The rigid enforcement of this rule renders it doubly important that specifications and drawings should be carefully prepared, in the first instance, by experienced and competent attorneys, and not by those who have little or no knowledge of the rules and practices of the Patent Office.

We admit that the new rule will operate somewhat severely upon such inventors as do not feel able to employ an attorney, yet we doubt not Commissioner Foote has had good reasons for promulgating the rule.

OUR 'GREASY MECHANICS"—WHO AND WHAT ARE THEY?

It is quite fashionable to talk from the lecturer's desk, and to write from the editor's table platitudes about the "dignity of labor," but in spite of these, perhaps well meant endeavors, the occupation of the mechanic, if not himself personally, is not yet popular. As laziness and aversion to merely utilitarian work appears to be innate (*vide* the savages in uncivilized countries and their countertypes at home), it would be too much to expect that labor, either in itself, or for its benefit to the community, would be sought after, especially when the labor comprehended dirt—soiled hands, and faces, and clothes, and general unpresentability—notwithstanding the fact that greasy mechanics can make as good an appearance, when washed and dressed, in the church, the social party, and the ball-room as those whose have never been soiled with

"The honorable grime of labor."

It may be unpleasant to grasp the soiled hand of the mechanic at work, but water is plenty and soap is cheap, and the trouble of washing is amply paid by the consciousness of having shaken hands with one whose occupation is an honor, and its result a public benefit. For ourself, we always felt a personal pride in our standing among practical mechanics, and now feel a sort of masonic union with our former *confreres*.

Dirt is unpleasant to persons of even ordinary sensibilities. If "cleanliness is next to godliness," it is a virtue more generally admitted and practiced, at least outwardly, than others of a more saving character. This is well; but there *is* dirt that brings no dishonor on the wearer, the necessary dirt of labor. Of this no workman need be ashamed; it is not the badge of servitude, but the proof of independence. The filth of vice, the soil of idleness is disgusting, offensive to the beholder, and disgraceful to the wearer. It should be shunned as the pestilence.

Why mechanical employments, or rather the work of the mechanic should be considered, in any degree, low or degrading, it is hard to conceive. The antipathy has neither reason, fact, nor the exercise of taste to sustain it. Many other employments are as laborious, as purely mechanical, as monotonous, and some as soiling and indurating to the hands as that of the mechanic, yet they do not share in the disgrace some try to attach to the work of a mechanical trade. There is a proud gratification to the properly constituted mind in producing, by the exercise of the judgment and the acquired skill of the hands, some thing of use and beauty from inert and shapeless matter. Every mechanic has felt it as he has looked upon the product of his labor, the addition he has made, or aided in making, to the appliances of human needs, comforts, or desires.

Who are these greasy mechanics? They are the path-makers of the nations, the pioneers of progress, the brain, muscle, and nerve of the country, the men who build up and sustain communities, who conquer nature and make her the servant of art. Such honorable names as Watt, Bramah, Fulton, Evans, Whitney, Blanchard, and Stephenson shed greater luster on their generation than those of the soldiers and politicians of their day. Who are among the most prominent and useful men in the country at present? Mechanics—practical workmen, who, if not now day workers, yet have previously served their novitiate at a trade and wrought with their hands. To mention but a few of those in our principal cities and towns who occupy enviable positions, but who are practical and greasy mechanics: in Philadelphia, we have Sellers, Jenks; in Providence, Corliss, Brown; in Taunton, Mason; in Worcester, Washburn; in Boston, Adams; in Hartford, Woodruff, Pratt, Whitney, Stannard; in New York, Hoe, Copeland, Smith, Bacon, and others, all practical mechanics, shedding honor on their vocation and ennobling labor. To this brief list might be added hundreds of living exemplifications of the honorable character of the mechanic's work, without mentioning a single name of those whose inventions, apart from their mechanical skill, have made their fame and fortune.

Can a business that is the chosen employment of such men as these be degrading or disgraceful? Can any other show a better array of talent, character, standing, or number in its ranks nobler men? We think not; and yet parents, even fathers who are themselves mechanics, hesitate about apprenticing their sons to a business than which there is none more honorable. Some exceptions there are. A prominent engineer, the other day, in conversation, stated that he had accumulated enough to set up his sons in business, and enable them to start from a higher point than he did, "yet," said he, "I am giving them the advantages of a practical knowledge of the machinist's trade, to which I hope they will stick, as I have, through life."

The late Col. Colt was himself a practical mechanic. By his will he left to his nephew an immense fortune. At the time of Col. Colt's death that nephew was learning his trade of machinist in his uncle's shop, working diligently, in his dirty overalls, day by day, subject to the same rules as other apprentices. On his uncle's death he became a millionaire; but, choosing a guardian to manage his property, he continued at his labor, and faithfully served his apprenticeship. Now, as he walks the rooms of his fine house, or drives his handsome team, he has the consciousness that if his riches "take to themselves wings and fly away," he is furnished with the means of getting an honest livelihood, and may make a fortune for himself. He *was* a greasy mechanic, and is not ashamed of it; and not afraid to "face the music" again.

Labor and its accompanying dirt are neither dishonorable nor degrading; laziness and its almost necessary vices are disgusting and destroying. Dirty hands and a sense of independence are to be preferred to kid gloves and a consciousness of being a mere drone in the human hive.

STRENGTH IN BUILDINGS AND ITS APPEARANCE.

The solidity, in appearance, of buildings, which seems to have been the governing idea of the ancient Egyptians, as shown in the architectural remains in that crude land of civilization, has few copies in this country; the most noticeable instance we know is the Tombs, of New York city. Although we would deprecate the construction of public or private buildings on an Egyptian model, where appearance of solidity gives satisfaction to the eye, and the appearance and fact may combine, and prefer, for our climate, with its clear skies and genial sun, an open, inviting style of architecture, we think that while the consideration of proportions of strength in the parts and materials of buildings may properly be, and sometimes is entertained, the eye is not gratified by the general style of our present city structures.

Naturally a building should appear to grow out of the solid ground, or be a part of that which we, fortunate dwellers in a region uncursed by earthquakes, consider solid; and a stone, brick, or iron structure elevated on poles, whether of wood or iron, does not accord with taste, nor seem to meet the "eternal fitness of things."

We have made the relative strength of materials, their resistance to strain longitudinally, transversely, and directly as a support, our study more or less for years, as it has been our business to write upon these subjects; but we share the natural antipathy of taste and the natural instinct of danger when we pass buildings whose lower stories consist merely of a few pipe stems of iron sustaining tons of stone or brick above them. It is not enough to say that these iron stems (they can hardly be called columns) *do* sustain the load imposed upon them; for the painful idea is impressed upon us, as we walk the streets, that it would be as well to copy the example of the priest and Levite, and "pass by on the other side." We know, and every sensible person knows, that if a slight sinking of the substructure should occur, even if only an inch or two, the whole immense superstructure would come tumbling down; and no foundation is so secure that pipe stem stays can provide against such a possible accident. That the heaviest foundation may be moved by what might be, at first sight, considered slight and inadequate means was shown a few years ago in a neighboring city, where a building of large proportions was erected. The foundations of the walls were sunk deeply below the surface of the street, and the walls made of unusually heavy stone. The soil was a tenacious clay, and the owner of the property thought to compact the loose soil or clay on the outside of the walls by a plentiful supply of water from a hose. The result was a moving of the foundation stones, notwithstanding the immense weight of the superincumbent walls, to such an extent that the building would have been a wreck, but for the style of roof, which was self-supporting and trussed, and thus held the side walls in place. Cross walls of heavy stone in the sub-basement proved necessary to prevent a catastrophe.

That requisite strength of a building can be secured with apparently light supports in the lower story, we will not deny. Slight iron columns will support an immense load, apparently entirely disproportioned to their diameter; but to go no further back than the Pemberton Mill affair in Lawrence, Mass., in 1860, we have not unfrequent accounts of the destruction of buildings because of insufficient support to the walls. But let this be as it may, it is distasteful to the eye and productive of a natural fear to prop up three or four stories of heavy stone or brick by a few slight stems of iron, or suspend them by a cast iron arch above the heads of passers-by. Two columns of ten or twelve inches diameter, having the appearance as well as the fact of solidity, would not detract much from the light of a store front, and they would give a satisfaction to the eye, and a sense of security to the mind, that the columnar pipe stems, or the suspended arches so much in vogue fail to impart. Something is due to the innate and instinctive tastes of human nature, and not everything to the hazardous experimentings of the engineer or builder. The spider's web, although one of the strongest structures in existence when amount of material and actual service are considered, does not have an appearance of strength, and travelers over the Niagara suspension bridge feel they have performed a feat they would not plume themselves upon if crossing a substantial stone structure, or such a bridge as that over the Menai Straits. In building, as in other matters, appearance as well as safety is an element worthy of consideration by our builders.

TACT—WHAT IS IT?

What is tact? What is this peculiar qualification which one possesses and another does not? which enables one to avoid disagreeable issues that others apparently quite as keen sighted, quite as well informed, quite as experienced are unable to shun?

All concede it to be an element of success. We often hear it said in commendation of some eminent man, that "he is a man of great tact," that "he has the tact to manage men," that he has "a superior tact for business," and so forth. If necessary to success in life, how can it be obtained? Before the latter question can be answered intelligently, we must know what it is we seek.

The primary meaning of the word tact is touch—feeling. The figurative meaning which has been attached to the word is difficult to accurately define. It has been defined as perception, peculiar skill, or faculty, discernment; but neither of these definitions is complete or satisfactory. Thus, when we say "he had sufficient tact to withdraw," we do not mean that he had skill, or discernment, or perception, sufficient to prompt him to withdraw; there is some thing more subtle involved than these definitions express. There is nothing so good as the primary meaning of the word, touch—feeling. Conceive the mind to be able to touch, to feel other minds, and you have got it exactly. The mind has many subtle modes of expression. An elevated eyebrow, a puzzled look, a a modulation in the voice, an impatient gesture, or a quiver of the lip, reveal hidden feelings, oftentimes against the will. Tact enables its possessor to immediately recognize these indications, and to shape his conduct accordingly.

In its highest perfection it is a rare quality. There are men who have sufficient force of character to thrust themselves into prominence without it, but they are few, and generally more feared than loved. If placed in situations of command, discontent and demoralization are almost certain to arise among those who submit to their rule, marked, as it is sure to be, by total disregard of the finer feelings of their subordinates.

The want of tact is the chief characteristic of the numerous family of bores; the men who call upon you to chat when your business is most pressing; who come into your shop and misplace your tools, who interrupt you when you are holding a confidential conversation; look over your shoulder when you chance to be writing; enter your private apartments without knocking; are always just where they are not wanted, and doing that which is disagreeable. These people are not, generally, intentionally offensive. They mostly mean well enough, but they are mental pachydermata, who can feel nothing but blows. A hint is thrown away upon them, and the only alternative, in dealing with them, is the kick.

Tact is born of sensibility—it is sensibility. To some it seems a natural gift, but it can be cultivated by all. The habit of observing carefully the countenances, the manners, and the language of men, the study of character, and a general acquaintance with human nature, will soon impart a knowledge of the secret springs of emotion, which, if touched at all, must be touched with wise and delicate skill.

THE SUGAR BUSINESS IN CUBA.

From a correspondent in Havana, Cuba, E. K Dod, we have received a long communication relating his experiences on sugar estates on the "ever faithful Isle," and asking for improvements in the business of harvesting the cane crop, which he thinks may be made by Yankee ingenuity. He says, in brief: "Our situation here is critical indeed. I see no chance of improvement in our sugar interests. Our planters seem determined to twist the ropes for their own necks, for the only cry is for more hands. It seems impossible for them to see that more hands is the cause of their present lamentable condition. The rapid increase of the beet sugar interest in France and other parts of Europe, together with our own crops, has so much exceeded in supply the demand that prices have fallen really below the absolute cost of production in this island and most of the others. It is well known that in France the cost of manufacture has been reduced in a greater ratio than the fall in price, and the business is profitable, while here the cost of production and manufacture is now more than it was in 1830, as negroes have nearly tripled in value. I do not think there is an estate on the island that pays current expenses. The amount of depreciation of lands, buildings, etc., leaves but about $150 per year for each negro; a sum not sufficient to cover the interest on their cost, deaths, and yearly depreciation, and yet the cry is, more hands."

The writer then goes on to describe the method of working sugar estates in Cuba, and shows that the use of a large number of hands and an adherence to old styles of work, are working a rapid deterioration in the value of lands and a diminution in the amount of products. The gist of his communication is that there is an opening and a necessity for the introduction of Yankee invention, brain, and personal supervision, to make Cuba what she ought to be—the garden of the Antilles and the great sugar producer of the world. He believes, also, that the beet root culture and the sugar manufacture from this source in the States, aided by the inventive talent of our mechanics, would soon render us independent of our Cuban supply.

PRESERVATION OF WOOD--PREVENTION OF DECAY.

On page 213, current volume, Scientific American, we copied the claim and description of Mr. Theodore W. Heinemann's patented process for preserving wood, applicable to all uses to which wood is applied, whether to be submitted to the action of the elements, as in ship building, houses, railroad ties and sleepers, fence posts, etc., or for indoor work, furniture, ornaments, and similar purposes. We are convinced that his method is really valuable and practicable. He expels the moisture—the prolific source of decay—destroys, or entirely changes the character of the nitrogenous or albuminous principles, and charges the pores of the wood with resin to such an extent as to render it really indestructible. It is well known that the preservation of Egyptian mummies for 3,000 or 4,000 years is due to the resinous quality of the gums and drugs used in embalming and that our most durable timber is that which contains this substance in the largest quantity and greatest purity.

Mr Heinemann's process also greatly improves the appearance of the woods submitted to it when used for ornamentation, darkening their tints, bringing out the peculiarities of structure, and making them susceptible of a high polish. Specimens may be examined at the office of the American Wood Preserving Company, 42 Broadway, New York city. See advertisement.

Organisms at the Bottom of the Atlantic.

Professor Huxley read a paper on some organisms which live at the bottom of the North Atlantic, in depths of 6,000ft. to 15,000ft. He said he had no doubt they were all acquainted with the subject of the Atlantic cable, which lay over 1,700 miles of sea bottom extending from the west coast of Ireland to Newfoundland. In 1857 a plan for laying that cable was first taking a thoroughly practical shape. Our Government had at that time been moved by representations made to them to have the sea bottom throughout that extent carefully examined, for the purpose of finding out whether there were any impediments to the safe lodgment of the cable at the bottom of the sea. Very various opinions were held on the subject, and many persons maintained that there were great rocks which would catch or cut the cable. The Admiralty despatched the "Bulldog" steam vessel, under the command of Captain Dayman, who was supplied with an ingenious apparatus, by means of which larger or smaller portions of the sea bottom could be brought bodily up from any depth at which soundings could be made. Captain Dayman made his soundings, and brought back his specimens of the sea bottom, and the Admiralty sent the whole of the soundings to him (Professor Huxley) for examination. They were extremely interesting, as they for the first time supplied the means of ascertaining what was the precise nature of the mud which covered the bottom of the sea. He should only speak of the soundings brought from a depth of from 1,000 to 2,400 or 2,500 fathoms or from 6,000ft. to 15,000ft. The depth of the Atlantic was such, that in the deepest part of it, if Mont Blanc was sunk, the top would be covered, and he had specimens of the bottom from that depth. It became his business to report on these soundings, and report of their nature; and he stated in his report that the deposits consisted of minute round bodies, to all appearance consisting of several concretic layers, surrounding a clear center. As these bodies were rapidly dissolved by dilute acids he thought at that time that they could not be organic. That, however, he found, on more minute and careful investigation, to be an imperfect statement of the facts of the case. The largest of them was the 16-100th of an inch in diameter, and he had not examined them at first with a sufficient power.

