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THE PROPOSED GRAND NEW YORK HOTEL.

We transfer to our columns an engraving from the London *Engineering*, which represents Mr. Hiram Cranston's proposed new hotel, which was to have been erected on the Fifth Avenue, opposite the main entrance of the Central Park, covering the block of ground between 59th and 60th streets. The lots of ground, which were to have been the site of the structure, have just been sold at auction,and this has somewhat revived the interest felt in the undertaking. These lots were thirty-four in number. At the sale, eight lots on Fifth Avenue brought an average of $21,012 each; eight lots on Madison Avenue $8,420 each; nine lots on 59th street $8,611 each, and nine lots on 60th street $8,588 each. The aggregate amount of the sales was $395,000; cost of the ground eighteen months since, $350,000. The architecture of the hotel, as seen in the engraving, is noteworthy as being similar to that of public buildings, palaces, etc., in France and some other parts of Europe, but has not hitherto been adopted in this country.

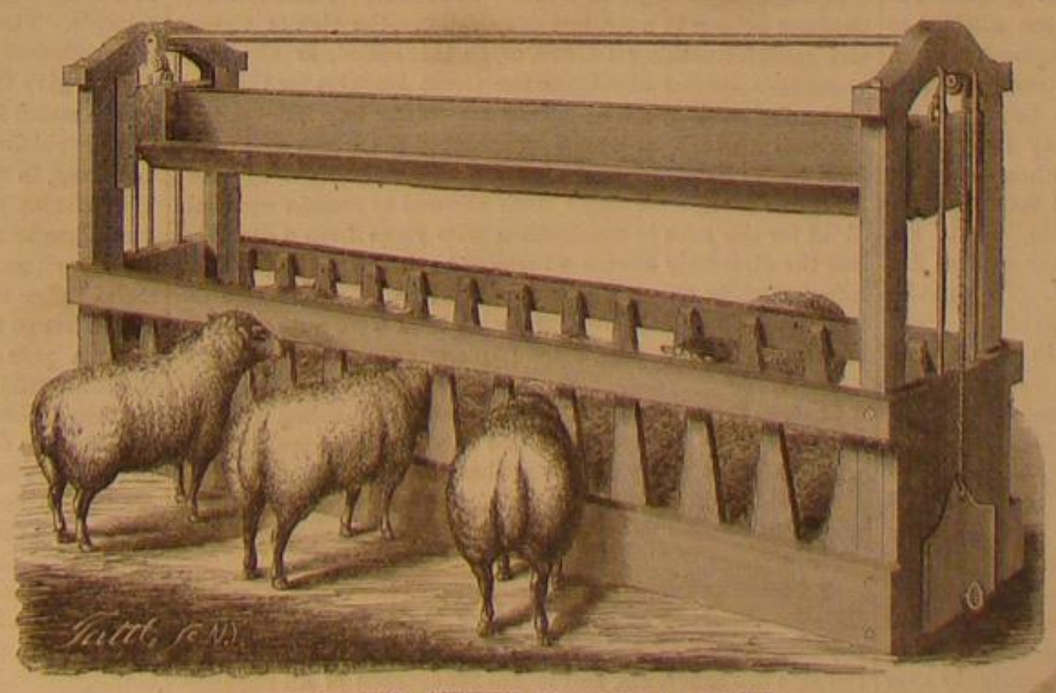


PROPOSED NEW YORK HOTEL OF MR. HIRAM CRANSTON, AT CENTRAL PARK.

Improved Sheep Feeding Rack.

It is well known that sheep waste about as much as they eat when they pull the hay through an ordinary rack, and to save this waste and keep their feeding places clean is the object of the invention exhibited in the accompanying engraving.

The slats are about four inches wide at the top and two at the bottom, and the hay is spread on the bottom of the frame, which may be either a partition or a wall rack. By partitioning the rack, roots may be fed to the animals on one side and hay to those on the other. The sheep cannot trample their food, and will not pull it through to waste it. There is a sliding trough for grain, seen in the engraving elevated, having a partition running lengthwise, which can be elevated while hay is being fed, or lowered when grain is given. While elevated, it is easy to arrange the grain or roots, and the trough is readily lowered by means of the cords and counterweights at the ends. In the use of this device the sheep cannot crowd nor waste.



SEXTON'S SHEEP-FEEDING RACK.

It was patented through the Scientific American Patent Agency, June 5, 1866, by D. F. Sexton, of Whiting, Vt., whom address for further particulars. Parties will also receive attention by addressing J. H. Thomas, Orwell, Vt.

Vessel Caught in the Ice at the Polar Sea.

Dr. Hayes, in his narrative of the open Polar Sea, thus refers to a moment when his vessel was caught in the ice, and its destruction made momentarily imminent:—

The scene around us was as imposing as it was alarming. Except the earthquake and volcano, there is not in nature an exhibition of force comparable with that of the ice fields of the Arctic Seas. They close together, when driven by the wind or by currents against the land or other resisting object, with the pressure of millions of moving tuns, and the crash and noise and confusion are truly terrific. We are now in the midst of one of the most thrilling of these exhibitions of Polar dynamics, and we became uncomfortably conscious that the schooner was to become a sort of dynamometer. Vast ridges were thrown up wherever the floes came together, to be submerged again when the pressure was exerted in another quarter; and over the sea around us these pulsating lines of uplift, which in some cases reached an altitude of not less than sixty feet—higher than our mast head—told of the strength and power of the enemy which was threatening us. We had worked ourselves into a triangular space formed by the contact of three fields. At first there was plenty of room to turn round, though no chance to escape. We were nicely docked, and vainly hoped that we were safe; but the corners of the protecting floes were crushed off, the space narrowed little by little, and we listened to the crackling and crunching of the ice, and watched its progress with consternation. At length the ice touched the schooner, and it appeared as if her destiny was sealed. She groaned like a conscious thing in pain, and writhed and twisted as if to escape her adversary, trembling in every timber from truck to kelson. Her sides seemed to be giving way. Her deck timbers were bowed up, and the seams of the deck planks were opened. I gave up for lost the little craft which had gallantly carried us through so many scenes of peril; but her sides were solid and her ribs strong; and the ice on the port side, working gradually under the bilge, at length, with a jerk which sent us all reeling, lifted her out of the water; and the floes, still pressing on and breaking, as they were crowded together, a vast ridge was piling up beneath and around us; and, as if with the elevating power of a thousand jack screws, we found ourselves going slowly up in the air.

New and Simple Dry Process.

At a late meeting of the London Photographic Society, Mr. William England described a dry process which he has found to fulfill better than any other the conditions required in a dry-plate process of photography. We may here premise that the pictures which were exhibited as having been obtained by means of the process in question were excellent, and in no way inferior to any that could have been produced by means of wet collodion from the same subjects. The plates are exceedingly sensitive, judging from the ordinary dry-plate standard; the certainty seems such as to satisfy even exigeant experimenters, while the keeping properties may be deduced from the fact of one of the pictures exhibited having been printed from a negative kept seven weeks previous to development.

A plate is coated with ordinary collodion and excited in a forty-grain bath. It is then washed until all "greasiness" disappears, by being transferred first to a bath of distilled water, followed by a similar application of common water. Some plain albumen, to which a few drops of ammonia have been added, is now poured over the surface and made to travel over every part of the film, for which purpose it should be several times tilted backward and forward. The film is now washed, so as apparently to remove the albumen, some of which, however, will always remain, no matter how prolonged may be the washing to which it is subjected. The plate now receives a final sensitizing, by having poured over its surface a thirty grain solution of nitrate of silver to which a few drops of acetic acid have been added. The plate is now subjected to a final and thorough washing, and is then dried. The exposure required is about three times that given to a wet collodion plate. A plain solution of pyrogallic acid, of the strength of two or three grains to the ounce, serves to develop all the details which are afterward strengthened in the usual manner (by citric acid and silver),

Mr. England prefers to fix with weak cyanide of potassium, although hyposulphite of soda may be employed for the same purpose.—*British Journal of Photography.*

THE GREAT MARKETS OF PARIS.

Translated for Every Saturday from the French.

There is in the heart of Paris a monument where 1,000,000 mouths seek daily food; in whose neighborhood are to be found street after street which wake when the other portions of the city prepare for sleep; a quarter traversed every night by 12,000 vehicles, and which from 4 to 10 o'clock, A. M., sees added to its 42,000 inhabitants a floating population of at least 60,000 souls; in one word, the Great Markets.

Six uniform divisions, marshalled in two ranks, are sheltered under an immense iron roof, which has a superficies of 20,000 yards. A forest of delicate and elegant small columns support this gigantic roof. Broad sidewalks planted with trees, extend around the vast parallelogram, which is crossed by three broad covered avenues. The six divisions have each their especial trade. One is devoted to fruit and flowers; another to vegetables; another to fish; this to eggs and butter by the wholesale; that to game and poultry; as for the sixth and last, so many different sorts of things are sold there that the Archbishop of Phris himself could not hear to the end the long enumeration of them.

It was when the new Great Markets were opened. Archbishop Sibour had at his elbow a cicerone, whose duty it was to inform him of the destination of the several divisions, as he blessed them one after the other. He had already blessed five of them. When he reached the sixth the cicerone said, "This is the division of retail butter." "I bless the division of retail butter." said the Archbishop, raising his hands. "And of bread," whispered the cicerone. "Of retail butter and bread," added the Archbishop, catching himself. "And of cooked meat." "Of retail butter and bread and cooked meat." "And kitchen furniture." "Oh!" exclaimed the good Archbishop, making a gesture of despair, "I bless everything."

Beneath the Great Markets visible are the cellars. There are thirty of them. As a general rule, each cellar is a basement floor which is an exact copy of the division above ground. There are the same lines of stalls, only instead of the stalls above ground there are lofty recesses, divided by iron railing. with numbers corresponding to the numbers of the shops above them. These recesses are the store rooms of the market people; they keep their stock and baskets in them. They are all alike; except that the fishmongers have, besides, reservoirs supplied with running water, where fishes are kept alive.

In the cellar of retail butter dealers several conscientious tradesmen are to be discovered giving their stock (which is sometimes a little rancid) the desired fresh taste. They mix by gas light on wooden boards their venerable butter, water it, add a little flour if the butter lacks consistency, and if it is too pale they add carrot juice or carmine, which in a few moments gives the palest butter the beautiful orange color so dear to all housewives.

In the next cellar are the poultry shambles. Around eight immense marble tables, placed equidistant from each other and in regular order, are men, women, and children, cutting, clipping, tearing, picking, pulling. They have all been at work since 11 o'clock, P. M., and they will not have ended their task before 5 or 6 o'clock, A. M.: for they have to prepare some 1,000 or 1,200 geese, turkeys, chickens, ducks, or pigeons for the market stalls. Everywhere in the neighborhood of this cellar one sees nothing but baskets full of feathers, baskets full of poultry under sentence of death, heaps of dressed poultry. Here is a line of ducks hanging by one leg, head downward. Presently a young girl comes with a huge knife. Her little hand slips the steel on the neck of the duck nearest her. You would think she was caressing it, she is so rapid and so light. She goes to the next, and to the next, and to the next; a second for each duck. She passes on, her task ended, as quietly as if she had been pricking apples for the oven.