Three or four years afterward, Dr. Warwick printed his "Notes on the Existence of Organic Bodies at Great Depths in the Sea." He discovered what he called cocospheres, which he thought looked extremely like as if they were made up of a number of what he (Professor Huxley) had called cocolites, set side by side in a kind of mosaic. In 1861, Dr. Warwick published another paper, in which he stated that the cocolites were identical with minute bodies which had been discovered in chalk by Mr. Swaby, who was the first person to point out this interesting circumstance. In the same year Mr. Swaby got a step further, and found that these bodies—which he (Professor Huxley) had called cocolites, from their being concretionary, if they were turned round, no easy matter with so minute an object—were concave—such things as might be cut out of a hollow sphere of glass; that they were, in fact, like thick watch glasses; and he showed that they could not be concretious—that is, that they could not be of animal nature. He (Professor Huxley) re-examined the specimens of the deep sea soundings, by applying to them a much higher magnifying power than he had used before. He might mention that all persons who had been concerned in bringing up Atlantic mud spoke of it as being a wonderfully tenacious and sticky substance. He found it to contain an immense number of minute shells, and of an enormous number of little, irregular pellets of jelley, dotted all over. It was to the dotted pellets that he desired to draw attention. On applying a power of 1,200 diameters, they could be analyzed and resolved pretty well. In each of the pellets would be found a great number of granules scattered about, each being the 40.000th to the 20,000th of an inch. These he found were all organic particles, yielding, as they did, to all the changes to which organic bodies yielded when the proper materials were applied to them. The average diameter of each heap of granules was the 12-100th of an inch, and each represented a mass actually living at the depth of the sea, and developed in its slime. So that, intermixed amongst the shell, there was an immense body of jelley, which contained the bodies of the simplest kinds of organisms, each representing a kind of spicula of primitive organism. The fact that those bodies exhisted at the depths he had stated was beyond dispute, so that the depths of the sea contained those living organisms from which old philosophers held that all things proceeded. And some persons were coming round to that opinion again. For his part he expressed no opinion as to whether they were plants or animals. They were, perhaps, the simplest representatives of that ground between plants and animals, as to which so much was said in the present day.—*London Mechanics' Magazine.*

A Novel Gun.

The progress of the proceedings at this year's meeting of the British Association has been unusually diversified. Papers have been read on nearly every subject that can interest and instruct mankind. At one time Professor Huxley has discussed the nature of the organisms found at the bottom of the Atlantic; at another Miss Becker has defended women from the charge of being intellectually inferior to men; Captain Galton has shown how to construct a stove which shall warm and ventilate a room at one and the same time; while, to add another to the incongruous list, Mr. Charlesworth has now described a new gun, whereby men may shoot with great comfort, and animals be slaughtered with great certainty. This gun appears at first sight to be constructed on a mistaken plan. It is to be held in the outstretched hand, in place of being fired from the shoulder. Professedly it is an improvement on the old walking-stick gun. The latter resembled an elongated pistol. Like the pistol, it could not be held steadily enough so as to ensure precision in the practice. The improvement consists in employing what is styled an elevator—that is, a sort of straight handle projecting from the under side of the barrel close to the breech, and grasped by the one hand, while the handle at the end is held by the other. As is the rule in the case of new inventions or the modification of old arrangements, great advantages are claimed for this alteration. As a fowling-piece or rifle the new gun is said to excel. It is obvious that if this be substantiated, then the customary form of stock and barrel must be abandoned in favor of the hand-gun. In one respect the new gun is a retrogression, for the method of firing it is almost identical with that of discharging an arrow from a bow. This may be the right way after all, but we should like to have additional testimony in favor of the change before approving of it. What with rifling muskets and then transforming muzzle loading rifles into breech-loaders, there have been incessant alterations in fire-arms for some years back. Although the army must be furnished with the most efficient weapon, the public will yet feel dissatisfied should it be found that the soldiers' rifles must be adapted to Mr. Charlesworth's plan in order to perfect them. Improvements in fire-arms are very numerous, and they are most ingenious.—*Daily News.*

The Berlioz Electric Light.

A new electric light exhibited nightly on the steamer *St. Laurent*, at Pier 50 North river, New York city, has attracted a great deal of attention. The *Sun* gives as good an idea of the nature and advantages of this new application of electricity as we should hope to do without an extended description, for which we have not room in this issue:

"This light is produced by the burning of carbon pencils in currents of electricity. The latter are furnished by induction, and without the use of baterles, by an improved form of Nollet's apparatus. This consists of forty series of horse shoe magnets set in a circular frame, within which is an axis bearing sixty-four reels of copper wire, and revolving before the magnets at the rate of three hundred turns a minute. A double current of electricity is thus induced in the copper wires, the one direct as they approach the poles, the other reversed after they have passed them. No device for breaking the currents is used, as it is found that, though the current is interrupted at each reversion, the light is not perceptibly affected unless the interruption exceeds one twentieth of a second.

"The magnetic apparatus is about four feet six inches square; it stands in the engine room of the *St. Laurent*, and is driven by a donkey engine of one or two horse power. The electricity is conveyed to the lantern by wires. The cost of the light is about twelve cents an hour; the same amount of light by gas would cost two dollars. The light is displayed on the *St. Laurent*, through a Foucault lens, which can be turned by hand in any direction, placed on the bridge above the deck. It is perceptible at sea to the remotest distance at which any object can be seen; at three miles the name of a vessel can easily be read by it with a glass. In fogs it is of the greatest value. So it is in entering harbors by night. It will render collisions in the dark almost impossible."

Alloys.

Most metals are capable of uniting with others, the combination forming what are termed alloys. These are chemical compounds; not, as some persons suppose, simply mixtures. In many cases, when one metal unites with another, the alloy gives scarcely any indications of the characters of the component metals. Thus, copper alloyed with aluminum, in the proportion of 90 of the former to 10 of the latter, gives the alloy called aluminum gold. Again, the alloy called Regulus of Venus, so named from its beautiful violet color, consists of equal weights of copper and antimony, neither of which metals is at all similar to the resulting alloy. Some metals, when alloyed, although they undergo no peculiar modification in color, do so with regard to some other of their natural properties, the difference of melting temperature being perhaps the most remarkable. Of this class, plumbers' solder, which consists of 2 parts of lead, fused with 1 of tin, sand thealloys in which these proportions are reversed to 2 parts of tin and 1 of lead, are the best known, and are much more fusible than either of the metals used in making them. A remarkable alloy of this class is that of bismuth, which melts at 500° Fah.; lead, which melts at 600° Fah.; and tin, which melts at 442° Fah.; in the proportions of 8 of bismuth, 5 of lead, and 3 of tin. This alloy melts below the boiling point of water, or 212° Fah., although even the most fusible of its components requires more than double that temperature to melt it. Toy teaspoons are made of this alloy. When used to stir hot tea, the bowls of the spoons all disappear to the bottom of the cup. The alloy of bismuth 8, lead 4, cadmium 2, and tin 2, melts at 160° Fah.; that is 52° below the boiling point of water. There is one more alloy which may be mentioned, on account of its peculiarity of being liquid at the ordinary temperature, there being only one other metal liquid under the same conditions; namely, mercury. This alloy consists of equal parts of potassium and sodium. Both of these metals are solid at the ordinary temperature; but when alloyed in equal proportions, they remain liquid.—*Piesse.*

Faraday.

Faraday once confided to Dr. Tyndall that at a certain period of his career he was forced definitely to ask himself, and finally to decide, whether he should make wealth or science the pursuit of his life. It was a second choice of Hercules. He could not serve both masters; he was therefore compelled to choose between them. After the discovery of magno-electricity his fame was so noised abroad that the commercial world would hardly have considered any remuneration too high for the aid of abilities like his. Even before he became so famous he had done a little "professional business." This was the phrase he applied to his purely commercial work. His friend, Richard Phillips, for example, had induced him to undertake a number of analyses, which produced in the year 1830 an addition to his income of more than a thousand pounds; and in 1831 a still larger sum. He had only to will it, in 1832, to raise his professional business income to five thousand a year. This, indeed, is a wholly insufficient estimate of what he might, with ease, have realized annually during the last thirty years of his life.

To Prepare Nitroglucose.—Two fluid ounces of fuming sulphuric acid, two of common sulphuric, two of strong nitric acid, as near to 1·5 sp. gr. as can be obtained, give good results. The sugar is stirred in, in the form of powder, to a thin paste. The stirring is kept up, and as fast as the nitroglucose separates in doughy masses, it is removed with a glass spatula, and thrown into cold water. A further addition of sugar will give more nitroglucose, but considerably less in proportion than the first addition. As soon as possible the nitroglucose is to be kneaded up with cold water, to get the acid out. When dry, it forms a white doughy mass, having sometimes a crystalline tendency. It is best preserved under water. This substance is more explosive than gunpowder, and is supposed to be identical with Nobel's dynamite.—*Septimus Piesse.*

Traction Engines.—We are having inquiries about this class of engines which we are unable to answer. Manufacturers, we think, would do well to advertise them in our paper.

England is about to adopt the American plan of transporting petroleum, by railroad, in elevated iron cars.

ON SOME CONSTITUENTS OF COTTON FIBER.

Dr. E. Schunck has published a paper on the constituents of cotton fiber, having for its object the throwing of more light on the nature of those substances which are contained in or attached to the framework of cellulose; of which cotton fiber mainly consists, and which are, together with the latter, produced by the plant. All foreign and extraneous matter introduced during the process of manufacture was, therefore, left entirely out of consideration. The author has further confined his attention to those constituents of the fiber which are insoluble in water but soluble in alkaline lye, and are afterward precipitated by acid from the alkaline solution. Whether cotton contains naturally any substance soluble in water, or which being originally insoluble, is rendered soluble therein by the prolonged action of alkalies is a question on which the author pronounces no decided opinion.

For the purpose of obtaining the substances which he proposed to examine, the author employed cotton yarn, which he preferred to unspun cotton for several reasons; the principal being that yarn is comparatively free from mechanical impurities, such as fragments of seed vessels, etc., while, on the other hand, if proper care be taken, no impurity is added to to those previously existing during the process of spinning. The yarn was boiled in an ordinary bachelor's kier for several hours with a dilute solution of soda ash. The resulting dark brown liquor, after the yarn has been taken out, drained, and slightly washed, was removed from the kier into appropriate vessels, and mixed with an excess of sulphuric acid, which produced a copious, light brown, flocculent precipitate, while the liquid became colorless. This precipitate was allowed to settle, the liquid was poured off, and, after being washed with cold water, to remove the sulphate of soda and excess of acid, it was put on calico strainers and allowed to drain. A thick pulp was thus obtained, which, when dried, assumed the appearance of a brown, brittle, horn-like substance, translucent at the edges. In one experiment, 450 lbs. of yarn, made from East Indian cotton, of the variety called "Dhollerah," yielded 0·33 per cent of the dried precipitate. In another experiment made with 500 lbs. of yarn, spun from American cotton, of the kind called in commerce 'middling Orleans," 0·48 per cent was obtained. The total loss sustained by yarn during the bleaching process amounts to about five per cent of its weight. Only a small portion of the matter lost is therefore recovered by precipitation of the alkaline extract with acid.

This precipitate formed more especially the subject of the author's investigation. It was found to consist almost entirely of organic substances, and of these the following were distinctly recognized:

1. A species of vegetable wax.
2. A fatty acid.
3, 4. Coloring matters.
5. Pectic acid.
6. A trace of albuminous matter.

The author described the method employed by him for separating these substances from one another, and obtaining them in a state of purity; and he then gave an account of their properties and composition. The waxy matter is by far the most interesting of these substances. It is insoluble in water, but scluble in alcohol and ether. If a concentrated solution in boiling alcohol be allowed to cool, the greatest part is deposited, causing the liquid to assume the appearance of a thick white jelly, consisting of microscopic needles or scales. When this jelly is filtered off and dried, it shrinks very much, and is converted into a coherent cake, which has a waxy luster, and is translucent, friable, and lighter than water. Its melting point is between 83° and 84° C. At a higher temperature it is volatilized. When heated on platinum it burns with a very bright flame. The author thinks it probable that this substance covers the cotton fibers with a thin, waxy film, and thus imparts to them their well-known property of resisting water. In its properties and composition it approaches very nearly the better-known vegetable waxes, such as that obtained by Avequin from the leaves of the sugar cane, and that which is found on the leaves of the Carnauba palm. The The author thinks that the name *cotton wax* is sufficient to distinguish it from these and other nearly allied bodies.

The fatty acid has the properties and composition of margaric acid. It is white and crystalline, fuses at 53° C., and gives, with alkalies, compounds soluble in water which are true soaps. It is, however, probably not a natural constituent of cotton fiber, but rather an impurity derived from the oil of the seed which escapes and diffuses itself among the cotton before or during the process of ginning. It might also have had its source in the oil and fat used for greasing the cotton-spinning machinery, since the author employed yarn in all his experiments. Persons practically conversant with cotton spinning affirm, however, that if ordinary care be taken, it is impossible that the cotton can become contaminated with anything of a fatty nature during its conversion into yarn.

The coloring matters obtained in these experiments are, without doubt the substances to which raw cotton owes its yellowish or brownish color. The author was able to distinguish two bodies of dark brown color, which occurred in all kinds of cotton examined by him. Of these, one is easily soluble in cold alcohol, and is left, on evaporation of the solution, as a dark brown, shining, brittle, amorphous resin, which is transparent in thin layers. In boiling water it softens and melts to a pasty mass, which becomes hard and brittle again on cooling. When heated on platinum foil it burns with a bright flame, leaving a very voluminous coal. It is nearly insoluble in ether. It dissolves easily in concentrated sulphuric acid and glacial acetic acid, with a brown color. It also dissolves with ease in caustic and carbonated alkalies, giving dark, yellowish brown solutions, from which it is reprecipitated by acids in light brown flocks. The other coloring matter resembles this in most of its properties. It is, however, much less soluble in alcohol. Cold alcohol, indeed, dissolves only a trace, but in boiling alcohol, it is dissolved with tolerable facility, being re-deposited, on the solution cooling, in the form of a brown powder. This powder, when filtered off and dried, forms coherent masses of a color varying from light to dark brown, which are easily broken, showing a dull earthy fracture. Both coloring matters contain nitrogen, and they differ therefore in constitution from true resins, which they resemble in many of their properties. The peculiar color of the so-called "Nankin cotton" is probably due to a great excess of these coloring matters existing in the fiber. It is certainly not caused by oxide of iron.—*Mechanics' Mag.*

The New Atlantic Cable.

The Paris *Moniteur* announced officially, Sept. 24, that the Government concession lately granted in favor of MM. Erlanger and Reuter, of the Franco-American Telegraph Company, authorizing them to lay a submarine telegraph cable between France and America under certain reserved conditions, has become definite and complete; capital to the amount of 27,500,000fr.—the main condition—having been subscribed for the undertaking. The concession for this great work bears date July 6, 1868, and confers the privilege of laying and working submarine telegraphs between France and the United States.

The cable will, as at present proposed, be laid in two sections; the first from Brest to the French island of St. Pierre, off Newfoundland; the second from St. Pierre either to New York direct or to a point between Boston and New York, with a special line to New York. The length of the cable is as follows: First section, from Brest to St. Pierre, 2,325 miles; second section, from St. Pierre to the United States, about 722 miles; total, 3,047 miles.

A contract has been entered into with the Telegraph Construction and Maintenance Company to manufacture and lay this cable for the sum of £920,000.

The financial calculations and scientific experiments of the new company set forth the following results: The power of transmission of the cable is estimated at a minimum of twelve words per minute, which, allowing fourteen hours a day for waste time and only ten hours a day for actual work, and taking three hundred working days in the year, gives, at the rate of £2 per message, an annual income of £432,000. The working expenses of the line are calculated at £30,000 per annum.

In connection with this enterprise it is interesting to state that the French dispatch boat *Travailleur*, from Rochefort, has been ordered to the Mediterranean to assist in laying down the submarine cable to connect the telegraphic lines of Algeria with the coasts of France.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office.

FOR THE WEEK ENDING SEPTEMBER 29, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

82,474.—HORSE RAKE.—John W. Acker, Copenhagen, N. Y.
I claim the foot frame J, when its operating handle, L, is adapted to slide in slots formed in the ends of the bars, G, as herein described, for the purpose specified.

82,475.—PUMPING ENGINE.—Robt. Allison, Port Carbon, Pa.
I claim, 1st, The arrangement of the sliding bar, L, cam slot, q, rods, n n, and bell crank, R, whereby the supplementary valve, K, is operated, substantially as shown and described.
2d, The valve chambers, J', valves, K', and reversed stuffing boxes, h', arranged substantially as shown and described for the purposes set forth.
3d, The arrangement of the piston, w, graduating cock, y, and cylinder, V, with reference to the rod, E, pistons, G G, and main valve, C, as hereby shown and described.

82,476.—MACHINE FOR POINTING HORSE-SHOE NAILS.—Daniel Armstrong, Chicago, Ill.
I claim, 1st, The die-cleaner, V X, pivoted to the plate, A, and operated by the cam, K, in combination with the two part die, O O, as and for the purpose specified.
2d, The combination of the die cleaner, V X, die, O O, guides, n, and punch, H, substantially as described and shown.

82,477.—WEIGHING APPARATUS.—George Babson and John L. Babson, Rockport, Mass. Antedated September 17, 1868.
We claim our improved arrangement of the scale pan rod, C, the arms, b and f, and the pendulum, B, combined with the curve rack, h, employed with the pinion, i, and its dial conductor, m, the whole being substantially as described.

82,478.—SURGICAL SPLINT.—H. D. Ballard, Findlay, Ohio, assignor to himself and Isaac Bonham, same place.
I claim the improved splint, composed of the parts, A and A', provided with the spring-extension joint and with the adhesive straps, all substantially as and for the purpose described.

82,479.—COMPOUND FOR CLEANING SILVERWARE, JEWELRY, ETC.—G. H. Baxter, Geneseo, Ill.
I claim the above described "Yeoman's Magnetic Renewer and Cleanser," composed and operating substantially as and for the purposes set forth.

82,480.—LAMP BURNER.—Edward C Blakeslee (assignor to Benedict and Burnham Manufacturing Company), Waterbury, Conn.
I claim, combining with a perforated base, provided with the vertical strips of metal, F, and cone, C, the bulb, E, and wick tube, B, when the same shall be constructed and arranged to operate substantially as shown, and for the purposes indicated.

82,481.—MACHINE FOR BENDING THE TOPS AND BOTTOMS OF THE BODIES OF TIN CANS.—Ebphalet W. Bliss, Brooklyn, N. Y.
I claim, 1st, The square or pyramidal cam slide, in combination with the rigid central guide, the cam levers, and the four clamping jaws, substantially set forth.
2d, The combination of the cam slide with the swinging levers, M, and treadle, L, substantially as set forth.
3d, The arrangement and combination of the cap, O, lever, P, connecting rod, R, and treadle, S, substantially as described.

82,482.—SEAT FOR RAILWAY CAR.—Hannibal S. Blood, Jefferson, La.
I claim the slotted bar, B, when provided with the double slotted cross arm, C, in combination with the socket pieces, D, and the pins, a, when these several parts are constructed, arranged, and operate substantially as herein described for the purpose set forth.

82,483.—AXLE FOR CARRIAGE.—W. D. Bollinger, Cedar Rapids, Iowa.
I claim axles for wagons, cars, and other carriages, made in two parts, at A and B, and connected together, substantially as and for the purpose described.

82,484.—STUMP EXTRACTOR.—T. J. Booth, Jefferson Line, Pa.
I claim, 1st, The combination, in a stump extracting machine, of a trestle frame, constructed as described, with the tackle drum, and sweep bar, when arranged and operating substantially as shown and described.
2d, The coupling clutch, r r, and its accessory mechanism, when arranged to operate substantially as described, in combination with the drum, tackle, sweep bar, and trestle frame, all as set forth.
3d, The clevises, m, rollers, n, and hooks, p and o, substantially as described in combination with the stump extractor above described, for the purpose set forth.

82,485.—HORSE HAY FORK.—William D. Brooks, Bethany, Pa.
I claim the beveled lever, E, pivoted in the ring, F, and slotted at e, to engage with the projections, d, upon the levers, D, its forward end slotted to work upon the rib, f, in the inner side of the ring, F, said lever, E, adapted to be raised to received the levers, D, by means of the angular lever, G, also pivoted in the ring, F, as herein described for the purpose specified.

82,486.—CASING FOR WATER WHEEL.—James D. Bryson, New Castle, Pa.
I claim a casing for water wheels, consisting of the curb, A, the flange, B, the ring, B', supported upon the guide plates, C, and the gate, D, all constructed and arranged to operate substantially as described.

82,487.—FAGOT FOR BEAM.—Henry T. Buffington, Jr., Buffalo, N. Y.
I claim, 1st, The sectional web plates, A, arranged with their fibres running transversely through the pile, in combination with the longitudinal side binding plates, B, as and for the purpose set forth.
2d, The cross clamp plates, provided with the T-heads, E, in combination with the flange pieces, C, and side binding plates, B, as and for the purpose set forth.

82,488.—DRYING AND BURNING KILN.—Jacob Buhrer, Munich, Bavaria.—Patented in England, February 28, 1867.
I claim a drying kiln, as shown, consisting of a series of compartments placed back to back in a double row, and provided with the openings, g, hot air supply and escape flues, a b c d e and f, and communicating apertures, m and n, in combination with a burning oven, also consisting of a number of compartments similarly disposed to those of the kiln, and provided with the openings, d' and e', all the parts being constructed and arranged as and for the purposes herein set forth.

82,489.—TRACE BUCKLE.—W. G. Bunker, Portage, Wis.
I claim the buckle, consisting of the frame, A, having the cross plate, a, with the sliding plate, B, secured thereto by the slot and pin, b, and having the rigid tongue, C, all constructed and arranged as herein described.

82,490.—FISH NET.—Thomas Cartwright, Davenport, Iowa.
I claim the application of the fyke or net, E D C, to the boat, in the manner described, that is to say, by means of the bow cords, d, attached to the transverse bars, c, and the stern cord, e, attached to the bag, C, as herein set forth and shown.

82,491.—ZINCING OR TINNING BATH.—Frederic Chase, Philadelphia, Pa.
I claim a zincing or tinning bath or vessel, constructed bodily of fire clay, or its equivalent earthy substance, substantially as described.
Also, constructing a zincing or tinning bath of fire clay, or its equivalent, substantially in the manner set forth and described.

82,492.—BRICK MACHINE.—Peter Clark, Brooklyn, N. Y.
Antedated Sept. 24, 1868.
I claim, 1st, The combination, in a machine for making bricks, of an endless chain of molds, A, having detachable sliding bottoms, a, with a suitable pug mill, C, and with compressing and discharging plungers, E F, while said sliding bottoms are successively transferred from the charged molds to those last emptied, to open the one and close the other, all substantially in the manner and for the purpose herein set forth.
2d, The improved mold frames, A, provided with and closed by sliding bottoms, a, and combined in an endless chain, substantially in the manner and for the purpose herein set forth.
3d, The sliding rack, s s, operated by toothed sectors, R, and arranged to engage with and transfer the detachable bottoms, a, of the mold frames, A, from charged molds to those last emptied, substantially in the manner and for the purpose herein set forth.
4th, The combination of a swinging connecting beam, J, links, e, and weighted pawls, f f, with ratchets, S S, on the polygonal wheels, B B, and the endless chain of molds, A A, arranged and operating substantially as and for the purpose herein described.

82,493.—FOLDING CHAIR.—A. Collignon (assignor to himself, C. O. Collignon, and N. Collignon), Closter, N. J.
I claim the parts, A B D and F, constructed, arranged, and combined substantially as shown and described for the purposes set forth.

82,494.—FOLDING CHAIR.—C. O. Collignon and N. Collignon, Closter, N. J.
We claim the combination and arrangement of the stand, A, seat, B, back leg, C, and brace, E, constructed substantially as described, and for the purposes set forth.

82,495.—LAMP BURNER.—William R. Cranna, San Francisco, Cal.
I claim, 1st, The combination, with the base of the burner and its shortened wick tube, and the elevated deflector, of a combined air flue and wick holder, with openings, I, as described, and sleeve or cap, J, supported upon the upper part of said flue and wick holder, substantially as and for the purpose specified.
2d, The combination, with the combined air flue and wick holder, and the sleeve or cap, J, of the perforated casing or jacket by which the same are surrounded, as and for the purposes set forth.
3d, The method of attaching the deflector and of securing it in position, by means of arms, a, fitted into sockets formed on the burner for their reception, in the manner described.

82,496.—TRUNK.—George Crouch, New York city.
I claim, 1st, The combination, with a trunk, A, of a hat or bonnet apartment constructed as described, and located in the tray, C, centrally, as shown, for the purposes set forth.
2d, Giving access to the same, either from the bottom or top of the tray, C, as shown.

82,497.—CHIMNEY COWL.—J. J Currier, Gloucester, Mass.
I claim the combination, as well as the arrangement, of the three frusta, B C D the cover, E, and the tube, A, the whole being connected so as to operate substantially as described.

82,498.—AUTOMATIC BOILER FEEDER.—Job A. Davis, Watertown, N. Y.
I claim, 1st, The combination and arrangement of the water-supply tank, D, the valve pipes, E and F, and inlet tube, G, with the valves, a b and c, substantially as described.
2d, The arrangement of the rod, e, and connection arms, f f f, for simultaneously operating the several valves connected with the supply tank, D, substantially as set forth.

82,499.—SHUTTLE FOR SEWING MACHINE.—Job. A. Davis, Watertown, N. Y.
I claim the combination, with the shuttle and its bobbin, of the spring, C, constructed as described, fitted loosely in the shuttle case, and adjustable by a screw, for the purpose set forth.

82,500.—SAWSET.—Christian Deyhle, Hartford, Conn.
I claim, 1st, The combination and arrangement of rack, b b, screw, d, and spring, a, when used for the purpose of adjusting the inclination of rack, b b, as described.
2d, The supporter, o o.
3d, The saw holders, k and l, when used in combination with rack, b b, and supporter, o, for the purpose set forth.

82,501.—SCROLL SAW.—W. Dobson (assignor to himself and J. W. Mount), Medina, N. Y.
I claim a sheet iron, or other saw-holding loop, c, made very narrow laterally, and with the saw, B, run between guides, F, below the table, A, substantially as herein shown and for the purpose described.

82,502.—ELECTRO-MAGNETIC PRINTING TELEGRAPH.—Pierre Antoine Joseph Dujardin, Lille, France.
I claim, 1st, In a printing telegraph, the construction and application of cross type wheels, oscillating on their common axis, and the mechanical means described, or other equivalents to produce their oscillating motions.
2d, The construction and application of the adjustable inking pad, in combination with the double printing wheels, substantially as described.

82,503.—SYSTEM OF SEEDING AND MANURING.—A. F. Eckhardt, Hamburg, Germany.
I claim the covering of artificially manured seed of all kinds with a case or capsule, insoluble in water, as herein described, using for that purpose the aforesaid process and compound, or any other substantially the same, and which will produce the intended effect.

82,504.—MITER MACHINE.—J. H. Estes, Boston, Mass. Antedated Sept. 16, 1868.
I claim the hinged frame, C, provided with slots, N, for the passage of the saw, and with a plane rest, M, by which the bevel is not only sawed with a saw, but afterward dressed with a plane, all constructed to operate substantially as described.

82,505.—HAY KNIFE.—C. A. Fisher, Geneseo, Ill.
I claim the socket, D, the wooden handle, C, the bend, C', and the blade, A, when the same are formed and combined, substantially as shown and described, for the purposes set forth.

82,506.—COMPOSITION FOR FIRE KINDLING.—W. P. Winkley, Des Moines, Iowa.
I claim the composition of rosin, pitch, charcoal, and bituminous coal, in the proportions and manner substantially as herein described, as a new article of kindling.

82,507.—ELASTIC ROOFING COMPOSITION.—T. E. Wood, Knoxville, Pa.
I claim the elastic roofing composition made of the ingredients and in the proportions herein specified, compounded and applied in the manner set forth.

82,508.—APPARATUS FOR JOINTING CIRCULAR SAWS.—Isaac Frace, Peru, Ind.
I claim the slide support, A, arranged to be connected to the saw mandrel, and provided with the support, F, and slides, D and E, substantially as and for the purpose set forth.

82,509.—ICE CREAM FREEZER.—W. A. Garloch and W. D. Richards, Belpre, Ohio.
We claim the sleeve, K, secured to the cover of the inner case, and having

formed upon its upper end the pinion, J, said sleeve being supported in position to operate the inner case by the continuous dasher shaft only, as herein shown and described.