The Great Markets are still quiet, but labor has begun its tasks even above ground. One detects faint glimmers of light through the iron railings of the divisions allotted to fruit and vegetables. If one goes near, one discovers women seated around lamps or lanterns. They are shelling peas. A large number of women earn their daily bread for six months of the year by shelling peas. One may form some conception of the number of peas required, when he is told that Paris consumes during these six months 600,000 bags, say 30,000,000 quarts, of the valuable vegetable. There are some vegetable preservers who employ every season 200 women to do nothing but shell peas for them. They get 30 sous for shelling a large basket which contains 25 pounds of peas. An active woman can shell 50 pounds in her 10 or 12 hours of labor; but then she must not dawdle.

The porters of the Great Markets are organized in an excellent association. Five or six hundred members belong to their society, and they unload and load not only in the Great Markets, but in several important markets. They are divided into gangs, which are subdivided into squads, each having a "boss" or head man. At the Great Markets are to be found the butter porters, the fruit porters, the meat porters, the flour porters, and the others. Markets in Paris have their porters: La Vallée porters, Le Mail porters, Le Marché Noir porters. A head "boss" is invested with the sovereignty over all of them, althogh he does not receive one sou more than any of them. He is the beau-ideal of the constitutional monarch. He is paid little or nothing, and personally has no power, neither to reward nor to punish. The butter porters and meat porters earn their 10 francs a morning. Next to them come the fruit porters, and the fish and flour porters. The latter earn at most 5 francs a morning; to make up this disproportion, the police allow the flour porters to work for bakers, and the fish porters to unload peas. The people we see arranging long narrow bags in lines, like so many sausages, along the sidewalks, are porters of the Great Markets. While a squad work under the eye of their "boss," another squad, stretched at length on the sidewalk, take their rest. They sleep under the feet of passers, their heads covered with their striped cotton caps. Near them lies the white felt hat, with an immense brim, their classical headpiece, which is, however, merely an accessory of their costume, and is not, as is commonly believed, the essential element of it. The porter never wears this hat unless he has sacks to carry, for when he has baskets to carry he places them on a leathern cushion secured to his shoulder, and when he has back baskets to carry he places around his neck a wadded collar, to prevent the friction of the basket. When you see in the Great Markets a tall, stalwart fellow, with merely a moustache, with square shoulders and solid legs, calm, silent, and active, as a general rule you may be sure he is a porter. And when you see a little fellow, fat, well fed, clean shaved, looking like a retired tradesman who is sauntering for pleasure, but bends every moment under the weight of his abdomen and is constantly obliged to take a seat in order to support his own weight, be sure he is a "boss."

As we quit the porters we discover in obscurity the Awakener. He undertakes, for a trifling amount of money, to rouse at any given hour of the night whoever may confide the care of their interests to him. It is a grave question for the laborers of the Great Markets to be roused in due season. He goes about the streets in the neighborhood of the Great Markets from 10 o'clock, P. M., to 4 o'clock, A. M., bawling to this one, ringing up that one, and continuing to bawl and ring until the sleeper gives signs of life by bawling back or tapping on the window. Each customer pays him one or two sous a night, or between thirty sous and three francs a month, according to the distance he is obliged to come. Some customers give him as much as three sous; these are the hard sleepers, who must be pulled out of bed or be shaken by the arm. The Awakener is an enameller by trade, and he can make good days' wages; but he prefers poor nights ill-paid passed out of doors. His trade of Awakener used to bring him in on an average $480 a year.

Near by, on stools, are several men; no shirts; their whole costume consisting of canvas pantaloons, secured by a strap around their waist. They throw vague objects into immense boilers. These strange workmen are artichoke boilers. An active, lively, healthy brunette, the mistress of the establishment, stimulates them by voice and gesture. Her name is Pauline Gandon. She is the largest artichoke boiler of the neighborhood. During four months of the year she does business to the amount of $4,000. In the artichoke season, wagons full of them are daily emptied in front of her door. Women wash them and cut off the stalk. They are then sorted, according to size, and packed in the boilers, the several layers being separated by linen cloths. An immense wood fire is carefully kept up, during the whole period of time required to cook them, and which lasts till daybreak. From 5 o'clock, A. M., to 8 o'clock, A. M., there is quite a procession of green grocers, petty eating-house keepers, and vegetable pedlars coming to purchase their daily supply. In these three hours' time at least 3,000 artichokes are sold. There are not above three or four great artichoke boilers in the neighborhood of the Great Markets, because this business requires not only the appliances to carry it on, but a good many servants and large daily expenditure of ready money.

Let us return to the Great Markets. Already the market gardeners are beginning to spread their stack in trade. They come early to select their place—to secure a favorite corner; and then most of them bring articles which can be sold as soon as the bell announces two o'clock. Here are potatoes, there are salads, yonder are fruits or cresses taken out of the carts and placed on the market. After the marketmen and marketwomen count their baskets, they lie down in the midst of their vegetables. Some of them keep watch, wrapped in their thick cloaks.

Strange figures go to and fro in silence. These uneasy shadows belong to a strange corporation—the clan of vicious and good-for-nothing fellows, or, as it is called, *la Gouape*—vagabonds driven nightly to the Great Markets for the sake of the shelter they afford. They are chiefly lazy fellows, professional thieves, and good-for-nothing workmen dismissed from their places.

Formerly vintner's shops were allowed to remain open all night for the sake of marketmen who come from a distance. But the disorderly scenes witnessed in them led the police to interdict their opening before 3 o'clock, A. M. To lessen the inconveniences of this measure, some men were authorized to hawk coffee among the market gardeners and other nocturnal laborers.

Observe those young fellows with aprons, moving actively from group to group. Each one carries a tin apparatus to which a great many tin boxes, that jingle as he moves, are suspended by hooks. A box contains spoons, and small papers which hold each two lumps of sugar. These are Sausserousses waiters.

Sausserousse is one of the characters of the Great Markets. He rises regularly at eleven o'clock, P. M., and goes to bed the next day at four o'clock, P. M. His establishment is in the Rue des Innocents, and is the rendezvous of all the market-gardeners. They go there to await the opening of their respective markets; they sleep or take a bowl of coffee in this house, which is an old establishment. It is higher than it is wide. It consists of a celler, ground floor above, and first story, placed one on the other. A circular stair case goes to the first story, while a stone ladder goes to the cellar. Each story has its individuality. The first is a dormitory till daybreak. Market men and market women lay pell mell on the floor—these lying lengthways, those sideways, others anyway between the legs of chairs and tables. The fifteen or twenty leagues they have travelled to bring us vegetables are their excuse. Some of them spend all their time on the road, and often pass two months without sleeping in a bed. On the ground floor the customers sleep, seated or standing, but they have not courage enough to acknowledge that they are sleeping. They would persuade themselves that they are eating or drinking. Leaning against the wall, or the shoulder of a good-natured brother market-man, their hand on their cup of coffee, or chocolate, they look as if they would defy sleep; but invaded by the warm vapor which arises form the immense kitchen range built in one of the angles of the room, the movement of the waiters or the momentary elevation of voices, they are unable to keep sleep at a distance.

At Sausserousse's the meal consists of ten sous of meat, five sous of wine, and two sous of bread. There is not much sleeping in the cellar; nevertheless, sonorous snores are occasionally heard mingling with the clatter of plates and forks. The principle section is half filled by two immense copper boilers. It is in these boilers that Sausserousse makes his coffee, and chocolate. He sells about one thousand cups a day at four or six sous each. At least five hundred cups are sold out of doors by those active waiters with tin vessels above mentiontioned. They go their beats around the market several times during the night and until seven o'clock A. M. After ten o'clock the establishment is entirely empty; and if it still remains open half the day, it is partly to give customers time to pay their nights expenses. The majority of them rarely pay cash. They pay after market hours.

Day is breaking. It is time to quit Sausserousse's, if we would witness the Great Arrival. Up to this hour the market men were few and silent as they drove up and discharged their vegetables. They become every moment more numerous. The noise increases; the carts multiply; and all the neighboring street are crowded with them. The quarter is now surrounded by policemen, who allow no vehicle other than market-carts to enter the environs of the market, There are twelve thousand market carts in Paris and the neighborhood which regularly bring vegetables to the city; about six thousand come every day. The apparently inevitable disorder formerly produced by such a throng of market vehicles—to say nothing of purchasers—has been abated by the present organization of the Great Arrival, which was introduced only two or three years ago. At present, every market-man has his particular entrance, his place of unloading, and his particular exit. The road followed by the market-men is regulated beforehand; their vehicles move with perfect order, which is a little surprising when one considers the few policemen on duty. The ingenious organization of the present arrangement is due to the Inspector General, who may every day be seen, between three and five o'clock, A. M., directing the manœuvres like some military commander. "Halt, water-cresses!" "To the left, cauliflowers!" "Go ahead, turnips!" "This way, ye gardeners!" "Put out that hack!" The rustic vehicles move in good order before his eyes. Each market-man as he enters makes a declaration at the clerk's office of the number of bags or panniers he brings, and of the superficies of square yards he wishes to occupy. The cost of the stands is three cents a yard on the outside sidewalks, and six cents a yard on the covered sidewalks. The clerk gives him a ticket, which is his title to possession. He then goes to the portion of the market where the sale of the sort of provisions he brings takes place. There the porters unload his vehicle, and see if the number of bags or baskets is the same as the number stated on his ticket. Then the vehicle is taken to one of the empty vehicle stands. There are no less than fifty-seven empty vehicle stands in the neighborhood of the Great Markets. Formerly the municipal authorities levied the toll for occupying these stands; at present they are leased to a company, which pays $46,600 for the toll. As market men, busily engaged in arranging their stock, would find it inconvenient to drive their vehicles to the proper stand, men have undertaken the business for them. These drivers are twenty in number, under command of a "boss," to whom they pay over their receipts. Their wages are forty cents a day, and the marketmen commonly give them one cent for each vehicle. These drivers give the empty vehicles to the watchmen.

The watch is composed of men and women, who take care of the vehicles confided to them. They form quite a numerous army, in the pay of the company which farms the stands. They not only take care of the vehicles, but of the heaps of provisions temporarily left on the sidewalks by the greengrocers, hawkers, and the like. They are distinguished by the metal badge they wear on the left arm and the steel chain which hangs from their waist. There is at the end of this chain a pair of pincers, closed by a key, and which retains the counterfoil of the little green, white, yellow, or red tickets they deliver for receipts. The color of these tickets serves to designate the sort of heap or the kind of vehicle confided to them. The majority of these watchmen are women. They are for the most part good creatures, and are on excellent terms with their customers, who refuse to call them by their numbers, which they have borne since their new orgar ization. They give them their old nicknames which were in vogue before they were organized by the company which has enlisted them. This one is called "Green Peas," that one "Planks Marie."

At four o'clock, A. M., the market bell rings to announce the opening of the market. None but vegetable dealers have the right to begin to sell as soon as they begin to unload. All the others are forbidden to enter into negotiations with purchasers before this bell rings. Sellers are looking sharp, purchasers are examining the provisions; some men, who seem to be loitering idly, are watching a basket as a cat watches

a mouse. When the bell rings the scene changes into one of the greatest confusion, apparently. Buyers clamor for baskets, and before the bell ceases ringing thousands of baskets have changed hands.

The retail market-women rent the stalls in the Market. Their hours of sale are all the day long. They are the chief go-between of market gardener and buyer. They pay the rent for their stalls (each has her name painted above her stall) by the week, and in advance. The price varies, according to position, from 70 cents to $2.10. There are two other sorts of huckstering. One is carried on by people who buy from the market gardeners vegetables, etc., at the period of the day when they are extremely cheap (for instance, at the close of the market), to sell them when they have risen in value. The other is driven by market-gareeners themselves, who come with empty baskets and buy in the morning from their brethren wherewithal to fill them.