82,510.—Carriage Spring.—E. L. Gaylord, Terryville, Conn.
I claim, 1st, A spring for wheel vehicles, composed of two bars, bent so as to diverge from each other, from their central parts outward toward each end, and at the same time have a longitudinal, curved, and twisted or torsal form, substantially as shown and described.
2d, The attaching of the ends of the springs to the bolster and axle of the vehicle by means of the swivel clips, F, constructed substantially as shown and described.

82,511.—Brick-Kiln.—William Gilbert, Detroit, Mich.
I claim a progressive burning and cooling kiln, composed of the furnace, C, and cooling room, J, enclosed and separated by the vertically sliding gates G G' G'', and furnished with the inclined track, a b, the fireplaces, E, on either side the furnace, and the chimney, H, all arranged with relation to each other, and operating substantially as and for the purposes herein set forth.

82,512.—Combined Roller and Harrow.—Jacob Ginther, (assignor to himself, William Friend, and William Seibert), Mier, Ill.
I claim the combination of the lever, J, connecting rod, K, elbow lever, H, and connecting-rod, I, with the roller frame, A, and harrow frame, E, substantially as herein shown and described, and for the purpose set forth.

82,513.—Wrench.—John Goodin, Centralia, Ill.
I claim the arrangement of the notched cam wheel, F, pawl, d, spring, e, for the purpose of adjusting the movable jaw on a monkey-wrench, constructed and operating substantially as herein set forth.

82,514.—Caliper.—Thomas Goodrum, Providence, R. I. Antedated September 16, 1868.
I claim the rod, A, in connection with B, and as fitted to its seat, substantially as described, and for the purpose as set forth.

82,515.—Corn Planter.—William B. Goodwin, Effingham, Ill.
I claim the combination, with a corn planting machine, of the marking rods, d6, substantially as and for the purpose described.
Operating the markers, d6, from the crank shaft, d2, by means of the connecting rods, d3, rocker arm, d4, substantially as and for the purpose described.
Operating the dropper slide, by means of the crank shaft, d2, acting on the cam projections, g g, substantially as and for the purpose described.
The arrangement of the hopper, E, plate, f, perforated ends of the dropper arm, d5, and the tubular plows, substantially as and for the purpose described.

82,516.—Propelling Apparatus.—James Granger, Zanesville, Ohio.
I claim the traveling bridge, A, constructed substantially as shown and described, in combination with a chain propelling wheel, and for the purposes set forth.

82,517.—Tanning Compound.—B. F. Gross, Trenton, Tenn.
I claim the tanning compound composed of the ingredients named above, and in about the proportions given, substantially as and for the purposes set forth.

82,518.—Saw Mill.—Allin Hackett, Pittsfield, Me.
I claim, 1st, The gage device, constructed as described, of the plate, S, bearing the roller, P, and jointed at m, to the plate R, which is operated in a recess of the graduated part, U, by means of the feed screw, o, and hand wheel, n, all arranged and operating as described for the purpose specified.
2d, The described arrangement of the setting up mechanism upon the head block, consisting of the sliding block, o, rack c, standards, L M, pointer, h, indicator wheel, d, having the toothed part, e, the pins, e', lever, K, bearing the pawls, a b, the standard I, and slotted notched bar, J, all operating as described for the purpose specified.

82,519.—Apparatus for Distilling Spirits.—Francois Haeck, Brussels, Belgium. Antedated September 16, 1868.
I claim, 1st, A still, having a continuous action, by causing the liquid to flow through a series of channels successively, in such manner that the incoming liquid is restrained from mixing with the outgoing, and so that, in its passage through the still, the evaporation is produced by its travel over steam pipes having independent inlets and outlets, so as to establish an equality, or thereabouts, of heating action throughout the several channels of the still, substantially as specified.
2d, The combination, with the channels of the still, and arrangement over them, substantially as described, of the condensing plate, surface, or vessel, T, essentially as and for the purpose or purposes herein set forth.

82,520.—Steam Slide Valve.—J. R. Hall, Salem, Ohio.
I claim the arrangement of the valve, D, with its chambers, b b1 b2, the recessed followers, e e1 e2, with the central passages, h h1 h2, and the passages, a1 a2 a3, whereby to balance the pressure of steam upon the valve, substantially as herein set forth.

82,521.—Bed Bottom.—William M. Hamilton, Wenona, Ill.
I claim, 1st, The straps, D, having rings, V V, at their ends, in combination with the standards, I, slats, H, and diagonal braces, c c, substantially as set forth.
2d, The standards, I I', plates, J J, springs, C, slats, H, straps, D, rings, V V, and braces, c and E, as and for the purpose specified.

82,522.—Lubricator.—John Harlin, New York city.
I claim in combination with the plug, C, of the lubricator, said plug having parallel apertures, d e, the packing, b, collar, g, and screw cap, D, arranged as described for the purpose specified.

82,523.—Paint Oil.—David R. P. Hill, Morgantown, W. Va.
I claim an improved paint oil prepared of the ingredients, in the proportions and manner substantially as herein described and set forth.

82,524.—Seed Planter.—Andrew J. Holt, Peru, Ind.
I claim, 1st, The hinged lever, E G, for moving the horizontal dropping bar, D, and its mode of disconnection with the wheel, B.
2d, In combination with the above named devices, the mode of applying and using the inclined planes, J J, so as to produce the lateral alternate movement of the dropping bar, D, through the medium of the lever, E G.
3d, The adjustable markers, K K, for the purpose of showing the point where the grain is deposited; and
4th, The application of the rod, M, for arresting the revolution of the wheel, B, at the point of dropping.

82,525.—Galvano-Plastic Process for Precipitating Iron on Molds, etc.—Maurice H. Jacobi and Eugene Klein, St. Petersburg, Russia, assignors to Green, Clay & Co.
We claim the process of precipitating iron on molds, in the manner substantially as and for the purposes herein set forth.

82,526.—Paper Pail, etc.—Augustus Jennings and Isaac Jennings, Fairfield, Conn.
We claim securing the bottom or head, B, formed with an outwardly projecting flange, to the body, A, to the vessel, by means of the metallic binding, C, substantially in the manner herein shown and described.

82,527.—Reversible Railway Chair.—Wm. H. Joeckel, New York city.
I claim the chair consisting of the uprights, A, pivoted seat, B, swinging back, C, and sliding bars, D E, all made, combined, and operating substantially as herein shown and described.

82,528.—Construction of Horseshoes.—P. C. Johnson and Edwin Froggott, Central City, Colorado.
We claim the arms, b d, attached to or formed with the calks, and bent down into holes in the bottom or under side of the shoe, to form a locking device, in combination with the screws, a, substantially as shown and described.

82,529.—Roofing Compound.—Joseph A. Jones (assignor to himself and John Donaldson), Baltimore, Me.
I claim a compound consisting of the ingredients mentioned, and applied to roofs substantially as and for the purposes herein set forth.

82,530.—Carriage Wheel.—J. B. Jones, Sparta, Ill.
I claim the metallic hub, A, provided with a dovetail recess, a, extending circumferentially around it in connection with the wooden spokes, B, with metal sockets at their lower ends, and provided at their inner ends with dovetail tenons, d, fitted in the hub, substantially as shown and described.

82,531.—Corn Planter.—Samuel W. Jones, Bluffton, Ind.
I claim the slide, C, fitted in the seed box or hopper, D, and passing through the staff, A, in combination with the bent lever, E, connected with the slide, C, the lever, B, and the lower spring or elastic part, f, of the spout, F, all arranged to operate substantially as and for the purpose herein shown and described.

82,532.—Grinding Mill.—Frank Kaiser, Buffalo, N. Y.
I claim the construction and arrangement of the serrated drum, B, adjustable curved plate, C, set screws, c1 c1, with notched heads and pawls, o, the hopper, E, oscillating suspended bottom, F, slotted arm, b2, spout, s2, inclined sieve, J, and rock shaft, K, substantially as described, for the purpose specified.

82,533.—Sheep Shearing Device.—Wm. S. Lane, Beaver Dam, N. Y.
I claim a trough for shearing sheep, in combination with a frame, so arranged that it may be adjusted by the foot to suit the operator, and substantially in the manner herein shown and described.

82,534.—Steam Generator.—Victor Langlois, Cherbourg, France.
I claim, 1st, The construction and arrangement of the tubes, a, having the threaded ends, b, and external caps, c, the lead packing, f, rings, A, and plates, P P', substantially as herein shown and described.
2d, The various tools for effecting such work of the plates and tubes as I have described, and also for putting up and off the said movable tubes, substantially as described.

82,535.—Harvester.—Christopher Lidren (assignor to himself and R. Jackson), Lafayette, Ind.
I claim, 1st, The combination of the hubs, b, frame, C, and clutches, E, with the shipping lever, Ex, all these parts being arranged and constructed as herein shown and described.
2d, The arrangement of the two cams, G G', axle, A, forked arm, H, box, I, rock shaft, J, rollers, Jx, and vibrating arm, K, substantially as and for the purpose set forth.
3d, The box, I, attached to the arm, H, and the rock shaft, J, fitted therein as shown, whereby proper adjustment may be made for the wear and tear of the rollers, Jx, and the journals and boxes of the rock shaft, substantially as set forth.
4th, Constructing the rollers, Jx, with oil chambers, n, and providing them with exterior surfaces of leather, m, or other suitable material, substantially as and for the purpose specified.

82,536.—Toy Gun.—Charles S. Locke, Watertown, Mass. Antedated Sept. 17, 1868.
I claim in a toy spring pistol or gun, the arrangement of the magazine within the stock, and so as to project over and in rear of the barrel, and of the passage for conveying the balls from the magazine into the barrel, the whole being as represented.
Also, the arrangement of the passage, e, inclining, with respect to the barrel and to the magazine, as and for the purpose specified.
Also, the trigger catch, as made with the ball receiving and retracting recess, or its equivalent.
Also, the combination of the mechanism for advancing the balls in the magazine, with such magazine the barrel, and the mechanism for effecting the expulsion of the balls from the latter, as specified.
Also, The combination of the sliding cover, f', and the sight, g, with the passage, c, opening out of the barrel, and disposed with respect to it and the magazine, as specified.
Also, the combination of mechanism for retracting and releasing the piston in order that it may be advanced by its spring, such mechanism consisting not only of the peculiar lever trigger catch and trigger combined, and provided with a stud or studs, as described, but of the tube, B, or its equivalent, made with longitudinal and transverse slots, and provided with one or two inclined planes and a spring, the whole being arranged substantially in manner and so as to operate as specified.

82,537.—Gate Fastening.—M. B. Markham, Grass Lake, Mich.
I claim an improved gate fastening formed by the combination of the pivoting arm or bar, D, the three armed bar, E, and the spring catch, F, with each other, said parts being constructed and operating substantially as herein shown and described and for the purpose set forth.

82,538.—Steam Propeller Plow and Cultivator.—John Marquis (assignor to himself and Ole Bergerson), San Francisco, Cal. Antedated September 16, 1868.
I claim, 1st, The construction and application of the cutters, C C C, in form similar to that of a screw, and having bits, b b b, at the ends of the blades, substantially as described, for the purpose set forth.
2d, The attachment of the said cutters or screws, in a diagonal manner, to the rear portion of the frame, at such an angle as to overcome the side draft, and impart to the said cutters, in their rotation, a progressive tendency, substantially as described.
3d, The bars or levers, I I, for raising and lowering the frame and cutters, and employing the axle as a fulcrum for that purpose, substantially as described.

82,539.—Treatment and Reduction of Titaniferous Iron Ore.—Charles Martin, Chancery Lane, and William Barrett and Thomas Stammers Webb, Norton, England.
We claim the methods of treating and reducing titaniferous iron ores for the manufacture of iron, and of applying the slag or cinder produced in such processes, substantially as hereinbefore described and set forth, or any mere modifications thereof.

82,540.—Elevator.—N. L. Milburn, St. Louis, Mo.
I claim, 1st, The arrangement of the endless rope, h 1, with relation to the frame, A, sheaves, k l, pulley, g, shaft, e, drum, f, and platforms, d, whereby the former is applied in two directions to elevate and lower the platforms, as herein shown and described.
2d, The described construction of the frame, A, having the corner guides, a, and central guide, b, for the platforms, as herein shown and described, for the purpose specified.

82,541.—Medical Compound.—George Mohler, Yates city, Ill.
I claim the compound above described, when composed and used substantially as and for the purposes herein set forth.

82,542.—Operating Chair.—James Beall Morrison, St. Louis, Mo. Patented in England December 7, 1867.
I claim, 1st, The combination of a universal joint, C, with slides, f, extending upward and downward from said joint, and provided with suitable grooves, in which suitable pieces, n, fast to the body of an operating chair, are made to slide, constructed substantially in the manner and for the purpose described.
2d, The application of a universal joint, E, constructed in the manner hereinbefore described, to the head rest of an operating chair, in combination with the slotted bar, 2, constructed and arranged and operating together in the manner substantially as specified.
3d, A head rest, F, made with two cushions or head supporters, 12 and 13, in combination with a universal joint, E, and slotted bar, 2, arranged and operating in the manner substantially as set forth and specified.
4th, The arrangement of the cruciformed frames, n, attached to the body of the chair, B, the slides, f, attached to the universal joint, C, in combination with the racks, p, and pinions, m, for elevating and depressing the body of the chair, when constructed and combined in the manner and for the purpose substantially as described.
5th, Arms, D, provided with suitable pieces, v, extending downward, and fitting between guide pieces, w, fast on the sides of the chair, and provided with a pinching screw or other device, to fix the arms in any desired position, substantially in the manner and for the purpose described.

82,543.—Skate.—Edgar Murray, New York city.
I claim the pin, i, guided at one end by the bar or central loop, i', and at the other end by the longitudinal slot, 2, in combination with the clamps, e e, and sliding bar, g, as and for the purposes set forth.

82,544.—Name Plate for Street Lamp.—C. J. O'Hara, New Orleans, La.
I claim the mode herein described of marking or placing the names of streets upon street lamps, by means of a transverse supplemental "name plate," C, when the same is provided with an edge-frame, b, beveled ends, and oblate hooks, c c', and is applied or placed within the lamp, as herein described for the purpose set forth.

82,545.—Tread Power Machine.—Jason P. Pawley, Tiskilwa, Ill., assignor to himself and Franklin B. Ives.
I claim the combined arrangement of the treadle, M, arm, M2, connection, O, spring, N, and shaft, I, substantially as and for the purpose described.

82,546.—Finger Ring.—William H. Peckham, N. Y. city.
I claim, as a new article of manufacture, a finger ring made of cast or rolled metal, with a grooved inner face and with its edges slightly widened to form a bearing surface upon the finger, as herein shown and described.

82,547.—Combined High and Low Pressure Steam Engine.—John C. Pedrick, Washington, D. C. Antedated Sep. 17, 1868.
I claim the arrangement of the valves, i and j, and pipe, k, provided with the flap valve, with reference to the cylinder, as and for the purpose set forth.