Here a portion of the itinerant greengrocers called hawkers, buy the damaged fruit they hawk at low prices in the quarter of Paris peopled by the laboring classes. There are some 12,000 hawkers daily moving about Paris, who come every morning to the Great Markets for their supplies. They are watched by special inspectors, whose duty it is to see that they do not stop in the streets or loiter in the neighborhood of markets.

BUSINESS AND MANUFACTURING ITEMS.

GLASS IN ILLINOIS.—A correspondent corrects the statement that the manufacture of glass in La Salle was first commenced in 1865. Glass making was first started in La Salle in 1857 by J. P. Colné, who formed a company with $10,000 capital in less than a week, and the factory was just getting into operation, a melting having been already made, when the financial crash of 1857 extinguished the enterprise. Mr. Colné was the first who brought to public attention the utility of this sand, which abounds in many parts of Illinois. The factory was subsequently bought by parties who are now running it.——A glass factory was built at Bellaire, Ohio, last year, and now a rolling-mill and a nail factory are in process of construction.——A glass factory is talked of at Jackson, Mich.

LUMBER.—The lumber manufacture and traffic is the leading business of Fond du Lac, Wis. There are fourteen steam saw-mills and as many steam shingle mills in operation, running each from two or three to seven or eight saws of various kinds, with twenty to fifty men, besides boys and girls for packing lath and shingles, and turning out a grand total, as estimated, of 85 million of lumber, 225 million of shingles, and 18 million of laths, in a season. The lumber is cut and rafted on the affluents of the Fox and Wolf Rivers, in the north-eastern part of the state, where immense pine forests are intersected in all directions by these natural highways. There are five different kinds of shingle mills in use, three of which were invented on the spot. The hands earn about $10 a week on common mill and pinery work—alternating between the two, winter and summer—and engineers, head sawyers and filers get $2.50 a day. A filer in Moore's mill, who works on the eight hour system—eight hours before dinner and eight hours after—earns $5 a day.——The lumber business of Albany, N. Y., engages some twenty-five considerable firms, one of the largest of which handles thirty millions a year. Ten millions of Michigan lumber are sold there yearly by the agent of the Whitneys of Detroit. Large quantities also come from Canada.——There is a portable steam saw-mill at South Carver, Mass., which like Mahomet can go to the mountain if the mountain won't come to be sawed.——A floating steam planing mill is building at Bangor, Me., through which rough cargoes will pass, coming down the stream, and go on their way rejoicing in smoothed and jointed surfaces.

LEATHER.—Leather, boots and shoes, instead of cotton and woolen, according to the Boston *Commercial Bulletin*, are the leading manufacture of New England. The cotton and woolen manufacture is concentrated at a few points; the leather manufacture is dispersed; and although the number of hands employed in the leather business is smaller than in that of cloth manufacture, the amount paid to its operatives in annual wages is considerably larger. The sales of shoes in Lynn amounted in February to $1,011,513; in March to $1,255,454—the largest month's sale ever made in the city. In the manufacture of patent leather, F. S. Merrill, of Roxbury, the largest manufacturer in New England, employs about sixty hands, and has facilities for turning out about 50,000 sides per year, but during the present "dull times" the business has decreased at least one half.——The manufacture of the new leather-splitting machine, by which several hides can be made of one, will soon begin at Newburyport.——The peg factory at Livermore Center, Me., consumes about one cord of white birch per day, and turns out 1,000 quarts of pegs.

WOOLEN.—Burrillville, R. I., comprises ten manufacturing villages, containing twenty woolen mills, with an aggregate of over 100 sets of machinery.——The Tremont and Suffolk Mills, of Lowell, have decided upon a stoppage of half their machinery and the entire cessation of woolen manufacture. Other corporations of Lowell are contemplating similar action. ——A flannel mill is to be built on the site of the old "Endicott Mills," near Newport, R. I., four stories high and containing five sets of machinery. It will be finished about Oct. 1st. ——A woolen mill is to be built at Oneida, N. Y.——A company has recently built a fine woolen mill at Clinton, Lenawee Co., Mich. It will have six sets of machinery and will go into operation about August 1st, employing eighty hands.——An effort is being made to raise $30,000 capital for a woolen mill at St. Clair, Mich., to take the place of Nichols' mill, burned last year.——Parties propose to build at Niles, Mich., within a short time, a woolen mill, a paper mill, and an oil mill.——Stock has been subscribed in part for a new woolen mill at Jackson, Mich., which will cost $50,000 to $75,000.——A foundery and a woolen mill are to be started at Bethany, Harrison Co., Mo., this season.——There are now in operation in the States of Illinois, Wisconsin, Indiana, Iowa, Michigan, Minnesota, and Ohio, about 175 woolen mills, more than half of which have been started since 1860, running 350 sets of machinery, and consuming annually about 8,500,000 lbs. of clean wool.——At San Antonio, Texas, a cotton and woolen mill is being organized.

COTTON.—Most of the mills owned by the A. & W. Sprague Manufacturing Company are in full blast. Besides the Augusta purchase and their extensive works in Central Falls and elsewhere, they carry on the Baltic, 75,136 spindles and 1,973 looms; Quidnick (two mills), 26,880 spindles and 654 looms; Arctic, 22,144 spindles and 560 looms; and Natick (four mills), 40,608 spindles and 975 looms—total, 164,768 spindles and 4,162 looms.——The Kalmia Cotton Mills, in South Carolina, have been sold to a new company for $210,000, subject to a mortgage of $190,000.——It is supposed that work will soon be resumed on the Taft Cotton Mill, at Taftville, Ct., the owners of which recently failed, and which, if finished, will be the largest cotton mill, it is said, in the world.——A. D. Smith, Woonsocket, R. I., is enlarging his cotton mill by two additions, making the whole building three stories high, with a complement of 10,000 spindles.——A cotton mill is talked of at Millport, Chemung Co., N. Y.

IRON.—It is said that Mr. Bessemer now enjoys from his patents for the conversion of iron into steel, the princely income of $500,000 a year.——Messrs. Fairbanks, of St Johnsbury, Vt., the original inventors of the platform scales, although no longer protected by patents, melt up in their manufacture over thirteen tuns of iron per day, and shipped from their works, during ten days in April, 2,923 boxes of scales, weighing over 222 tuns. They are about occupying a new foundery which is one of the completest in the country.——Notwithstanding the prohibitory law, now so energetically pushed in Massachusetts, about 150 hands are employed at East Bridgewater in the manufacture of gins, which were exported to the cotton states, Brazil, etc., to the amount of $500,000, last year.——A very heavy compressing machine is building at Poughkeepsie for the Hudson River Peat Company. The metal used in it weighs 200 tuns, several of the castings weighing one to seven tuns each. It will be driven by an engine of 100 horse-power.——A company has been organized at Albany for the manufacture of Youmans' patent car truck, in which the axles adjust themselves at all times at right angles to the track and radially to the curves.——A new file manufactory is building at Norwich Conn.——Russia sheet-iron works are to be established at Portsmouth, Ohio, which seems in some measure to confirm the reported success of the operation at Youngstown.—The Wrightsville Iron Company, of Columbia, Pa., capital $80,000, have commenced building their furnace and expect to get to work in October next.—— New rolling mills are to be established at Marietta, Ohio, and at Indianapolis, and two furnaces are to be erected at Brazil, Clay Co., Ind.——At Marquette, Mich., five furnaces, a rolling mill, foundery and machine shop, and several other manufactories will soon be in operation. Work has commenced on the new furnace and mill of the Marquette and Pacific Rolling Mill Company, which will employ several hundred hands.—— The Ellis Locomotive Works, at Schenectady, N. Y., are now employing 480 men and turning out a finished locomotive every week, having a contract for twelve from the Union Pacific Railroad Company.——It is computed that the whole number of sewing machines is now 750,000, and that the present rate of increase is 200,000 a year.——The U. S. Railroad Screw Spike Company, at Greenpoint, N. Y., perform something like the novel operation of forging screws, which has been introduced in France. The thread is formed between top and bottom swedges, equivalent to a threaded nut cut in halves, under an atmospheric hammer, the bolt being turned between the blows, until the swedges come together.——A company in Bridgeport is manufacturing the submerged force pump, which is fastened in the bottom of the well or cistern, and projects a rigid iron pipe to the surface, which being oscillated by hand at once operates the mechanism and conducts the stream. No packing is used, and no water can stand in the pipe above the surface of the water, to freeze in cold weather.

THE STEAMSHIPS OF THE GREAT LAKES.—The Western Transportation Company will run this season twelve screw steamers of an aggregate tunnage of nearly 10,000 tuns between Buffalo, Chicago, Milwaukee and Racine. The Buffalo, Cleveland and Chicago line will run eleven steamers, of about 8,400 tuns, between Buffalo, Sheboygan, Milwaukee, Racine and Cleveland. The Buffalo, Cleveland, Toledo and Sandusky line will run thirteen steamers of about 9,800 tuns, between Buffalo, Cleveland, Toledo, Sandusky, Detroit and Green Bay. Evans' line will run six steamers, of about 4,000 tuns, between Buffalo, Chicago, Milwaukee, Racine and Detroit. Charles W. Ensign will run two new vessels, of 1,200 tuns each, between Chicago and Buffalo.

MAINE WATER POWER.—The Kennebec at Augusta has a fall of 15 feet; the Androscoggin at Brunswick has a fall of 50 feet; at Lewiston 64 feet; Emerson's Stream at West Waterville has a fall of 200 feet within five miles. The fall of the water of the Cobbosecontee, at Gardiner, within one mile of the tide-water, is 128 feet; the fall of water in the Vaughan Brook, in Hallowell, within three fourths of a mile of tide-water, is 188 feet.——The citizens of Waterville are endeavoring to raise $75,000 or $100,000 for the improvement of the water power at that place, and the inauguration of extensive manufacturing improvements.

CHEESE.—The cheese factories at Otto, Cattaraugus Co., N. Y., are said to be doing an immense business, and others are starting up in the vicinity—among them one at Ellicottville. ——A cheese factory 40 by 70 and three stories high is in process of construction at West Brookfield, Mass.

OILS AND CHEMICALS.—The buildings of the Manufacturing Company at Coldwater, Mich., have been completed, and the manufacture of linseed oil and corn and oat meal will soon begin. The enterprise, the second of the kind started in the state, will encourage the cultivation of flax, and it is believed that the neighboring region will send to this mill, during the next season, at least 25,000 bushels of flaxseed.——The Pacific Oil Works, at San Francisco, Cal., are now in full operation. The present machinery can consume about 4,000 bushels of flaxseed per week.——The Golden City Chemical Works, recently erected in San Francisco, cost $250,000, and can turn out 20,000 lbs. of sulphuric and 3,000 of nitric acid per day. ——At Sharpsburg, near Pittsburgh, Pa., three oil refineries are being built, one covering an area of seven acres and a river frontage of 700 feet. Two others will each have a capacity for refining 1,200 barrels of oil per week.——The American oil product during the past six years is estimated at about 11,640,670 barrels, for which there have been sunk 7,930 wells, not more than one tenth of which are now believed to be producing oil. In 1859 the product was 325 barrels.