82,548.—Steam Pumping Engine.—George W. Perry, Shenandoah city, Pa.
I claim, 1st, The construction of the cam, p, lug, o, wheel, i, arms, k l, and tappets, c c', substantially as herein shown and described.
2d, In combination with the cam, p, lug, o, wheel, i, arms, k l, and tappets, c c', the arms, f f', strap, b, rod, A, segments, v v', and plunger, r, of the dash pot, as herein shown and described.

82,549.—Shaft Bearer.—William Platt, Baltimore, Md.
I claim the shaft bearer, A, provided with a means of attachment to the "billet strap," a hook for receiving the shaft, and a loop for the attachment of the securing strap, D, substantially as described and represented.

82,550.—Boat-Detaching Apparatus.—N. M. Ray, Ellsworth, Me.
I claim the lever, D, tine, d, rod, b, and extension, C c, in combination with a tackle block, A, all substantially as shown and described, and for the purpose set forth.

82,551.—Key Hole Guard.—Christopher Read, Jersey City, N. J.
I claim the tumbler, f, the sliding block, g, and the sliding plate, d, in combination with a door lock, operating substantially as shown and described, for closing and unclosing the key hole, when the door is locked on the outside.

82,552.—Corpse Preserver.—John J. Reicherts, Delaware, Ohio.
I claim a corpse preserver, constructed and arranged substantially as shown and described, that is to say, with the parts, A and B, the ice box, F, and either with or without the ice box, G, the air spaces, M, platform, D, perforated false bottom, L, with the double glass, p p, the whole arranged and operating substantially as and for the purposes set forth.

82,553.—Combined Stalk Cutter and Husker.—John D. Rice, Cyrus B. Rice, Lawson N. Rice, and Elisha Briggs, Jr., Detroit, Mich.
We claim the reciprocating scrapers, I, the connecting rods, S, the crank shaft, Y, the pitman, Z, and eccentric, X, when operating and constructed substantially as and for the purposes set forth.

82,554.—Indicator for Knitting Machine.—J. W. Rist (assignor to himself and Ira A. Hebbard), Rochester, N. Y. Antedated September 16, 1868.
I claim, 1st, The combination of the box or plate of a knitting machine indicator and its indicating band, with a proportion table, substantially as described, to indicate the number of rounds to be knit, and the number of needles to be employed to form a knitted article of any desired form, size, and proportion.
2d, In combination with the above, the adjustable pointer, G, as and for the purposes set forth.

82,555.—Register for Knitting Machine.—J. W. Rist (assignor to himself and John A. Guile; said John a Guile assignor to Ira A. Hebbard), Rochester, N. Y. Antedated September 24, 1868.
I claim the arrangement of the driving spring or latch, b, double stop, d, and ratchet wheel, W, in combination with the set nut, E, and screw, a, substantially in the manner and for the purpose set forth.

82,556.—Cut-off for Steam Engine.—George J. Roberts, Dayton, Ohio.
I claim, 1st, The valves, D E, and the seats, C C, constructed as herein set forth.
2d, The arrangement of the slide, N, cam, m, arm, o, shaft, P, arm, q, and connecting rod, R, as herein set forth.

82,557.—Steam Cooking Apparatus.—Edward Savage, Chicago, Ill.
I claim, 1st, The superheating chamber, C, located at or near the bottom of the cooking apparatus, substantially as described.
2d, The combination of the chamber, A, water vessel, B, and steam chamber, C, connected by the pipes, d e i, all arranged to operate substantially as and for the purpose set forth.
3d, The combination of the coiled pipe, g, superheating chamber, C, water vessel, B, and cooking chamber, A, with the pipes, e i and d, all arranged for joint operation, substantially as described.

82,558.—Fanning Mill.—H. H. Seeley, Hudson, Mich.
I claim, 1st, The window board, E, in combination with the wings, D D, when constructed in a reverse manner from each other, all as herein shown and specified.
2d, The adjustable screen, H, pivoted in the sides of the shoe, F, for the purpose of changing the same to suit any kind of grain, substantially as and for the purposes herein set forth.
3d, The adjustable tail board, I, constructed as described, and operating substantially as and for the purposes herein set forth.

82,559.—Method of Making Eye Bolts or Links without Welding.—George H. Sellers, Phœnixville, Pa.
I claim, in making weldless links, and other similar articles, subjecting the previously swelled up or enlarged end of the bar to the flattening and bulb dies, substantially such as described, for the purpose of transposing the metal from the place where the bolt hole is to be, and driving it toward the perimeter, as any for the purpose herein set forth.

82,560.—Comb.—Joel Smith, Leominster, Mass.
I claim attaching a horn back to the body of a horn comb, substantially as and for the purposes described and set forth.

82,561.—Toy Gun.—Fisher A. Spofford and Matthew G. Raffington, Columbus, Ohio.
We claim providing the barrel of a toy gun with a downward extension or chamber, c, for the reception of the plunger, as described, the trigger raising the plunger out of such chamber, substantially as set forth.

82,562.—Cultivator.—J. C. Stroud, Lockhart, Texas.
I claim, 1st, Adjustably connecting the plow beams, G, with each other, by means of the slotted cross bar, J, to which said beams are bolted, substantially as herein shown and described and for the purposes set forth.
2d, Pivoting the plow beams, G, to the stationary frame, D, by means of the pivoting rod, K, and the pivoting crank rod, L, substantially as herein shown and described and for the purpose set forth.
3d, The combination of the hand lever, O, connecting rod or bar, N, and lever arm, R, with each other and with the rods, K and L, by which the plow beams, G, are pivoted to the frame, D, substantially as herein shown and described and for the purpose set forth.

82,563.—Method of Obtaining Dental Models.—Levi Stuck, Bryan, Ohio.
I claim, 1st, The method of obtaining dental model plates of metal directly from the mouth impression, by casting the metal in a perforated or slitted mouth impression, B, substantially as described.
2d, The employment of a slitter or perforated impression cup, C, substantially as described, in combination with a plaster mouth impression, B, vented through the raised surface, a, substantially as described.
3d, As a new article of manufacture, a metallic dental model plate or die, A, when obtained in the manner substantially as herein described.

82,564.—Machine for Drying and Stretching Fabrics.—Oliver C. Sweet, Albany, N. Y. Antedated September 21, 1868.
I claim, 1st, The adjustable drying frame, C G, suspended, by means of removable tongs, D D, from a suitable stationary bearing, and made contractible or expansible at will, substantially as herein shown and described.
2d, The hinged adjustable drying frame, C G, arranged as described, in combination with the swinging receiving bar, A, substantially as herein shown and described.
3d, The rollers, l, and cords, m, arranged as described, in combination with the bars, g, standard, l, j, sleeve, i, and arms, h, for the purpose specified.
4th, The stretcher frame, C G, when arranged as described in combination with the tongs, D D, bar, A, post, l, and stretcher, K, all made and operating substantially as herein shown and described.

82,565.—Stove Pipe Damper.—George Tamkin, Newburg, N. Y.
I claim the composite rod, composed of the metallic strips, B G, of different expansibility, riveted together and arranged with relation to the damper and stove pipe, as described, whereby the expansion of said rod causes it to move laterally, and thereby to close the damper, as herein shown and described.

82,566.—Guard for Carpet Sweeping Machine.—Gilbert F. Taylor, New York, N. Y.
I claim the placing around the body, A, of a carpet sweeping machine, the pad, C, connected at its ends by the elastic strip, e, so as to be removable at pleasure, as herein described.

82,567.—Steam Generator.—Marshall Turley, Council Bluffs, Iowa.
I claim the arrangement of the separate globular sections, C, with the hollow upward inclined screw arms, D, as herein shown and described.

82,568.—Nail Extractor.—James Tyzick and Henry W. Eskildson, New York city.
We claim an instrument for drawing driven nails, composed substantially of the lever, A, and shackle, L, with their griping points, D and F, and hinged or linked together by the slotted piece, E, the whole constructed to operate in the manner and for the purpose herein described and represented.

82,569.—Awning.—Thomas G. Tyler, New York city.
I claim the awning, having its side slats, B, and curved top slats, A, connected together, to form frames, adapted to slide one within the other, by means of the slotted plates, f, and the plates having headed bolts, substantially as herein shown and described.

82,570.—Device for Unloading Hay.—Garrett Van Sickle, Auburn, N. Y.
I claim, 1st, The combination and arrangement of the binding rope or device with the elevating rope and the combined pulley and hook and its tripping cord, in the manner herein described, whereby the hay or other like material, whatever may be its quantity, is first drawn and compressed into a compact bundle, and then elevated and discharged, as herein shown and set forth.
2d, The combination, with the body of the hay wagon, of uprights, n, and their hooks, for holding and maintaining in position the hay binding ropes, substantially as herein shown and set forth.
3d, A combined pulley and hook, constructed as herein specified and shown in the accompanying drawings.

82,571.—Lathe Chuck.—John R. Washburn, West Stafford, Conn.
I claim, 1st, The detached key, D, carrying the beveled pinion, b, and adapted to fit into a series of apertures, e, formed through the sides of the case, A, to allow the same pinion and key to be applied at either side of the chuck, whereby the key and pinion serve to operate any number of chucks, as herein shown and described.
2d, The key, D, when provided with a pinion, b, attached to its end, in combination with the perforated case, A, jaws, B, and scroll wheel, C, of a lathe chuck, all made and operating as herein shown and described.

82,572.—Tumbler Stand.—J. C. Wharton, Nashville, Tenn.
I claim, 1st, The combination, in a tumbler stand, of the concave tray, A, pipe ring, B, having cocks, i, with the racks, a, or their equivalent, and the revolving scrolls, d, all substantially as shown and described, and for the purpose set forth.
2d, The described arrangement for the caps, h, affixed to the lower end of the curved springs pendent from the outside of the racks, a, with relation to the inclined cocks, i, upon the pipe, B, said spring caps being operated by the tumblers, in the manner shown and described for the purpose specified.

82,573.—Harrow and Cultivator.—A. S. White, Malone, N. Y.
I claim, 1st, A harrow and cultivator, composed of two sides, A A, constructed each of parallel plates, a a, and plate, c, attached to the rear end of the inner plate of the former at an acute angle, the plates, a a, being connected by bolts, b, and the teeth or shares clamped between said plates by the bolts, substantially as shown and described.
2d, Connecting the sides, A A, of the harrow and cultivator to the central plate, B, by means of the curved bars or hooks, ax, passing through it, which bars or hooks pass through holes in the plates, c, and the inner plates, a, of the sides, substantially as shown and described.
3d, The pin, d, fitted in the central plate, B, in combination with the curved bars or hooks, ax, arranged substantially as and for the purpose set forth.

82,574.—Cooking Stoves.—C. Williams, Manchester, N. H.
I claim the arrangement of the hot closet, H, the ash chamber, F, the air heating chamber, I, the fire place, C, the two ovens, A B, and their smoke flues, provided with dampers, as described.
Also, the combination and arrangement of the auxiliary air heating chamber, D, with the fire place, C, the air receiving and heating chamber, I, the ash chamber, F, and the hot closet, H.
Also, the arrangement and combination of the air heating chambers, D I, the hot closet, H, the ash chamber, F, the fire place, C, the two ovens, A B, and their flues, provided with dampers as described.

82,575.—Valve Gear for Steam Engines.—Furman R. Wilson, Philadelphia, Pa.
I claim, 1st, The construction of the levers, H H H, in the manner substantially as described and for the purpose set forth.
2d, The arrangement of the cams, G G, and lever, H H H, and fulcrum or lug plate, J, with reference to the valve rods, E E.

82,576.—Treating Iron Ore, etc.—Henry Aitken, Falkirk, Scotland.
I claim, 1st, Coking iron stone or iron ore upon a perforated platform, through the openings in which, and through a mass of stone or ore, the gaseous products of the coking operation are drawn downward, for the purpose described.
2d, Utilizing the gaseous products of the coking of iron stone or ore, substantially as specified.
3d, The coking or carbonizing of iron ores or iron stones, in combination with carbonaceous or hydrocarbonaceous matter.
4th, The employment of crude oils or tar, or oily or tarry matter, for hardening coked or carbonized iron ores or iron stones.

82,577.—Pocket Book Fastening.—J. C. Arms, Northampton, Mass.
I claim the clasp or fastening, consisting of the plate, C, slide, D, and clip, B, or their equivalents, constructed and arranged to operate substantially as and for the purpose herein described.

82,578.—Corn Planter.—J. N. Arvin and J. M. Whitmore, Valparaiso, Ind., assignors to themselves and A. M. Bennett, Chicago, Ill.
We claim the combination of drum, D, wire, L, cup wheels, C C, lever, F, spring, G, adjustable wire guide, I, arranged to run on journal, J, and ratchet f, constructed to operate as herein specified.

82,579.—Lamp.—James S. Atterbury and Tho. B. Atterbury, Pittsburg, Pa.
We claim a glass lamp bowl and a glass stand, united together by means of a screw socket piece, B, as a new and improved article of manufacture.

82,580.—Sash Holder.—Franklin Babcock, Middletown, Conn.
I claim the combination of the screw socket, A, sliding shoulder, B, with flange, C, stem, a, and spring, b, all as and for the purposes set forth.

82,581.—Door Latch.—Franklin Babcock and Frederick Babcock, Middletown, Conn.
We claim the revolving flanged cam, a, when attached in the concaved ends of the case, A, which is provided with a screw thread on its exterior, all constructed to operate as specified.

82,582.—Composition for Generating Gases in Fire Extinguishers and for other Purposes.—J. F. Babcock, Boston, Mass.
I claim a combustible gas generating composition for use in fire extinguishing and other fluid-ejecting apparatus, when combined with a vehicle for arresting rapid combustion, substantially as described.

82,583.—Chuck Drill.—Q. S. Backus, Winchendon, Mass.
I claim the within described "chuck drill," constructed to operate, substantially as set forth.

82,584.—Washing Machine.—James Ballard, Almond, Mich.
I claim the combination of the sliding bar, H, and its stationary rubber, F, with the swinging bar, G, and levers, L and K, and the tub, all constructed to operate as set forth.

82,585.—Scroll Saw.—C. M. Baxter, Lebanon, N. H. Antedated Sept. 17, 1868.
I claim the combination of the short arms, K, the movable standard, F1 and inclined groove, G, with the screw and crank wheel, H, being so arranged that the strain may be thrown off or on the saw by a single motion substantially as set forth.

82,586.—TORPEDO FOR OIL WELLS.—Elias Beach, Titusville, Pa.

I claim, 1st, The perforated tube, G, arranged and operating substantially as described, for the purpose of communicating ignition of the explosive material at the lower part of the torpedo, as set forth.

2d, The primer cord, C, safety string, E, and cable, D, in combination with the primers, b, substantially as described.

3d, The supplementary cord, F, connected and operating as and for the purpose set forth.

4th, The rod, B, in combination with the primers, b, and cap, A', as set forth.

82,587.—MELALLIC CARTRIDGE.—Hiram Berdan (assignor to the Berdan Fire-Arms Manufacturing Company), New York city.

I claim, 1st, Securing the re-enforce cup in the cartridge shell by means of a projection on the interior of the head of the shell, and an opening or cavity in the bottom of the cup fitting tightly on the said projection, substantially as and for the purpose herein described.

2d, The combination of the patched bullet and the brass cartridge shell, drawn from sheet metal, substantially as and for the purpose herein set forth.

82,588.—PRESERVING FRUIT AND VEGETABLES.—Jose Maria Blanco y Nuño, Havana, Cuba.

I claim the process of preserving fruits and vegetables, substantially as herein described.

82,589.—GRAIN DRYER.—David Bonnell, Oswego, N. Y.

I claim, 1st, The drying cylinder, C, supplied with heated air, in combination with the cooling screen, D3, supplied with cold air, substantially as described for the purposes set forth.

2d, And, in combination with the drying cylinder, C, and cooling screen, D3, the conveyer, supplied with cold air, as described, for the purposes set forth.

3d, And, in combination with the drying cylinder, cooling screen, and conveyer, arranged as shown and described, the furnace and fans for supplying hot and cold air, substantially as described for the purposes set forth.

82,590.—LAMP.—Benjamin S. Boydston, Richmond, Ind.

I claim a lamp, provided with a chamber, separate from the oil chamber, for carrying a supply of extinguishing fluid, or other flowing material, and which is so arranged by means of tubes or their equivalents, that when the lamp is overturned, the extinguishing material is brought in contact with the flame, for the purpose set forth.

82,591.—MACHINE FOR PUNCHING TUBES.—John T. Brigden, Hornellsville, N. Y.

I claim, 1st, The die, A, and sliding wedge, B, as constructed and arranged inside of the pipe, for holding it firmly in place while being punched, and the rod, a, and lever, C, for operating the same and removing the chips or punchings, as herein described.

2d, The hollow tube, A', for receiving the pipe, F, in combination with a slotted plug or supporting piece, placed within said pipe, and the punch, P, eccentric cam, H, lever, G, substantially as and for the purposes herein set forth.

82,592.—POTATO DIGGER.—John Burt, Sturgis, Mich.

I claim, 1st, The combination of the bar, G, semicircular plates, J', provided with adjusting holes, j, and frame, A, all arranged as described, for the purpose of regulating the depth of the shovel.

2d, The shaker, D, shovel, C, slotted arm, d, crank, f, pinion, F, gear wheel, J, and axle, E, all combined and arranged substantially in the manner and for the purpose set forth.

82,593.—BEER COOLER.—David Cammerer, Cincinnati, Ohio.

I claim the combination of the two supporting flanges, I I, perforated at i i, the elevated ridge, G, the double trough, H H', perforated at h h', and the vertically corrugated hollow webs, D1 D2, affording water communication throughout the length of the chambers, C1 C2, or nearly so, the whole being arranged as and for the purposes set forth.

82,594.—LADDER.—E. P. H. Capron, Springfield, Ohio.

I claim, 1st, A ladder, consisting of the parts, A and B, hinged together by the round, b, and having the side rails of each part notched at their ends, so as to lock upon the rounds, n and f, in the manner shown and described.

2d, Hinging the parts, A and B, by means of the round, b, secured to the edges of the side rails thereof, by means of the eyes, e, and loops, o, substantially as shown and described.

3d, In combination with the parts, A and B, hinged as described, the platform, C, provided with the slotted side bars, D, and the series of holes for adjusting the spread of the parts, A and B, substantially as described.

82,595.—WATER CLOSET.—W. S. Carr, New York city.

I claim a water-closet hopper or retainer, formed at the upper end to receive the basin, and at the lower end to connect with the soil pipe, and with a removable section, formed and located so that the swinging pan of the closet can be introduced or removed without necessarily removing the basin from said hopper, substantially as set forth.

82,596.—VALVE SEAT.—A. M. Cheeseman (assignor to himself and John Watson), Trenton, N. J.

I claim the rubber valve seat, a a, secured to its position by metallic thimble, c, substantially as shown and described.

82,597.—REFRIGERATOR.—Samuel Child, Baltimore, Md.

I claim the arrangement of the pan, C, having the waste pipe, D, with relation to the provision chamber, H, the ice chamber, A, and gutter, B, as herein described, for the purpose specified.

82,598.—FOUNTAIN PEN.—Richard H. Chinn, Washington, D C.

I claim the construction of the pen, E, points, D, collar, J, on cylinder, C, when arranged and combined as herein described, and for the purpose set forth.

82,599.—IMPLEMENT FOR LASTING BOOTS AND SHOES.—F. O. Claflin (assignor to himself and A. R. Carman), Brooklyn, N. Y.

I claim the combination of the mechanism for stretching and holding the material to be secured, or the equivalent thereof, with driving mechanism, substantially as and for the purposes described.

82,600.—TURNING WAGON HUB.—W. W. Cleaveland, Coldwater, Mich.

I claim the arrangement of the revolving cutter head, carried in the lateral and longitudinal moving frame, with the fixed arbor revolving the block of which the hub is made, all as herein described.

82,601.—FRUIT BASKET.—Nathan S. Clement, New Britain, Conn.

I claim extending the two parts which form the double bottom and sides, so as to be turned over, and form a top for the box, and so that one of the parts is detachable, the whole constructed and arranged for opening, substantially in the manner herein set forth.

82,602.—CHAIR.—D. E. Colby, Washington, D. C.

I claim the application to the cane-seat chairs of an elastic or slightly yielding rest for the cane strands, of any suitable material, and for the purposes specified and set forth.

82,603.—SASH FASTENER.—Abel Conant, Lowell, Mass.

I claim, in a sash lock, such as described, the construction and arrangement of the long and short sliding bolts, E F, with their inclined lugs or projections, g, and actuating knobs and springs, the said bolts being applied to the window jamb at the point where the sashes meet, in the manner specified, so so that the projecting lugs of such bolts shall move in planes at right angles to the plane of the movement of the sashes, and operate in connection with the upper and lower sash racks, as herein set forth.

82,604.—PAINT OIL.—Vincent Cordier, Paris, France, assignor to John Gatliff and Clement Dietrich.

I claim the paint oil herein described, composed in part of mineral oil, and in part of vegetable oil, and having the proper quantity of drying material incorporated by mixing the litharge or other drier in excess with the linseed or other equivalent vegetable oil, and afterward adding the petroleum, or equivalent tar oil, as herein specified.

82,605.—MACHINE FOR SETTING AND COOLING TIRE.—Jacob Courtleyow, Chariton, Iowa.

I claim the bench, a a a a, attached to the trough, F, together with the slide and axis, constructed, arranged and operated as above described, for the purpose of setting and cooling tire, for the purpose and in the manner set forth.

82,606.—SHAWL STRAP.—Geo. Crouch, New York city.

I claim, in combination with a rigid cross piece, A, constructed substantially as described, the handle, B, and straps, D, for the purposes indicated.

82,607.—MANUFACTURE OF AXES, HAMMERS, ETC.—F. C. Curie, Lancaster, Pa.

I claim, 1st, Converting hammers, axes, hatchets, and similar edge tools, either cast, or made from wrought or cast malleable iron, into steel, by the process substantially as herein described.

2d, Also, the new articles of manufacture, namely, hammers, axes, hatchets, and similar edge tools, made by the process, substantially as herein described.

82,608.—COAL CUTTING MACHINE.—George E. Donisthorpe, Leeds, England. Patented in England Jan. 21, 1864.

I claim, 1st, The so arranging the cutting apparatus of machines employed in getting coal and other mineral that two picks or cutters, or two sets of picks or cutters, may be caused by the engine which actuates them to act alternately, so that one pick or set of picks may make its forward stroke while the other pick or set of picks makes its backward stroke, substantially as herein described.

2d, The combination, substantially as set forth, with the traveling carriage, of a guide rail, a propelling worm on the carriage acting on the rail, clips on the carriage embracing the guide rail, cutting tools mounted on the carriage, and a pressure ram for holding the carriage to its track when working, by pressing against the roof of a mine.

4th, The combination, substantially as set forth, with a carriage traveling on ways, and a locking mechanism for locking the carriage firmly while the cutters are working, of reciprocating cutters, arranged on opposite ends of an oscillating arm or lever vibrating transversely to the line of motion of the carriage, whereby a blow is made at each movement of the piston of the motor, and one cutter may deepen the groove made by the preceding one.

5th, The combination, substantially as set forth, with the cutting tools, of the clearers, i, for removing the coal loosened by the cutters.

82,609.—HEATER AND FILTER FOR BOILERS.—J. J. Doughty, Lake City, Minn.

I claim the arrangement of the horizontal shelves, with their partition pieces, the steam and water admission and discharge pipes, the lime deposit ing shelves, g, the filter, i, and the doors formed in the heater and filter case, A B, through which access may be had to said shelves and filter, substantially as herein shown and described.

82,610.—CHARGING SCALE.—Thaddeus Fairbanks, St. Johnsbury, Vt., and Henry Fairbanks, Hanover, N. H.

We claim, 1st, The within described arrangement of the adjustable bars, A B, etc., so that a portion of the weight of each bar shall be distributed on each side of the center of motion of the frame, M, substantially as and for the purposes herein set forth.

2d, The stops, a b, and balance poise, E, arranged relatively to each other and to the bars, A B, etc., and frame, M, substantially as and for the purpose herein specified.

3d, The friction pieces, J J, arranged as represented, and adapted induce a constant friction against the bars, A B, etc., substantially as and for the purposes herein specified.

4th, The adjustable bars, A B, etc., beam of frame, M m, steps, a b, etc., and pinching screws, O P, etc., when provided with the bearing pieces, o, held loosely between the shoulders, 1 and 2, and adapted to receive the force of the screw in confining the stops firmly, as herein specified.

82,611.—WAGON BRAKE.—Chas. M. Flint, Hancock, N. H.

I claim the arrangement of the brake arm, c, and the slotted plate, g, with the king bolt, the front axle, and the front bar of the perch, the whole being substantially as specified.

82,612.—VISE.—Orlando V. Flora, Madison, Ind.

I claim the combination of the post, G, and bars, B C, with the locking bar J, constructed and operating in connection with the movable jaw, D, substantially as and for the purposes herein specified.

82,613.—MACHINE FOR DRESSING BARREL HOOPS.—James T. Forsyth, Wheeling, W. Va.

I claim, 1st, The circular revolving bed, B, the catch, D, and the spring, F, or their equivalents, substantially as described.

2d, The concentric arc, A, in combination with the knives, H H and K K, substantially as described and for the purpose set forth.

82,614.—STEERING APPARATUS FOR SECTIONAL BOATS.—William Frick, Middletown, Pa.

I claim, 1st, The hinged coupling bar, B B1, when fastened permanently to one boat, and attached to the other by standards, C C, in such manner as to permit a free vertical, longitudinal, and lateral oscillation, but to confine, at the same time, the boats to their relative alignment fore and aft, substantially as set forth.

2d, The combination of said hinged coupling bar, standards, and cross heads, C C, connected by springs, B1, arranged to operate substantially as and for the purpose set forth.

3d, The combination of the wheel, the tiller rope, and the hinged bar connecting the two boats, when arranged to operate substantially as set forth.

82,615.—KITCHEN IMPLEMENT.—John Frisch, Albany, N. Y.

I claim the shovel, A, furnished with a stove lifter at its rear end and having its handle, C, pivoted, as and for the purpose set forth.

82,616.—WRITING TABLE AND CHAIR.—Peter Geiser, Waynesboro, Pa.

I claim, 1st, The combination of the chair, A, socket, C, leg, B, arms, D, and table, F F, substantially as shown and described.

2d, The construction of the table as composed of the parts, E F, substantially as shown and described.

3d, The paper and book holder, as constructed, consisting of parts, G H H I e and e', and their equivalents, substantially as shown and described.

4th, The combination of the paper and book holder with the cover of the table, substantially in the manner shown and described.

5th, The arrangement of the locking device, K, catch, a, and stops, h, substantially as and for purpose described.

82,617.—HORSE POWER.—Peter Geiser, Waynesboro, Pa.

I claim, 1st, The combination and arrangement of the frame, A, and journal box, E, substantially as and for the purpose described.

2d, The combination and arrangement of the vertical shaft, F, and the journal box, E, substantially as and for the purpose described.

3d, In combination with the above, the combination of the ratchet coupling and the shaft, G, substantially as and for the purpose described.

4th, The construction of the frame, A, and the arrangement, with reference thereto, of the journal box, E, shaft, F, gear wheels, B and C, and pins or guards, b b.

5th, The arrangement of the oil passages, e a f and h, substantially as and for the purpose set forth.

82,618.—REAMER AND TAP.—Samuel Glasson, New York city.

I claim the arrangement, herein described and shown, of the tubular stock A, grooved plug, C, cutters, B, springs, s, and swiveled screw, E e, for the purpose set forth.

82,619.—PYROTECHNIC SIGNAL.—H. J. Harris, Shreveport, La.

I claim the trail match or fuse, constructed substantially as described, that is to say, consisting of the slow match or fuse, provided with a series of signal or cannonading balls, pyrotechnic meteors and streamers, or other equivalent devices connected with the slow match by short branch quick matches or fuses, and adapted to be used in connection with the balloon or other equivalent means for elevating and sustaining the same in the air while firing the same, substantially as described.

82,620.—TOOL FOR GAS FITTER.—Jacob Himmer, Hartford, Conn.

I claim an improved combination tool, constructed and arranged substantially as described.

82,621.—HAMMER.—George W. Hubbard, Lowville, N. Y.

I claim the application, to nail hammers, of a nail clamp attachment using for that purpose the chamber, C, the clamp, E, the spring, G, the lugs, I, and screw, F, constructed to operate substantially as herein described.

82,622.—SODA FOUNTAIN.—John C. Kennedy, Chicago, Ill.

I claim, 1st, The pump, B, the three-way cock, D, pipes, C and V, reservoir A, and air pit, F, all arranged and operated substantially as described.

2d, Fountain, A, provided with an air pit and gage tube, as described, pump, B, globe check valve, E, three-way cock, D, and fountain, H, the whole being arranged, constructed, and operated in the manner and for the purpose specified.

82,623.—REVOLVING HARROW.—Baxter Lyon, Mount Pleasant, Ill., assignor to himself and Dana L. Cohembia.

I claim a revolving harrow, the front and rear portions of which, being constructed substantially as described, are connected to each other by a jointed or flexible connection, as and for the purpose described.

82,624.—CLOTHES PIN.—Levi Matthews, Antrim, Ohio.

I claim the double self-adjusting clothes pin, H, constructed as described, and provided with a ring, I, substantially as and for the purposes herein set forth.

82,625.—LET-OFF MECHANISM FOR LOOM.—Patrick McGee, North Providence, R. I.