MISCELLANEOUS.—Shoe strings are little things, but very numerous, and in union find strength, at South Carver, Mass., where seventy hands are employed in one shop, making shoe strings and lacings of cotton, silk and linen, to the value of $175,000 annually.——The soapstone stoves appear to find increasing favor, as new buildings are now being erected by the manufacturers at Nashua, N. H., who have a capital of $150,000 invested in the business, and a single order on hand for 7,000 stoves.——Jelly from unfermented apple juice was made at Livermore Falls, Me., to the amount of 16,000 lbs., last season.——A Meriden, Conn., Hat Company has been formed, to make hats by a machine which weaves them whole—capital $400,000.——Boston and East Boston are to be connected by a suspension bridge that will cost half a million.——A bridge is to be built across the Ohio river at Louisville, Ky., 360 feet long and to cost $1,500,000.

PRELLER'S PATENT TANNING PROCESS.

In sole leather tanned by Preller's patent the fibrous structure is entirely preserved, and in a condensed state, of great strength and solidity: comparing with oak-tanned leather by weight as 34 to 50, from 100 pounds of green hide, and showing much less thickness than the distended and weighted leather produced by ordinary processes. On tearing, the latter discloses a felty structure, whereas the former shows all its fibers in their original parallel juxtaposition, and by experiment, resists at one fourth of an inch thickness, in constant working, more strain than the best oak-tanned three eighths of an inch thick. The obvious practical advantages of the lessened bulk and greater flexibility need not be suggested. Butts, it may be remarked, become available, from improved flexibility, for purposes to which they were hitherto unsuited, and by paring them a very large even horsehide may be obtained for many useful purposes, especially carriage tops. Another comparative test which is very suggestive, is that of boiling. Ordinary leather attains in this way a woolly texture and becomes brittle, or else becomes converted into a kind of gelatinous mass. Preller's leather, on the contrary, seems to "boil down" to a tougher, denser, and still fibrous condition, resembling horn. Calf leather, it is evident, will realize similar advantages, of which the last that we shall mention is that it can be tanned in sixteen hours; sole leather requiring but 2½ days. Having these effects in view the tendencies of the process may be the better appreciated. It is as follows:

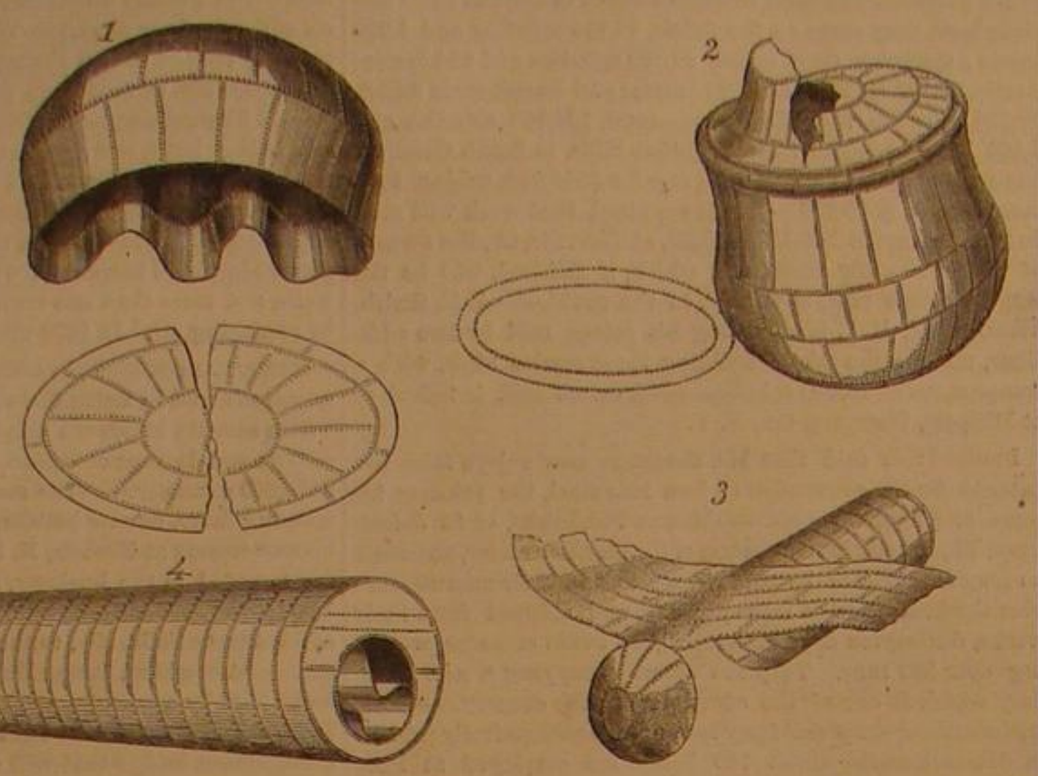
The hides are slightly washed, and then unhaired in the usual manner. Next they undergo a partial drying, and receive a uniform coating of a peculiar paste, which is the main feature of the invention, and is a compound of various vegetable, animal, and saline substances. The vegetable substances are such as contain a large proportion of starch and little gluten—such as barley flour, rice flour or starch itself. The animal substances are of a fatty nature; ox brains, butter, milk, animal oil, or grease. Salt and saltpeter are used merely as preservatives for the brains and the butter. Next the hides are put into the interior of large drums, around the inner peripheries of which a number of stout pegs are disposed radially, the intention of which is to beat up and mellow the hides and to effect an equal distribution of the moisture they still retain, and the complete and uniform absorption of the paste throughout their fibrous system. The drums are driven by a steam engine and to promote a drying action the waste steam from the engine is conducted into them. Having been kneaded forcibly together in this manner for some hours —more or less according to the nature and thickness of the hides—the drums are thrown out of gear, and the hides drawn out. It is now ascertained that the work of absorption and of partial drying has gone on vigorously, and with uniformity, and that the hides not having yet attained the point of saturation, are ready for another supply of the paste and a second turn in the drums. Previous to this, however, they are hung up in an airy part of the room, so as to insure uniformity of color and of substance, which when perfected proves that the conversion of the gelatinous mass has been equal and complete. They are now ready, after a little more drying, for the operations of the currier, who finds that his work is considerably lessened in amount by the effects of the above process. The *Shoe and Leather Reporter* is authority for the above statements.

THE Nashawannuck Suspender Mills at Easthampton, Mass., are to close 18th inst.

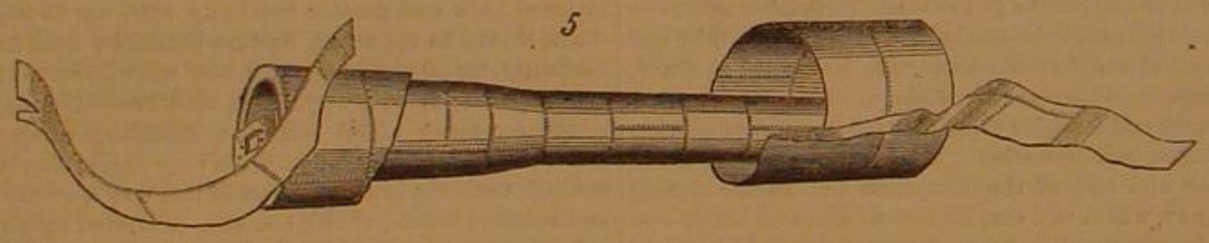
STEAM BOILERS---THEIR FORM, CONSTRUCTION, AND MATERIAL.

NUMBER FOUR.

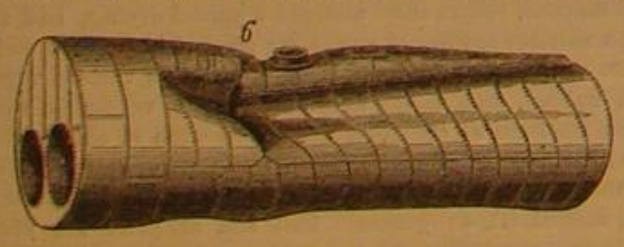
As mentioned in the first of these series of articles, the haystack boilers were made sometimes twelve and fifteen feet in diameter without any internal stays. The bottom of the boilers were concave, somewhat like the bottom of an ordinary junk bottle only in a less degree. Where the bottom joined the sides the joint was strengthened by an angle iron hoop on the inside. Sometimes the outer circle of the bottom for a foot from the circumference was perfectly flat, and the rise of the bottom began at the inner edge of this flat ring. Explosions of this class of boilers have invariably occurred at the bottom, as seen in No. 1. This boiler was without stays having a diameter of fourteen feet. The force of the explosion tore the bottom off all around and rent it in two pieces, while the shell was thrown to a considerable hight and put out of shape by the fall. Another case, but a slighter explosion, is seen at No. 2, where a portion of the bottom gave way and the recoil of the steam and water overturned the boiler. It does not appear that corrosion caused the first of these explosions, but it was probably, owing to the weakening of the sheets by alternate expansion and contraction of the bottom, which gradually but surely cut the angle iron around the rim. In the latter case corrosion might have caused the rupture, as the joint between the bottom and sides appears to have been left intact.



Plain cylindrical boilers have been justly considered a very safe form of boiler when properly set and kept clean. The form used in England has generally crowning or hemispherical ends which are probably much stronger than flat ends, and certainly stronger than flat cast iron heads so much used in this country both for plain cylinder and flue boilers. Yet these boilers do explode, and from their appearance after explosion would seem always to be weakened by corrosion. As in No. 3, they generally open first in a longitudinal seam over the fire where the plates have become deteriorated by the accumulations of sediment and the action of heat. The rupture

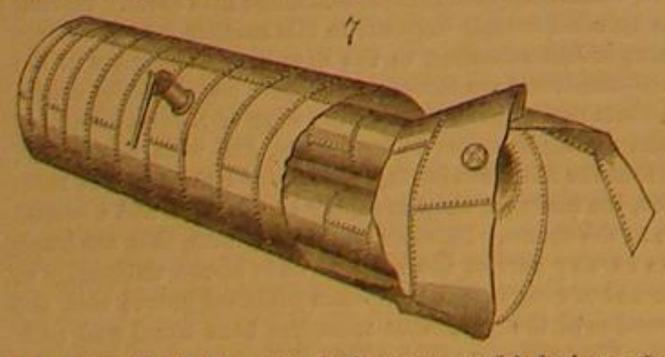


extends to the sound seam beyond the bridge wall and in front to the head, and then runs up the transverse seams at either end of the longitudinal rent, opening the shell out on either side. Sometimes, however, the head blows off and the body of the boiler is thrown violently from its bed. This is often the case where the heads are of cast iron flat; or, the portion nearest the fire is torn without regard to the seams.



The boiler represented in the engraving was thirty-four feet long and five feet six inches diameter.

The single flue or Cornish boiler not unfrequently fails from the collapse of the flue by external pressure. These boilers are internally fired and the flue is of very large diameter proportioned to the shell. The one shown in No. 4 had a shell of thirty-five feet in length by seven feet in diameter, with a tube of four feet diameter. It is evident that the pressure on



the outside of this flue must be immense, and it had no other resistance to offer but its cylindrical form and the strength of the material. Internal tubes, when of large diameter and used for flues, should be as capable of resisting external force as the shell of resisting internal strain. A convenient way of strengthening these flues is by rings. They may be of T-iron, or of plate iron the central portion rolled into a curved form so that a section would resemble a U reversed, with outward projecting flanges on each leg to receive the rivets. This form of ring will allow for expansion and contraction, which will be taken up by the ring and thus reduce the strain on the heads of the boiler. We gave an engraving of this method in our issue of Feb. 2, 1867.