I claim the combination, with the pad, E, and yarn beam, B, of the toe, a', spring bar, c', lever, d', abutment, R, and pusher bar, l, receiving motion from the sword or any other portion of the loom, and acting through the abutment, R, on the let-off motion, in such manner that the letting off of the warp will be regulated according to the variable diameter of the beam, substantially as herein specified.

82,626.—PUG MILL.—J. C. McKenzie, Adrian, Mich.

I claim, 1st, The chamber or reservoir, F, arranged and employed, in connection with the chamber, E, substantially as described, for the purpose specified.

2d, The pug mill, constructed as described, with the chambers, E F, doors, I, and aperture, e, the horizontal angular rods, O, pug shaft, K, and blades, M M1 M2, all arranged to operate substantially in the manner set forth.

82,627.—ENGRAVERS' VISE.—George N. Munger (assignor to himself and Stillman Moore), New Haven, Conn.

I claim the engravers' vise herein described, consisting of the two jaws, D and E, arranged upon the threaded plate, B, and in the plate, C, so as to be adjusted to grasp the article of regular or irregular form, substantially as herein set forth.

82,628.—BEE-HIVE.—Benjamin F. Nave, Fort Wayne, Ind.

I claim the frame, A, constructed as described, and secured together by means of the rod, x, and nut, x', as shown and described for the purpose set forth.

82,629.—ATMOSPHERIC KNOB.—Orwell H. Needham, New York city.

I claim an atmospheric handle, composed of a flexible face or sucker portion, A, and flexible or elastic knob or knob part, B, having a cavity, b, within it in communication, by a passage, c, with the interior face of the sucker portion or space contained therein, substantially as specified.

82,630.—HUB FOR WAGON WHEEL.—Freeman Nichols, Newport, Ky.

I claim the arrangement described, consisting of the wooden core, with mortises, B, and affording seats on its periphery for the shoulders, G, of the spokes, together with band, D, having mortises, e e', the latter or outer portions being more flaring than the inner, and adapted to form sockets for the taper portions of the spokes, substantially as described and represented.

82,631.—HORSE RAKE.—Hezekiah B. Noble, South Windsor, Conn.

I claim crank, m, plate n, head h, (teeth v, which constitute the rake head,) in combination with the bars f f, rack, u, pawl, e, (for elevating or depressing the rake head), arms, k, lever, p, and holder, q, all arranged and operating substantially as and for the purpose described.

82,632.—CHIMNEY COWL.—Eugene Theodore Noualhier Paris, France.

I claim the tapering concentric pipes or cases, B and C, arranged as represented, relatively to the flue, A, and adapted to receive the wind and deflect it upward, as represented, the space between B and C, being divided in combined with a revolving hood, substantially as for the purposes herein set forth.

82,633.—REFINING LIQUOR.—John S. Oliver, New York city, assignor to John W. Cox and Alexander D. Shaw, same place.

I claim, 1st, The process of separating from spirituous, hydrocarbon, and other liquids, the free or non-condensed gases contained therein, by heating up or separating the liquid into fine particles or spray while in vacuo, by the action thereon of mechanism suitable for the purpose, substantially as herein specified.

2d, The drums, C D, arranged within a vacuum chamber, A, and operating in substantially the manner and for the purposes herein specified.

3d, The combination, with the drums, C D, of the worm, F, arranged within the box, A, substantially as and for the purposes herein specified.

4th, The combination, with the chamber, A, containing the drums, C D, and worm, H, of an air pump arranged to operate substantially as and for the purpose herein specified.

5th, The arrangement of the perforated plates, a b c d, in the box, A, substantially as herein shown and described.

82,634.—BEE HIVE.—J. N. Outten, Caseyville, Ky.

I claim the slops, F F, when arranged and used in combination with the chambers, E E, and honey boxes, of a bee hive, substantially as and for the purposes herein set forth.

82,635.—MANUFACTURE OF SOAP.—Henry A. Pease, Hartford, Conn., assignor to himself and Jeremy W. Bliss, same place.

I claim a soap compound, of the ingredients, in a greater or less proportion, as required, substantially as described.

82,636.—PORTABLE ADJUSTABLE ELASTIC SEAT.—Howard Perkins, Mansfield, assignor to himself and Benjamin S. Leonard, Sharon, Mass.

I claim the construction of the elastic supplementary seat, with its hinges, C, shields, D, and elastic feet, E, combined as herein described, and for the purposes set forth.

82,637.—COAL STOVE.—Albert J. Redway, Cincinnati, Ohio.

I claim the central crown plate, D, having perforated bars, d d, by which it is adjusted relatively to the annular cowl, C, substantially as shown and described.

82,638.—COOKING STOVE.—Albert J. Redway, Cincinnati, Ohio.

I claim, 1st, The removable oven, supported and sliding on transverse angle pieces, and over a flange, on one stove plate, and with a marginal flange fitting into a rebate on the other stove plate, so as to make a joint with the plates at the respective ends of the said oven, substantially as described.

2d, The four sided oven, H, and flue plate, D, so constructed and arranged as to form a non-reverting and continuous flue around the oven, and to be removable to expose the flue plates for cleansing, substantially as described.

82,639.—SELF-ADJUSTING TELEGRAPHIC RELAY.—Lewis H. Reynolds, Goshen, N. Y.

I claim the double electro-magnet, or two electro-magnets, placed in a helix or helices, with their like poles near each other, and attachment to armature or armature bar of common relay, so that their repulsion will counteract or nearly counteract the attraction of armature of common relay to its own magnet.

82,640.—ENDLESS BELT.—Henry Richards and Justus A. Traut, New Britain, Conn.

We claim, as a new article of manufacture, an endless belt, constructed substantially as described.

82,641.—HAY KNIFE.—John L. Ripley, Fremont, Ohio.

I claim, as a new article of manufacture, a hand hay knife, composed of the pointed blade, A, with serrations, x x, on its edge, and connected to the handle, B C, all as herein shown and described.

82,642.—METHOD OF CASTING METALS.—Jacques Rives, Paris, France.

I claim the mold, L, arranged within a vessel, A, having a detachable top, B, and between which and the mold is a body of charcoal, substantially as and for the purpose described.

82,643.—CLASP RING.—Leverett A. Sanford, Wolcott, assignor to himself and Albert Warner, Bristol, Conn.

I claim a clasp ring, made in one piece of metal, and secured by one screw, as an improved article of manufacture, substantially as described.

82,644.—SNAP HOOK.—Leverett A. Sanford, Wolcott, assignor to himself and Albert Warner, Bristol, Conn.

I claim the combination of the hook, a, socket, c, springs, d, pad, k, constructed and arranged substantially as and for the purpose described.

82,645.—RAILWAY RAIL JOINT.—James S. Schoonover, Corry, Pa.

I claim the jaws, B B', provided with the pins or ribs on their inner surface, engaging with the corresponding notches on the bases or flanges of the rails, as shown in Fig. 4, and with the recess, d, for preventing the end play of the clamp, C, in combination with the split wedge, E, and the clamp, C, all constructed and arranged substantially as set forth.

82,646.—CULTIVATOR.—George Seibert and John Seibert, Ashley, Ill.

We claim, 1st, The combination of the frame, the wheels, and two independent axles, F F', with the levers, G, ratchet plates, G', and pawls, H, substantially as and for the purpose set forth.

2d, The combination of the driver's seat, K, braces, I, and interior beams, C" C", so arranged that the latter may be moved laterally by the action of the driver, substantially in the manner set forth.

3d, The combination of the parts last aforesaid with the lever, L, crank, M, and connecting rods, N, substantially as set forth.

4th, The combination of the frame, B, the oscillating beams, C" C", and friction rollers, O, arranged to operate substantially as described.

5th, The combination of the connecting rods, N N, the oscillating beams, C" C", and the eye bolts, N', for regulating the relative position of the plows, substantially as described.

6th, The arrangement of the tongue, A, brace rod, A1, and stud screw, A2, substantially as and for the purpose set forth.

82,647.—RUBBER MAT.—Frederick M. Shepard, N. Y. city.

I claim the combination of a cellular rubber web, substantially as described, with a detachable plate or receptacle, whether the same be flanged or not.

82,648.—GATE.—John A. Smith, Lacon, Ill.

I claim a gate, having side posts, B, cross bar, C, staples, O and o o, spring S, post, E, and pivot, D, constructed, arranged, and operating substantially as herein specified.

82,649.—SAWING AND BORING MACHINE.—Thomas Smith, California, Mo.

I claim, 1st, The pivoted carriage table, U, provided with two curved slots, s s, and operating in combination with two concavo-convex saws, substantially as and for the purpose described.

2d, In combination with the above, the inclined and adjustable table, T, pivoted at e, and operating substantially in the manner and for the purposes specified.

3d, The adjustable, attachable, and detachable support, A', for the driving shaft and wheel, when provided with the swinging leg, A", and so pivoted to the frame, A, of the machine, that its outer end can be elevated or depressed at pleasure, substantially as and for the purpose specified.

82,650.—TUMBLER WASHER.—Daniel M. Somers, N. Y. city.

I claim, 1st, A tumbler holder, consisting of a tubular stem, F, with fixed pendent arms, G, and a jointed arm, G', connected with and operating the valve, H, in an automatic manner, substantially as described.

2d, The arrangement of a turbine within the supply stem, and relatively to the discharge orifices of the outside washer, to give a rotary motion to the latter, substantially as shown and described for the purpose set forth.

3d, The combination of the vase, d, forming a valve, I, with a rotary tumbler sprinkler, substantially as set forth.

82,651.—APPARATUS FOR COOLING AND FILTERING LIQUIDS.—Daniel E. Somes, Washington, D.C.

I claim, 1st, The supply pipe, B, two-way cock, d, and delivery pipes, F B', with the cooler, D, placed in the ground beneath a hydrant or tap, as set forth.

2d, The combination of the supply pipe, B, cooler, D, delivery pipe, B', and filter, H, substantially as described.

3d, The supply pipe, B, two-way cock, d, cooler, D, and ice box, G, substantially as described.

4th, A cooler, tapering toward its and pointed at its lower end, as arranged in relation to supply and discharge pipes, substantially as herein shown and described.

82,652.—CHURN.—Edward Spain, Philadelphia, Pa.

I claim, 1st, A dasher, having inclined perforated vanes, arranged at an angle with respect to each other and to the axis of the dasher, as set forth for the purpose specified.

2d, So perforating the vanes of the dasher that the jets of cream which pass through the said perforations shall be caused to cross each other, as described, for the purpose specified.

82,653.—RAIN WATER CUT-OFF.—John Spear, Carbondale, Ill.

I claim a conduit for water, having pipes, A and B, box, C, elbow, D, partition, E and indicator, G, constructed, arranged, and operating, substantially as specified.

82,654.—FRUIT DRYER.—John Spear, Carbondale, Ill.

I claim a fruit dryer, having sections, A and D, shaft, C, drum, G, flanches, K, shelves, H and d, dampers, c and L, doors, S and M, and hook and pin, Y, constructed and arranged substantially as herein specified.

82,655.—AUXILIARY POWER FOR SEWING-MACHINE.—Greenleaf Stackpole, New York city.

I claim the application to the sewing-machine of an auxiliary power, when used in conjunction with and controlled by the treadle worked in the ordinary manner, to assist the operator, substantially as and for the purpose set forth.

82,656.—WASH BOILER.—O. F. Stedman, Westfield, N. Y. Antedated June 2, 1868.

I claim the concave plate, D, in combination with the tube or tubes, E, and perforated bottom, C, constructed and operating substantially as and for the purposes herein set forth.

82,657.—CLOTHES DRYER.—Henry D. Struss, Brooklyn, N. Y.

I claim the combination of the stretchers, C, having guides, c, at each end, and carrying the clothes line, a, with the corner posts, A, pulleys, n q r, and cords, g, all arranged for operation, substantially as shown and described, for the purpose set forth.

82,658.—COMPOUND SAFE DOOR HINGE.—P. J. Stuhltrager, Philadelphia, Pa.

I claim a compound hinge, constructed and applied substantially as and for the purpose herein described.

82,659.—PUMP.—Claude Ludovic Tavendon, Paris, and Jules Moret, Sèvres, France.

We claim the within-described construction and arrangement of the piston, composed of two valved heads, connected together by a tubular rod or sheath, adapted for the passage of the liquid, as specified, working in a chamber divided into two compartments, S S', by a disk or partition, U, all as and for the purposes herein set forth.

82,660.—COMPOSITION FOR DRESSING HAIR.—Jeremiah C. Tilton, Sanbornton Bridge, N. H.

I claim the composition of matter, made of the within named ingredients, in or about the proportion set forth.

82,661.—POLISHING THREAD.—Wm. W. Trapp (assignor to Tobias Kohn), Hartford, Conn.

I claim, 1st, The combination of two rubber carriages, acting in opposite directions on any one or more threads, substantially as described, with one or more flyers and reels, as and for the purposes described.

2d, The devices, a', c', z, or their equivalents, for stopping and starting the pair of rubber carriages, working in opposite directions upon one thread, so that they are stopped and started at the end of the throw of the crank, substantially as described.

3d, The machine, constructed and arranged substantially as described, having sets or series of rubber carriages on opposite sides of the driving shaft which move up and down together, those on the same side having a motion in opposite directions, thereby balancing the reciprocating motions of the several parts, and causing the least possible jar in the machine.

4th, The two rubber carriages, acting together upon one or more threads, and having a reciprocating motion in opposite directions, to divide and balance the strain upon the thread, substantially as described.

82,662.—BOOT AND SHOE HEEL.—J. W. Tull and Geo. Stevenson, Zionsville, Ind.

We claim the employment of an india-rubber heel for boots or shoes, when used in combination with a letter or metal plate, the said heel and plate being secured together substantially in the manner herein described.

82,663.—METHOD OF CONSTRUCTING COLUMNS, ETC.—George Walters and Thos. Shaffer, Phoenixville, Pa.

We claim, 1st, In the construction of metallic columns and shafts, confining wrought iron or steel plates between external cramping bars or washers, b b, and internal metallic disks, d d, by rivets, upon or around which said disks have been cast, or which are attached thereto, and headed down upon the plate while hot, so that the same, in shrinking, shall closely draw the plate to the disk, in the manner substantially as described.

2d, In combination with the shaft, constructed in the manner set forth, the pointed tip, f, for the purpose set forth.

82,664.—Method of Constructing Columns, etc.—George Walters and Thomas Shafer, Phoenixville, Pa.

We claim the manner of constructing columns or shafts of wrought iron or steel plates, curved or bent on the line of their width, and attached by bolts or rivets to internal rings or disks, so shaped, in relation to said plates, that a space shall be left between them, in order that the plates may be drawn down, and their edges brought into close contact by the compression of said rivets or bolts, substantially as set forth.

82,665.—Journal Box.—Geo L. Weaver, Hartford, Conn.

I claim the combination of the journal box, having annular grooves in the heads, C and D, and corresponding grooves on both ends of the shaft bearings, E, with balls of two different sizes, placed alternately in the annular grooves, the whole arranged and operating as and for the purpose set forth.