The collapsing of a flue does not necessarily explode a boiler, the damage usually done being by the escape of water and steam. The formation of these flues to an oval as is sometimes practiced, is reprehensible, as any departure from a cylindrical form diminishes the power of the flue to resist external pressure. It will scarcely be credited that a Lancashire or two-flued boiler was collapsed so late as 1865 near Bury, Lancashire, England, by the external pressure of the atmosphere on the shell. It is shown in No. 6.

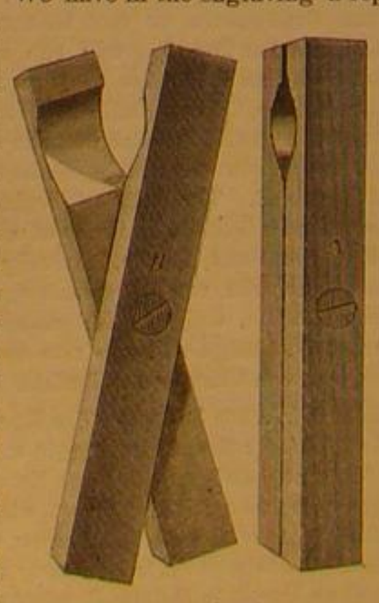
External corrosion is a not unfrequent cause of explosions. It is caused by leakage very often, and where the boiler is covered with brick work it is not always detected in time to prevent serious consequences. Even the tops of boilers will sometimes be perforated by minute holes, the plate being honeycombed. Covering the tops of boilers with ashes is any thing but a safe practice; the leakage, in conjunction with the corrosive solution from the ashes, speedily ruins the plates. Sand as a covering is a good non-conductor of heat, but it hides the mischief which may be continually going on. If a boiler *must* be covered, probably nothing is better than the hair felting so much in use, as while it retains the heat it permits the presence of moisture to be seen by its fibrous texture. It may be questioned, however, whether an uncovered boiler protected by a proper roof is not better than one closely covered in or lagged. It may cost more for fuel, but every leak could at once be seen and corrosion prevented in time.

Another cause of external corrosion is improper material for a foundation. Porous stone or other material which attracts moisture from the earth may rapidly corrode the shell of a boiler. An explosion from such a cause is shown in No. 5 where the shell was rent at the corroded part and the fracture continued spirally around the boiler. In No. 7 also is an explosion from a similar cause operating in a similar manner.

We shall speak further on this subject of corrosion, one of the most prolific causes of explosions.

WARD'S UNIVERSAL CLOTHES PIN.

"Life is made up of little things" and the clothes pin is one of those little things. We have in the engraving a representation of a clothes pin, cheap, simple, and easily handled. It consists of two pieces of wood fastened together by a common wood screw or rivet, upon which the pieces turn as on a pivot. The semicircular recesses at one end engage with the clothes line while the plain surfaces of the other end hold the fabric. A, shows the pin closed as it is when holding the clothes, and B in position to be attached to the line and clothing.



Among the advantages claimed by the inventor are durability, as it cannot split nor come apart, having no strain upon one end which is not resisted by equal pressure on the other; cheapness, permanency on the line, as it cannot blow off or become loosened from the clothes, and the avoidance of freezing clothes to the line, which endangers the tearing of fine and delicate fabrics. It is equally useful for dry goods and hardware dealers in exhibiting their wares, and also for photographers for drying their sheets.

It was patented through the Scientific American Patent Agency Feb. 19, 1867, by W. G. Ward For rights and for the pins, address Hiram Hughes, Savona, Steuben Co., N. Y.

KIPS AND ALLMENDINGER'S OILER.

The usual apparatus for oiling overhead shafting is simply a common oil can attached to a light rod of wood, which is an unhandy contrivance and liable to waste the oil. When a ladder is used the labor of oiling a long line of shafting is excessive and not unattended with danger. But the oiler herewith illustrated seems to be an excellent device for oiling open to none of these objections. The engraving is a section, A being the oil reservoir and also performing the functions of an air chamber. To the bottom of this is attached a pipe—quarter inch brass pipe is large enough—of sufficient length to reach the highest or lowest point to be oiled. At the bottom of the pipe is attached a bag, B, of india-rubber, by compressing which a jet of air is forced through the pipe. An extension of the pipe curves upward into the top of the oil reservoir. Rising through a stuffing box at the top of the reservoir is another pipe, C, which can be depressed to the bottom of the reservoir or elevated to the top, and is prevented from coming entirely out by a button on the lower end. A curved nozzle, D, can be attached to this pipe for overhead oiling. The lever, E, is pivoted to the pipe at a short distance above the compressible bag, B, and carries a conical plug that fits into a hole in the side of the pipe, having an elastic packing around it.



The operation is as follows:—In oiling overhead the curved nozzle is attached to the discharge pipe, which is pushed down to near the bottom of the reservoir. In the action of compressing the bulb, the handle of the lever, E, is depressed which closes the side hole in the pipe and makes it air tight. The air thus forced into the reservoir presses upon the surface of the oil and ejects it through the nozzle, D.

In oiling below the position of the operator the curved pipe is not required. The pipe, C, is drawn up and the hole in the side of the pipe left uncovered. The inlet of the air through this aperture presses the oil out of the discharge pipe in the usual way. The hole in the pipe may be closed by a slide valve or the finger placed over it, instead of using the lever in the manner shown in the engraving.

This invention was patented through the Scientific American Patent Agency, Feb. 12, 1867, by John Kips and William Allmendinger, who may be addressed relative thereto, at Morrisania, N. Y.

Improvement in Mirrors.

The manufacture of looking glasses and mirrors by coating with quicksilver, a protracted and life-destroying process, is to be dispensed with, according to a report by M. Salvetat, of the Paris committee on chemical arts, by a new invention which is to work a revolution in the decorative art, in windows and in mirrors, all at once. The French are always about to do something wonderful, and sometimes do it. The present wonder is a glass at once translucent and reflecting, so that it may be a window glass or a looking glass, or both, according to position. It is prepared by coating with a mixture of chloride of platinum, essence of lavender and a dissolvent composed of litharge and borate of lead. The other ingredients being then driven off by heat, the platinum is firmly deposited in an attenuated film, presenting a brilliant reflecting surface against the glass, yet transmitting a softened and agreeable light. The film is said to be perfectly fixed, and evidently may be applied for decorative purposes in endless forms and with either the most delicate or gorgeous effect, while its durability as against oxidation is of the first order. Thus a plate window may be at the same time a mirror, or it may be at once adorned and shaded with the pattern of a lace curtain which will show white toward the street and enliven the interior with its soft brilliancy, or the sides and effects may be reversed.

Steam Rollers, weighing twenty tuns and driven by engines of twelve horse power, are used in Hyde Park for solidifying and smoothing the carriage ways.

Improved Gate for Carriage Ways.

The engravings give views of a convenient gate to be operated either from the carriage or on foot. The model acts well and appears to give promise of being equally effective as an ordinary sized carriage gate. Its operation is prompt, the working parts being strong and direct acting.

Fig. 1 is a perspective view of the gate closed, with its appurtenances. Fig. 2 is a view of the main working parts. By reference to the letters on Fig. 2 the operation of the gate can be readily understood. The gate is swung at one end to a post by cars in which pivots turn, the top one being seen plainly at A, Fig. 2. At the other end is a spring latch from which is led a rod, B, connecting with a forked, curved lever, C. Passing through the fork of this lever is a horizontal shaft turning in suitable bearings, having on one end a spur or chain wheel with which a chain, D, engages, the ends of which are attached to the ends of the elevated levers seen in Fig. 2. At the other end the horizontal shaft carries a bevel gear, which is not rigidly secured to the shaft but is actuated by a pin on the shaft traversing a semi-cylindrical slot in its hub. When by pulling upon either suspended lever, the shaft, through the medium of the chain, is caused to rotate, the first action is to engage a pin on the shaft with a curved portion of the forked lever, C, throwing it back and by the rod, B, drawing back the spring catch and unlocking the gate. In the mean time the bevel gear remains stationary until the latch is withdrawn, when the pin which gives it motion engages with one end of the annular slot and causes it to turn, when it moves the segmental gear, E, and swings the gate around to a right angle to its former position, and its latch end catches in the locks seen in Fig. 1 on the upright posts which support the opening levers. The machinery is defended from the weather by the cap on the hinge post and a metallic covering over the segmental gear, E.

It will be seen that always, from whatever direction a person approaches, the gate, when opened by pulling the outer end of the suspended lever down, swings away from the operator, so that no annoyance can be caused by having the gate move toward the horse if the person is in a carriage or on horseback. After passing through, the gate can be closed by pulling on the opposite lever, the action of which liberates the catch which holds the gate in an open position.

This gate was patented through the Scientific American Patent Agency July 3, 1866, by Charles Dixon and S. H. Close, of Port Byron, N. Y., who will answer all communication relating thereto.



DIXON & CLOSE'S CARRIAGE GATE.

COMSTOCK'S LUMBER WAGON RACK.

Our attention has been called to some errors in the description of Comstock's Lumber Wagon Rack recently published. The engraving is perfect and the working of this improvement can readily be seen when it is understood that when the rack is set for loading, the forward and middle rollers rest upon the forward bolster and center cross bar to frame, and the hind roller drops behind and below the hind bolster, the load resting upon the two forward rollers and the hind bolster. The chains, C C, in connection with the crank and shaft are used to bind the load and also in connection with the ropes and hooks connecting the two hind pairs of stakes to move backward the forward pair, and forward the hind pair, which motion raises all the rollers from the frame and discharges the load, leaving it in a compact pile and without breakage or damage to lumber.

Machine for Spreading Cement on Flexible Fabrics.

The machines shown in section by the engravings are intended for spreading a coating of cement on the surface of textile fabrics, cloth, canvas, paper, etc., for roofing and other purposes. Fig. 1 is a vertical transverse section of the spreading machine as operated by a rotary movement and intended to be used for factory work. Fig. 2 is a section of the spreading machine as operated by a horizontal movement and intended to be used to spread the cement directly on the roofs, etc. In Fig. 1, A represents the main frame which supports a detachable hopper, B, held to the frame by hooks. The side, C, of the hopper is pivoted to it at D, and thus serves as a gate to regulate the flow of cement or composition from the hopper. To the inner side of this gate, C, is attached a metallic plate termed the trowel, which is adjustable to or from the fabric by the screw, E. F is a large drum or cylinder, around which the fabric is passed, to be carried under the trowel. This fabric is held close to the drum by the pressure roller, G, operated by a spring. On the opposite side is the roller, H, which receives the prepared canvas from the drum and delivers it to an endless carrier or a table of a desired length. The thickness of the coating can be regulated by simply screwing up or unslacking the set screw, E, and it will be seen that as the fabric passes around the drum the convex surface of the latter expands the cloth so as to open the interstices, thereby permitting the cement to penetrate and adhere more tenaciously to the fabric. On this rotary machine, if driven only by hand, from 10,000 to 15,000 feet of canvas can be spread in a day, and this is intended for the use of factories where the roofing canvas is prepared in large quantities.

But where a machine is wanted to be used on roofs, etc., to spread the cement on the fabric *in situ*, then the arrangement as represented in Fig. 2 is applicable, in which the hopper instead of being stationary, as in Fig. 1, is caused to advance over the fixed fabric by means of the rope and windlass, I. The hopper is confined to a rectilinear path by the cleat, J, which enters a longitudinal groove, the fabric being kept straight by a pressure roller, K, while the trowel is secured by the wedges, L, and the canvas is prevented from moving by the bar, M, whose ends are secured in the groove. This machine can be used on roofs or other places where cement-spread canvas is needed, and can do more and better work than twenty or thirty hands. Patented Sept. 4, 1866. For further information address J. H. Pulte, No. 293 Walnut street, Cincinnati, Ohio.

Fig. 2.

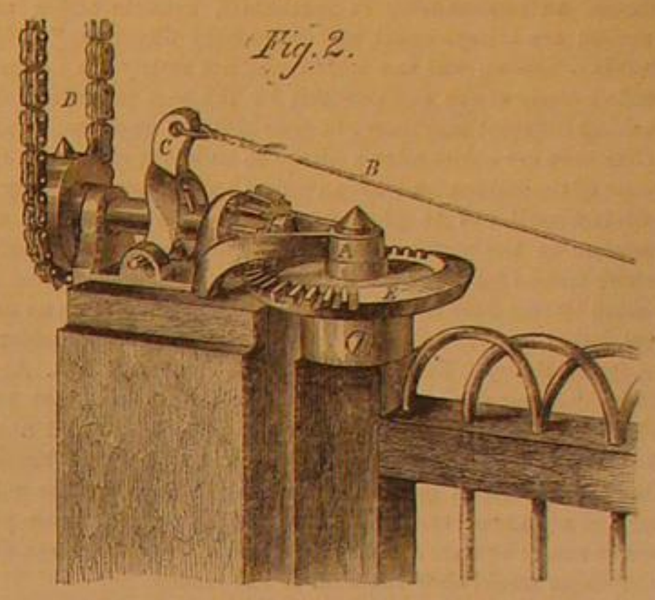
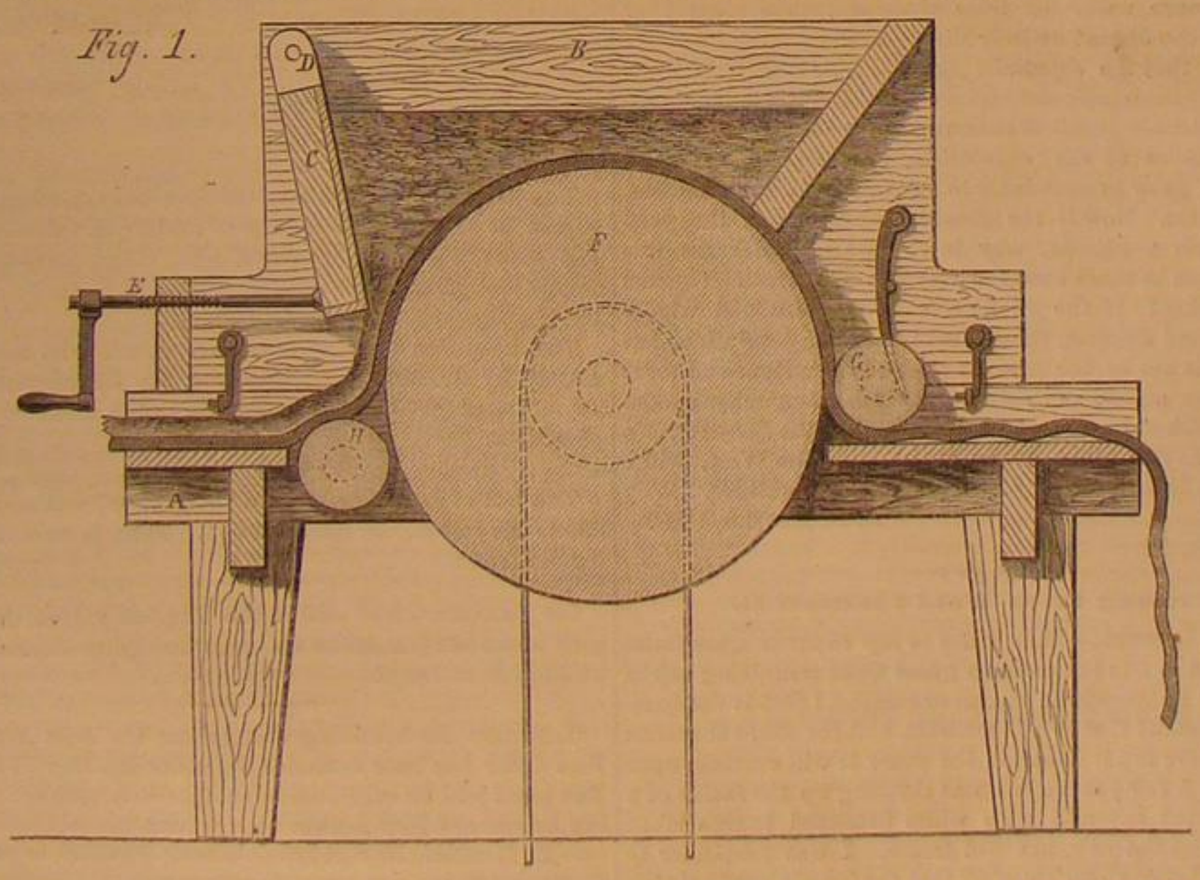


Fig. 1.



PULTE'S CEMENT-SPREADING MACHINE.

Bath for Tempering Steel.

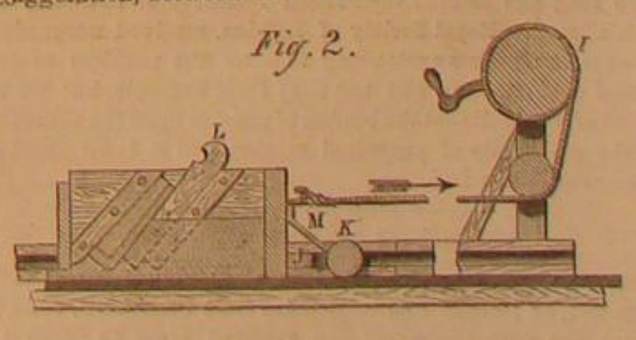
G. J., of Me., a practical forger, sends the following recipe for a bath for tempering steel: Water, 1 gal.; spirits of niter, 1 oz.; salammoniac, 1 oz.; white vitriol, 1 oz.; alum, 2 oz.; table salt, 8 oz.; saltpeter, 1 oz.; lard oil, 1 pint.

Mill picks should be heated a dark cherry and cooled quickly in the bath. Taps and dies heated to cherry red and drawn to light blue; wood tools drawn to copper color. Springs should be heated to a dark (black) red and drawn to dark blue. Marble engraving chisels, to a light yellow. Cutlery, however thin the blades, may be tempered at one heat without springing or fire cracking.

Petroleum in the U. S. Navy.

We see it loosely stated that petroleum is now in successful experimental use on board the U. S. steamer *Palos*, where it has been demonstrated that it will do the work of the best anthracite coal with about one sixth of its weight and bulk and less than its cost. Professor McGauley, on the other extreme, calculates the heating power of petroleum as nearly one and a half times that of English coals, by weight, reckoning from the constituents of each. The London *Standard* has asserted that it will raise three times as much steam as can be raised with coal. Mr. Richardson's experiments, probably the most trustworthy yet made, have shown with imperfect combustion in an ill-adapted boiler, a little over twice the effect of coal. There is a good deal of confusion, and some exaggeration, between the extremes. The theoretical conclusions of Professor McGauley, however, seem hardly of any practical worth, although upon them he founds what he considers a demonstration, that deducting the difference against petroleum in bulk, which he makes 26 per cent, from the difference in its favor by weight, which he sets at 38 per cent, there is only 12 per cent advantage, to offset the heavy disadvantage in cost. Actual experiment alone can show what each fuel is capable of doing in its peculiar conditions and by our modes of combustion. We shall look with interest for more precise and authentic information from our navy. It is in this country that petroleum can be used to advantage if anywhere, and here if anywhere the ingenuity will be found to use it to the best advantage.

Fig. 2.



THE Chicago Egg Preserving Co., with a capital stock of $50,000, have signed articles of association.

Correspondence.

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

Perpetual Motion.

Messrs. Editors:—From time to time many scathing articles have appeared in your Scientific American on the subject of "Perpetual Motion," the last which has come to my notice being in No. 16, Vol. 16, date April 20th under the head of "A Terrible Invention." You have always persistently endeavored to convey to the minds of the readers of your valuable paper that perpetual motion is an impossibility. Now I would ask you, have you ever seriously considered the principles involved toward the working of such a machine, or have you ever tried to invent or discover the means by which a machine should start itself, and create within itself a power to sustain itself in motion until the machine itself, or some of its parts be worn out? If you have, why not give your experience to the world? But if you base your opinion upon the verdict which others who have tried it and failed have given, without examining for yourself, I think the least you say about it the better. Works on "Natural Philosophy" generally give their opinion thus: "Perpetual motion is deemed an impossibility in mechanics, because action and reaction are always equal, and in contrary directions." Now here is a reason, but one which will not satisfy me. I have made a study of the same subject for the past thirteen years, making different machines but none hitherto would work, and it has been my object after a failure to endeavor to find out the cause of the failure, and by pursuing this course, not only to satisfy myself, but to give, after my experiments, my experience to the world. I am now constructing a machine which will be my last; for if the one now being made and invented by me does not work, I shall then give it up as useless, but still, until I prove tothe contrary, I cannot consider it an impossibility. You say, page 253 of current Vol. April 20th. "A machine generating force in excess of that provided to impel it, if such a thing were possible, could never be stopped by the power that started it, and would become like the wonderful self-acting cork leg in the song, the master and not the servant of its maker." Now, gentlemen, you are in error; remove the firm cause, the compressed air, and the whole would obey the will of the master.

You have said time after time that it is an impossibility. Give me, give the world through your paper, your reasons scientific or otherwise, why the feat cannot be performed. I am in quest of light on the subject and wish if possib e to clear away the mist that envelops the minds of many of my fellow men. W. J. A.

Philadelphia, Pa.

[We publish our correspondent's letter as one more evidence of the hallucination of strivers after a mechanical impossibility. Evidently he is a man of culture, an independent thinker, and probably is as conversant with the laws of mechanics as we; but nothing will serve him but a demonstration, and hardly that; for according to his own statement he has made several machines during thirteen years of study and experiment, and is preparing another. Neither the well-established and immutable laws of nature, the innumerable failures of others, nor even his own disapointments have sufficed for him.

Of what avail would be the recital of our failures in the discovery of a perpetual motion, if we had ever made the attempt? Of what avail to re-state reasons which for two thousand years have withstood all attempts to controvert them? Shall we enter into an argument to prove the earth to be the center of the solar system, or that the attraction of gravitation exerts its force from center to circumference?

When our correspondent can totally annihilate friction, overcome at will gravitation, prevent the adhesion of parts, and preclude the conversion of some of the mechanical force exerted into heat; when he can add to the force generated or transmitted through any part, or make a machine yield more work than the amount of the power applied, and when he can gain velocity except at the expense of power, it will be time enough for us to fill our columns with speculations on an impossibility.