82,666.—Pantaloons Stretching Device.—S. C. Wells, Le Roy, N. Y.

I claim the combination of bars, A A, weights, b b, springs, a a, and clamping device, c, substantially as and for the purpose described.

82,667.—Lubricator.—J. B. Wickersham, Philadelphia, Pa.

I claim, 1st, The sleeve, f, formed with a swell upon one side for the introduction of a feeder, in combination with the tube, c, and reservoir, a, for the purposes and as specified.

2d, A lubricator formed with the tube, c, of white metal, for the purposes and as specified.

3d, The combination of the glass reservoir, a, and screw neck at its lower end, with the cup, c, and washer, d, rendered permanently tight by cement, as set forth.

4th, A capillary feeder formed by metal wires or rods, or a tubular strip of metal enclosed in a fibrous covering, so as to form a siphon, as and for the purposes set forth.

5th, The cock, b, and chamber, k, in combination with a capillary feeder and oil cup, substantially as set forth.

82,668.—Farm Gate.—Thos. B. Wickham, Granville, Ohio.

I claim a farm gate, having posts, A, B and C, brace, a, clutch, c, trundles, b and n, gate, E, arm, g, an guide slat, D, constructed, arranged, and operating substantially as specified.

82,669.—Measuring Hights and Distances.—Chas. Wilson, Clifton, Pa.

I claim, 1st, The circular cross lined plates, A and P, with their curved upright bars, G and U, combined and operated as herein described, and for the purposes set forth.

2d, The pivot bars, V, with their adjustable round and square plates, with regulating screws, C and X, constructed and operated as herein described, and for the purposes set forth.

3d, The adjustable target, N, combined and operated with the telescope, Q, as herein described, and for the purposes set forth.

82,670.—Pump.—Chas. A. Wilson, and Wm. R. Dunlap, Cincinnati, Ohio.

We claim, 1st, The combination of the annular valve seats, a b c d, and annular valves, E, when arranged in a vertical series, one above another, and constructed as herein described, so as to act simultaneously around the entire circumference.

2d, In combination with the sections, A B C D, with their described flexible flaps, the annular stops or flanges, G G.

3d, The protuberances, F, on the under side of the sections, B C D, for the purpose explained.

82,671.—Starting Apparatus for Railroad Cars.—Erastus Woodward and Jos. S. Millett, Charlestown, Mass.

We claim the horizontal bar, B, levers, A and C, and anti-friction roller, R, combined with the other described parts, all constructed, arranged, and operating in the manner and for the purpose set forth.

82,672.—Draft Valve in Railroad Car Stoves.—John E. Wootten, Reading, Pa.

I claim a deflector, so combined with the air heating space of a railroad car or stove heater, and with the delivery pipes or orifices connected therewith, that when the car is in motion the said deflector can be made to control the temperature of the car, substantially in the manner described.

REISSUES.

41,419.—Machine for Grinding Saws.—Dated February 2, 1864; antedated January 29, 1864; reissue 3,138.—John G. Baker, Philadelphia, Pa.

I claim, 1st, The combination, with a grindstone or grindstones, of feed rollers, J, the axes of which are parallel, or nearly so, with those of the stones.

2d, Two grindstones, arranged at an angle to respect to each other, and having traversing motion imparted to them, all substantially as and for the purpose herein set forth.

3d, The combination of the expansion cranks, G, with the slotted traverse bar, F.

4th, The combination of the feed roller with the frame, I.

5th, The frame, I, made in two halves, and carrying the feed rollers, J, in combination with the springs, g, or their equivalents.

59,388.—Medical Vacuum Chamber.—Dated November 6, 1868; reissue 3,139.—Geo. Hadfield, Cincinnati, Ohio.

I claim the employment of hand support or rest, substantially as and for the purpose set forth.

Also the sealing cap, F substantially as and for the purposes set forth.

31,599.—Vulcanizing Vessel.—Dated March 5, 1861; reissue 3,140.—Geo. E. Hayes, Buffalo, N. Y.

I claim, 1st, A vulcanizing vessel or oven, having its opening and closing joint, for insertion and removal of the mold, at or near the bottom, by making it of two sections, the upper or enclosing one of which forms the body of the vessel, while its lower section constitutes a base thereto, substantially as specified.

2d, So constructing a vulcanizing vessel, with a flattened bottom, as that the plaster mold, containing the rubber compound, shall be in contact with the inside of the lower part of the vessel, so that the heat from the lamp or other heater shall be applied directly to that part of the vessel upon which the molds lie, substantially as and for the purposes set forth.

3d, A mercury chamber, formed in the upper section of the vulcanizing vessel, the same being constructed and arranged with the thermometer, essentially as described.

4th, The opening ring, C, in combination with the bottom, A, band, D, and cover, E, substantially as specified.

58,940.—Portable Book Clamp.—Dated October 16, 1866; reissue 3,141.—Albert J. Manchester (assignee of Thos. Goodrum), Providence, R. I.

I claim, 1st, A portable book package binder, having the following elements in combination: The clamps, A A, a tightening cord, c, and windlass, C, provided with a ratchet plate and pawl, or equivalent holding device, substantially as described.

2d, The compound handle, B, and windlass barrel, C, in combination with the top binding strips, A, substantially as described.

47,812.—Drill Bit.—Dated May 23, 1865; reissue 3,142.—Horace T. Love, New York city, assignee of Wm. W. Grier and Robert H. Boyd.

I claim a rotating drill or drill bit, whose edges, of diamonds or other hard cutting points, are separated at its forward end by a recess or notch, and are arranged with relation to the axial line of the tool and each other, substantially in the manner and for the purpose described.

Inventions Patented in England by Americans.

[Compiled from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

2,663.—Smoke Consuming Apparatus.—Dillwyn Smith, Burlington, N. J. Aug. 27, 1868.

2,691.—Relieving Coupling for Wire Rigging.—W. H. Shock, Washington, D. C. Aug. 31, 1868.

2,759.—Compositions for the Production of Artificial Stones, Tiles, and Pipes, and Useful also as Cements, Paints, and for Stuccoes.—Geo. A. Frear, Chicago, Ill. Sept. 7, 1868.

Receipts.—When money is paid at the office for subscriptions, a receipt for it will be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgment of their funds.

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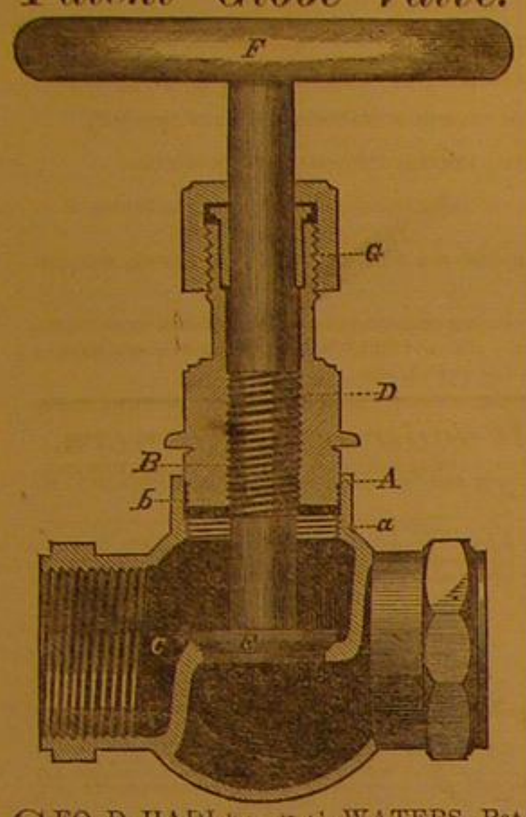
HADLEY'S
Patent Globe Valve.



GEO. D HADLEY & G. WATERS, Patentees. Patented Sept. 8, 1868.

This invention is a new and improved method of constructing Globe Valves for Steam purposes, and consists in forming that part of the valve at which its two main portions are united, in a peculiar way, which makes it, it is believed, simpler, better, and cheaper, than any other valve of its class. The inner surface of the upper portion of the shell, or main body of the valve, is provided at its lower end with a thread, its upper end being left blank, while the outer surface of the lower part of the "stand," marked D in the cut, is threaded at its lower end, and left blank above. Constructed in this way, the most ordinary hand can easily and readily re-grind the valve in and to its seat without disconnection from the pipes, to which it may be attached, and without endangering any threads. The whole exterior surface may be threaded.

The annexed cut represents the cock in vertical central section, clearly indicating all the parts, and plainly showing the improvement. C represents the shell or body of the cock; E the valve; D the stand; A *a* the blank and treaded interior surface of the upper portion of the body of the cock; B *b* the exterior corresponding blank and threaded surface of the stand.

Now, when the screw, *b*, is relieved from the screw, *a*, the valve, E, is bearing upon its seat, it can be readily perceived that the blank portions, A and B, will form a perfect guide for the purpose of re-grinding the valve to its seat, without the necessity of removing the handle, F, or the packing from the stuffing box, G, or the body of the cock itself, from the pipes to which it is attached.

A valve constructed in this way,

1st. Costs no more than the ordinary old style valves.

2d. There are no extra parts liable to get out of order.

3d. No valve can be made simpler or cheaper.

4th. It dispenses with the necessity and expense of any kind of nut or coupling for the parts.

5th. There is no thread upon the outside of the body of the cock to gather dirt and present an unsightly appearance.

6th. The most ordinary Engineer can easily and readily re-grind this valve to its seat, while in place, without disconnection, without removing the handle, without disturbing the stuffing box, & without endangering any threads.

7th. It is confidently believed that this is the best valve of its class in existence.

This valve, and the Letters Patent, are for sale.

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Formal contracts will be necessary when intending to empower us to sell patents, or perform any other transactions of moment.

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CINCINNATI, Sept. 24, 1868.

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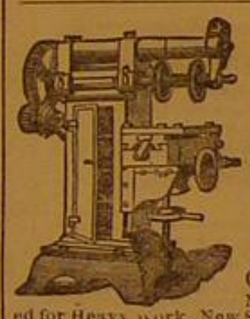

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Patented June, 1868. DAVID JOY'S PATENT
VALVELESS STEAM HAMMER.
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U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 24, 1868.

P. W. Mackenzie, of Orangeville, N. Y., having petitioned for an extension of the patent granted him on the 2d day of January, 1855, for an improvement in "Machine for Blowing Blasts" etc., it is ordered that said petition be heard at this office on the 14th day of December next.

Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
16 3 S. H. HODGES, Acting Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 26, 1868.

Allen B. Wilson, of Waterbury, Conn., having petitioned for an extension of the patent granted to him on the 19th day of December, 1854, for an improvement in "Sewing Machines," it is ordered that said petition be heard at this office on the 7th day of December next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
16 3 S. H. HODGES Acting Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept 25th, 1868.

Jesse W. Hatch and Henry Churchill, of Rochester, N. Y., having petitioned for an extension of the patent granted to them on the 2d day of January, 1855, and reissued on the 24th day of July, 1866, for an improvement in "Machines for Cutting Boot and Shoe Soles," it is ordered that said petition be heard at this office on the 14th day of December next.

Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
16 3 S. H. HODGES, Acting Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 12, 1868.

Martin P. M. Cassity, of Granada, Kansas, having petitioned for an extension of the patent granted to him on the 19th day of January, 1855, for an improvement in "Making Nuts," it is ordered that said petition be heard at this office on the 7th day of December next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
16 3 S. H. HODGES, Acting Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 30, 1868.

Arnton Smith, of Girard, Ill., having petitioned for an extension of the patent granted him on the 16th day of Jan., 1855, for an improvement in "Plows," it is ordered that said petition be heard at this office on the 21st day of December next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed at this office twenty days before the day of hearing.
16 3 S. H. HODGES, Acting Commissioner of Patents

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 21, 1868.

Hannah M. Brown, of Woonsocket, R. I., administratrix of the estate of John E. Brown, deceased, and W. E. Barrett, of Providence, R. I., executor of the estate of Stephen S. Bartlett, deceased, having petitioned for the extension of a patent granted to the said John E. Brown and Stephen S. Bartlett, on the 2d day of Jan., 1855; reissued Jan. 1st, 1861, and again reissued Feb. 25, 1862, in three divisions, numbered respectively 1281, 1282, and 1283, for an improvement in "Grain and Grass Harvesters," it is ordered that said petition be heard at this office on the 14th day of December next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
16 3 S. H. HODGES, Acting Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 18, 1868.

Thomas Slaight, of Newark, N. J., having petitioned for an extension of the patent granted him on the 3d day of January, 1868, for an improvement in "Padlocks," it is ordered that the said petition be heard at this office on the 14th day of December next.

Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.
15 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 9, 1868.

Sylvanus Sawyer, of Fitchburg, Mass., having petitioned for an extension of the patent granted to him on the 24th day of June, 1851, for an improvement in "Machinery for Cutting Rattan," etc., (this application having been authorized by act of Congress, March 2, 1867), it is ordered that the said petition be heard at this office on the 21st day of December next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
15 3 S. H. HODGES, Acting Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 23 1868.

Sylvanus Sawyer, of Fitchburg, Mass., having petitioned for the extension of a patent granted him the 3d day of January, 1855, for an improvement in "Machine for Splitting Rattans into Strips," it is ordered that said petition be heard at this office on the 14th day of December next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
15 3 S. H. HODGES, Acting Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 11, 1868.

Jarvis Case, of Lafayette, Ind., having petitioned for an extension of the patent granted him on the 16th day of January, 1855, reissued on the 16th day of November, 1858, and again reissued on the 17th day of April, 1866, for an improvement in "Seed Planters," it is ordered that said petition be heard at this office on the 21st day of December next.

Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.
14 3 ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE,
WASHINGTON, D. C., Sept. 11, 1868.

George W. Hubbard and William F. Conant, of New York city, having petitioned for an extension of the patent granted them on the 9th day of January, 1855, and reissued on the 18th day of September, 1866, for an improvement in "Operating Slide Valves in Direct Action Engines," it is ordered that said petition be heard at this office on the 21st day of December, next.

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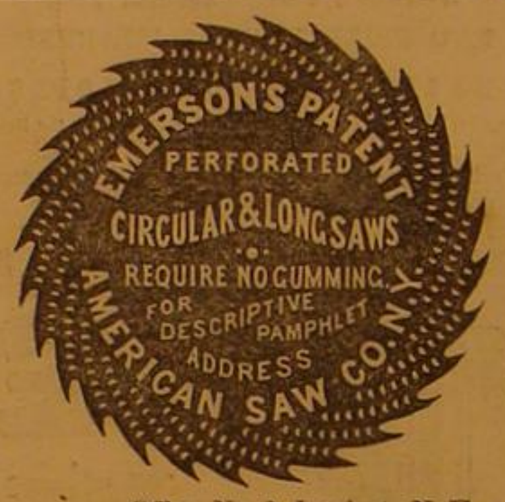

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