So long ago as 1775 the French Academy of Sciences, and soon after the Royal Society of London, resolved never more to examine papers pretending to solve the problem of perpetual motion. We will not copy their example, but we respectively submit that the burden of proof is upon the advocates of the possibility of perpetual motion, and it is for them to demonstrate the fact.

Rupture of Hollow Cylinders.

Messrs. Editors:—I noticed in your issue of March 30th, page 201, an item of correspondence from Cincinnati, Ohio, in which the writer says:—"The received error to rupture a cylindrical boiler by internal pressure," which is "as the pressure on a space equal to the diameter instead of the semi-circumference," has been previously noticed by him in the Scientific American, but in the article in question presents a clearer view of the opposing theories.

He further declares in substance, that "by the irrefutable law of statics, the force to rend asunder" a side of a cylinder is equal to the total normal internal pressure upon a quarter circumference. In many cases in statics, resolved forces (which our correspondent has lost sight of for the moment, although evidently posted in the principles of statics) are considered as well as the primary forces from which they are resolved. This one fact I think will lead him out of his difficulties and save him the trouble of further diverting from the truth the minds of your readers.

"By the irrefutable law of statics" the energy to tear asunder the side of a cylinder subjected to internal pressure is not equal to the total normal pressure upon a quarter circumference, but it is equal to the sum of all the elements of normal pressure acting on a quarter circumference resolved in the direction of the rupturing force considered, acting at one extremity of the quarter circumference. This will be found equal to the pressure upon a space equal to the radius, of the same length as the cylinder.

In the second volume of the Journal of the Franklin Institute for 1863, under "Suspension Bridges—A New System," I gave the substance and proof of the following theorem:—"The tension upon a normally pressed arc is uniform throughout, and equal to the pressure at any point of the arc multiplied by its radius of curvature."

An arc of the cylinder of any breadth being a normally pressed arc, it follows from the above theorem, proved independently of the question at issue, that the tension or force of rupture at any point is equal to the pressure multiplied by a radius, or what is the same thing the pressure on a space equal to the radius.

Be it sufficient at present to simply further state that all the great authors on mechanical engineering, such as Fredgold, Professor Rankine, etc., are willing to accept and abide by the results of the "irrefutable law of statics" when correctly applied, even when the result follows from general principles established independent of the problem. S. W. Robinson.

University of Michigan.

Milk Sickness.

Messrs. Editors:—In looking over the Scientific American, April 27, 1867, I find an article headed "Milk Sickness." As this question is now agitating the minds of the people living in the affected districts, it would not be amiss in me to say a few words in regard to the cause of the much dreaded malady. My observation and experience upon this singular malady reach back as far as 1856, and during this time I had frequent opportunities of studying its locality, origin, symptoms, treatment and anatomical characters. I, for one, will be greatly indebted if they prove satisfactorily that the *Eupatorium Ageratoidis* is the *fons etorigo* of this disease. And here let me ask, why should we endeavor to limit the cause of this disease to one single agent? In addition to the plant already mentioned, I have used the *rhus toxicodendron* (poison oak), and *rhus vernix* (swamp sumach), upon animals with the same effect, producing symptoms precisely alike. The majority of physicians concur in the opinion that it is a vegetable poison, but no satisfactory account of its nature has ever been given. Some say that it is an ergotized grass, or the combination of vegetables, forming a chemical change within themselves. Others claim that the *rhus toxicodendron, rhus radicans, rhus vernix, champignon* and even the harmless *caltha palustris*, are the sole cause of the disease. Every one who has lived in the milk-sick range, knows that the poison exists in circumscribed districts. These locations may contain one or hundreds of acres. It is found upon the hills, of soil of an inferior quality, and upon the richest vegetable mold of river or creek bottoms. These isolated locations, which produce the milk sickness, are generally well timbered, although I have seen these affected districts on open prairie. One fact is clearly known: where these localities were once noted for their virulency, when cleared or cultivated the disease entirely disappears.

To say that the *eupatorim ageratoidis* is the only vegetable that causes milk sickness would undoubtedly be an expression without practical observation for its basis. The different varieties of the *eupatorium*, and especially the *E. ageratoidis*, grow in abundance in Pennsylvania, Iowa, Kansas, Nebraska, etc. Now if the disease depends upon the presence of this vegetable, why is it that milk sickness was never known in these states where the *E. ageratoidis* grows in abundance? If the *E. ageratoidis* was confined wholly to the affected districts, the evidence would be conclusive: but we find this not be the case: it grows in abundance all over the western states, and cattle graze with impunity amidst it. The milk sickness could not be owing to the *E. ageratoidis*, inasmuch as this plant grows throughout the West, while the disease is perseveringly limited to certain localities. Why is this? H. M. Keyser, M. D.

Momence, Ill.

Freezing Green Wood Contracts It.

Messrs. Editors:—That water or sap expands upon freezing is plain to all: but freezing green wood containing sap in its natural state—will it expand or contract? that is the question. I contend that it will contract, and the softer the wood and the more sap it contains the more it will contract upon freezing. A few years ago I was sheeting up the inside of a newly erected saw-mill with white basswood boards taken directly from the saw, but not frozen. I was particular to make the joints close, knowing that the boards would shrink on seasoning. In the evening following the weather changed to severe cold, and on going out to my work in the morning judge of my surprise at seeing cracks that I could put my fingers through, where only the evening previous were close joints. When water from the falling rain becomes lodged in the cavities of standing trees, let the quantity be ever so small, upon freezing it is apt to burst the timber, and upon thawing out, the water will work its way down, then freeze and expand again. In this way I have seen trees that had split from top to bottom, but do not think that I ever saw a tree that had burst from freezing the sap as it naturally exists in the wood. If such a thing were possible it would be next to impossible for timber to grow in cold climates. I should like to hear from others upon the subject. D. Millard.

Leonidas, Mich.

[The drying effect of a freeze in porous fabrics, so well known to every housewife, should be taken into account in this connection.—Eds

Editorial Summary.

Maine Silver Lodes.—A letter from Bangor, which reads like exaggeration but professes the most sober information, states that five parallel lodes of argentiferous galena, some parts producing 25 to 33 per cent of copper, have been opened near Foxcroft, to a length of about fifty feet and a depth of about twenty-five feet, with increasing thickness as they descend. Assays show the ore to contain $230 to $350 worth of silver to the tun. An equally high story is told of the Guilford ore. Undoubtedly culled specimens were assayed, if there is foundation of any kind for the statement.

Pacific Railroad Ties.—The Union Pacific Railroad, by way of Omaha westward, passing through a country very deficient in wood and water, has thus far had to be laid upon cottonwood ties or sleepers. To fit this soft wood for the service required, it has been necessary to treat the ties with a solution of zinc, in a vacuum by which the pores were first emptied of their natural contents. The zinc, penetrating the pores, is said to give the wood almost a metallic appearance and weight, and secures its durability.

Peat Illuminating Gas.—At the Glenn's Falls Gas Works, Troy, N. Y., the experiment has been made of substituting peat taken from a bed about three feet below the surface, for coal, with the following satisfactory results. One hundred and fifteen pounds of dried peat yielded 78 feet of gas, or 5·81 feet of gas to the pound, while the best coal makes not more than 4·41 to the pound, the price of the peat being much less per tun than that usually employed in the gas manufacture.

The Growing Sugar Product of the Sandwich Islands gives considerable employment to machinists. The Honolulu *Commercial Advertiser* describes the eleventh sugar mill turned out within a short time at the works in that city, as a massive piece of workmanship which in the opinion of good judges could not be excelled in any of the machine shops of the old world. The rollers weigh 6000 lbs. each Three more of these machines are building at the same works.

Recreations of a Philosopher.—Professor Doremus once placed a linen handkerchief in the explosive condition of gun cotton, and threw it into the wash. Bridget washed, dried, and sprinkled it ready for ironing, without a suspicion of its character. The moment she placed the hot iron upon it, the handkerchief vanished into thin air, nearly frightening the poor girl out of her senses. Had this occurred an age ago, the professor would have passed for a "limb of Satan."

Water-Proof Packing Paper.—The following is a German recipe: Dissolve 680·4 grammes (about 1·82 lbs.) of white soap in a quart of water. In another quart of water dissolve 1·82 oz. troy of gum arabic, and 5·5 oz. glue. Mix the two solutions, warn them, and soak the paper in the liquid. Pass it between rollers, or simply hang it up to drip, and then only at a gentle temperature.

Orders have been received at the Springfield Armory for a large and immediate increase in the production of breech-loaders of the latest model. The force of workmen is to be greatly enlarged, and the old muskets are to be remodeled at the rate of 500 or 600 per day.

The English trade in coal-tar dyes is expanding, and we import of them a half million of dollars, in value annually. The colors, which are magenta, blue, violet, purple, yellow, orange and green, are beautiful.

The mastodon remains, from Cohoes, are to be mounted at Albany by Mr. Gilbert, of Rochester, the Legislature having appropriated $2,000 for that purpose and to make further explorations.

The fact of next year being a "leap year" has added £13,000 to the cost of the British army. That is one day's pay for the forces.

Sic Transit.—It is said in the English papers that a Belgian house has just taken an order for eighty locomotives for an English railway!

The time for receiving designs for the New York Park Post Office has been extended from the 8th May to June 1st. The plans will be exhibited in public.——A plan for connecting Boston and East Boston with an iron tunnel is canvassed. ——At Herndon, Nev., a hotel to cost $100,000 is proposed. Cincinnati is to erect a marble monument to Lincoln.——Sir Robert Smike, one of the most noted British architects, is dead, aged 87.——Parties in Albany have purchased, at the head of State street, for $147,000, land on which they will erect a $750,000 six-story marble-front hotel and opera house combined. The new hotel will contain more rooms than any hotel in America.——A wrecking firm of Norfolk, Va., have commenced preparations for raising the hulks of the two seventy-four gun ships *Delaware* and *Columbus*, which were sunk by the rebels at the Gosport navy yard in 1861.——The French Exhibition building has been sold to a Russian company, who are to take possession Nov. 1st, and re-erect the same at St. Petersburg.——It is proposed to build the new State Capitol, at Albany, of a handsome light-colored granite, to be had cheap in Saratoga County.——The new banking building of the New York Park Bank, Broadway, is to have a kitchen underneath for providing mid-day meals to its employés.——It is said that George Pebody sawed wood for a night's lodging at Concord, N. H., fifty years ago.

Recent American and Foreign Patents.

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

PISTON-PACKING RING.—Charles H. Clark, Wilmington, Del.—The object of this invention is to provide a self-adjusting packing for the pistons of steam engines by which the pressure around the cylinder shall be equalized and the piston maintain a central position without undue pressure on the rubbing surfaces.

HOLLOW AUGER.—George E. Booth, Seymour, Conn.—This invention consists in a device by which the tenons of the spokes for wagon wheels and tenons for other purposes may be accurately and expeditiously made by revolving an auger in a lathe or by a hand brace, the main feature of the invention being in the manner in which the cutters are constructed and adjusted.

HOT-AIR FURNACE.—J. A. Vanburen, South Troy, N. Y.—This invention relates to the manner in which the heat-radiating surface of a hot-air furnace is increased so as to utilize the fuel and properly distribute the heated air.

JOINT FOR STOVEPIPE.—O. M. Pillsbury, Claremont, N. H., and D. L. Milliken, Brattleboro, Vt.—This invention relates to a new and improved manner of securing together the sections or lengths of stovepipe whereby a stovepipe may be readily put up and taken down and the sections or lengths firmly connected together, very close or tight joints being obtained which will effectually prevent the escape through them of either smoke or fire.

MACHINE FOR MAKING NUTS AND WASHERS.—Andrew Emerson, New York City.—This invention relates to a new and improved machine for making nuts and washers, and has for its object the forming of the same with angular or sharp edges and with smooth surfaces or sides so as to have a finished and neat appearance. The chief difficulty attending the manufacture of nuts by machinery is the giving to them a smooth finished exterior and sharp angular corners. Heretofore there has always been a rough surface and the corners rounded in a greater or less degree, a result fully obviated by this invention.

CULTIVATOR.—Edmund H. Knight, Unadilla, Mich.—This invention relates to a new and improved cultivator for general purposes but more particularly adapted for cultivating crops grown in hills or drills. The object of the invention is to obtain a device for the purpose specified which may be manipulated with the greatest facility by the rider and driver and which will admit of the shovels or teeth rising when meeting with obstructions so that they may readily pass over the same and thereby avoid any parts of the machine being broken or injured thereby.

CULTIVATOR.—J. H. Allison, Eureka, Ill.—This invention relates to a new and improved device for cultivating young corn and other crops grown in hills or drills, and also for harrowing in small seeds.

POST-DRIVING MACHINE.—C. T. Fitch, Harbor Creek, Pa.—This invention has for its object to furnish a cheap and convenient machine for driving fence and other posts.

ATMOSPHERIC RAILROAD—A. H. Caryl, Groton, Mass.—This invention relates to a new and improved means for propelling railroad cars through the medium of compressed air, and is designed for city or street railroads, and to supersede draft animals or horse power now employed for such purpose.

JOINT FOR CHIMNEYS.—Marvin H. Kelsey, Red Bank, N. J.—This invention relates to a new and improved joint to be applied to chimneys where they pass through the roof of a building in order to prevent leakage between the chimney and roof. The object of the invention is to obtain a simple and economical device which may be readily applied and which will effectually prevent leakage around the chimneys, whether the roof be of shingles, slate, tin, composition or other material.

CHURN POWER.—John Christley, Slippery Rock, Pa.—This invention consists in the combination with a walking beam of a treadle the latter being connected to the former by a pendulous arm so that reciprocating motion can be imparted to the dasher rod which is attached to one end of the walking beam either by moving the opposite end of the beam up and down, or by operating the treadle, or by directly revolving the horizontal driving shaft by means of a crank or pulleys or otherwise.

HORSE-SHOE.—C. Weltman, Hazelton, Iowa.—This invention relates to a new and improved manner of securing calks to the shoe whereby the former may be readily secured to and detached from the latter and new calks therefore applied whenever required, without detaching the shoe from the hoof.

CARRIAGE CLIP OR THILL COUPLING.—Edwin R. Powell, Cambridge, Vt.—This invention has for its object to furnish an improved thill coupling so constructed and arranged that the thills or pole may be shifted easily and quickly, and which will at the same time be perfectly secure and free from rattling.

RAILROAD-TRACK CLEARER.—Watson King, Springfield, Ill.—This invention has for its object to so improve the construction of cars for running upon horse and other railroads that the cars may clear and clean the track for themselves by removing obstructions and thereby preserving life by rendering it impossible for any one who may have accidentally fallen upon the track to be run over by the wheels of the car.

SPRING JACK AND COUPLING FOR WHEEL CARRIAGES.—Thomas De Witt, Detroit, Michigan.—This invention has for its object to furnish an improvement in the construction of the jack or supporting springs which connect the half elliptic springs of a carriage to the axle.

MACHINE FOR FORMING BOILERS FOR COOKING STOVES.—Elisha S. Sackett, Monroe, Wis.—This invention has for its object to furnish an improved apparatus by means of which the bodies of sheet metal boilers for cooking stoves may be formed conveniently and accurately.

TOBACCO CUTTING MACHINE.—J. W. Crossley, Bridgeport, Conn.—This invention relates to a new and improved machine for cutting tobacco for chewing and smoking purposes. The invention consists in a novel manner of arranging and operating a knife whereby a drawing cut is obtained, and also in a novel feed mechanism for feeding the tobacco to the knife, all being constructed and arranged in such a manner that tobacco may be cut for the purposes specified with a moderate expenditure of power, in an expeditious manner, and finer or coarser as may be required.

CHURN.—Stephen Ballard, Sen., Sullivan, Ind.—This invention has for its object to furnish an improved churn by means of which the churning may be done very rapidly and thoroughly.

MEDICAL COMPOUND.—Dr. James A. Willis, Cherry Valley, N. Y.—This compound is intended for the removing and curing of bony substances in horses, such as ringbones, spasms, splints, etc.

ORGAN PIPE.—E. B. Andrews, Osborn Hollow, N. Y.—The object of this invention is to so construct the pipe that its tone cannot divide from one key to another, whether the pressure upon the bellows be more or less.

MOP HEAD.—John A. Wilson, Spencer, Mass.—This invention consists of a head or holder for a mop, provided with rollers suitable for wringing the same, when the mop is so hung to the head that at such times as is desired it can be drawn around and between the wringing rollers, without touching it with the hands.

WATER HEATER FOR STEAM ENGINES.—Peter M. Kafer and Joseph M. DeLacy, Trenton, New Jersey.—The object of this invention is to facilitate the extinguishin gof fires in cities and towns by supplying the steam fire engine boiler with water already heated to near the boiling temperature before it is started from the engine house.

WINDOW FASTENING.—Philip Verbeck, Neenah, Wis.—This invention relates to a new and improved fastening to be applied to the sashes of windows for the purpose of securing the same at any desired point within the scope of their movement, securing them when closed and preventing them from being either raised or lowered when secured in a partially raised or open state.

STEAM CONFECTION PAN.—G. H. Cross, Montpelier Vt.—This invention consists in arranging a funnel-shaped pan with a false bottom, in a suitable frame the shaft (or what would be the neck of the funnel) stands in the frame at an angle about 45°. The lower portion of the pan forms a steam chamber, and the funnel is revolved over a fire by suitable gearing.

ROOFING.—Seymour Pratt, Fayetteville, N. Y.—This invention consists in constructing a roofing of hydraulic cement mixed with lime and sand, this composition being pressed into square or other proper shaped blocks or tiles and laid, when in a set or dried state upon boards or lath nailed to the rafters. The cement blocks or tiles are, when laid upon the boards or laths, cemented together by and laid upon the same material in a plastic state as the blocks or tiles are made of.

SPIKE HOLDER.—Edwin W. H. Cooper, Hartford, Conn.—This invention consists in the arrangement of a truncated wedge in combination with a socket intended to receive the spike, and formed of two clamping jaws in such a manner that by the action of said wedge and clamping jaws the spike can be firmly retained in position, and all the disadvantages are obviated which arise if the spike works loose and if said spike has to be drivep into different holes in the sleeper. With the clamping jaws and the wedge a suitable shell and an additional strip of wood or other material are combined, for the purpose of securing the spike holder conveniently and securely in the sleeper or crosstie.

DRY HOUSE.—Judson Schultz, Ellenville, N. Y.—This invention has for its object to furnish an improved dry house so constructed and arranged that substances to be dried of different degrees of moisture may be kept separate, and so that each separate portion may be supplied with more or less heat and air as may be desired.

INTERFERING AND OVER-REACHING ATTACHMENT FOR HORSES.—Frank B. Doughty, New York City.—By this attachment, the interfering and over-reaching of horses can be entirely prevented and permanently cured.

KNITTING MACHINE.—Mark L. Roberts, Chatsworth, Ill.—This invention consists principally in a novel manner of operating the thrower for needles. Also in so arranging the needle operator that its length of stroke can be adjusted and changed at pleasure.

STOVE.—Jonathan H. Green, Christainsburgh, Iowa.—This invention has for its object to furnish an improved stove so constructed and arranged that while answering all the ordinary purposes of a stove, it may have the additional advantage of being convenient for warming the feet when cold.

HARVESTER.—David Wolf, Lebanon, Pa.—This invention relates to a harvester which consists in a novel construction of the platform, whereby the cut grain may be readily discharged therefrom and kept free from the sickle as it is cut. The invention also consists in a novel means for discharging the cut grain from the platform and also in the means for connecting the platform with the main frame of the device, and in an improved ratchet and pawl arrangement for the driving shaft, also constructed and arranged that several advantages are obtained.

BLIND SLAT FASTENING.—F. R. Smith, Bennington, Vt.—This invention relates to a fastening to be applied to a window blind to hold the slats in a closed or partially closed state, and prevent them when closed, from being opened on the outer side of the blinds when the latter are shut.

FIRE ESCAPE.—Alfred Rigney, New York City.—This invention relates to a fire escape, which is held in a carriage, and can be transported to any desired place, like a fireman's ladder. It consists mainly of a flexible ladder, the side pieces of which are made in sections, hinged together one round being in each section. The ladder can thus be easily wound around a horizontal drum or shaft, contained in the aforesaid carriage. On the hinged side-bars between the rounds, are arranged slides which fit close around the side bars, so as to remain in any position in which they may be placed.

HOT AIR FURNACE.—E. H. Camp, Jackson, Mich.—This invention relates to the manner in which the heat radiating surface of the furnace is increased, and to the manner in which the products of combustion are made to return through the fire box in a flue.

GAS BURNER AND HEATER.—H. Y. Lazear, New York City.—This invention relates to certain improvements in the construction of gas burners for cooking and heating purposes, so that the flame can be thrown toward one common center, thereby intensifying the heat, which construction also allows of the introduction of an air tube for heating purposes, the flame surrounding the said tube and heating the air which passes through the same.

POWER HAMMER.—Thos. F. Preston, Pawtucket, R. I.—The object of this invention is to construct a power hammer in such a manner that the hammer will not flap about loosely, but that its motion will be perfectly steady, and that no shock will be communicated to the working parts above.

BEER AND MASH COOLER.—C. Wise and B. Loeffler, New York City.—This invention relates to an apparatus for cooling the works in the manufacture of beer, but may be used with advantage in all kinds of distilleries and for other purposes. It consists in the use of a circular horizontal vessel, into which the heated mash is poured. In the center of the vessel a vertical shaft is arranged, which receives rotary motion from a belt or otherwise, and on which a number of wings are attached, in such a manner that by the same the vapors which ascend from the liquor are thrown aside and fresh air brought into their place, so as to rapidly cool the liquor in the vessel. The liquor itself is kept in motion by a set of stirrers, arranged on the revolving shaft, and by chains attached thereto, which prevent the settling of any residue and help to rapidly cool the liquor. The fan as well as the stirrer are arranged adjustable on the aforesaid shaft.

PAPER BAG MACHINE.—Gustav L. Jaeger, New York City.—This invention consists in the arrangement of a movable former made of tin or other suitable material, in combination with two or more movable flaps or wings, which turn the blank over the former in such a manner that by the former itself the blank is held in position, and a triangular or square paper bag can be made with little trouble and expense.

SPLICING, BURRING, BURNISHING, AND BLUEING STEEL SPRINGS.—A. B. Doolittle, Hartford, Conn.—This invention relates to a machine which is intended to burr and burnish steel springs after the same have been hardened and tempered, and to blue them when burnished, all in one operation. To prevent the rivets which are used in splicing the springs from injuring the burnishing rollers, the ends of said springs are struck up so that the heads of the rivets are not allowed to come in contact with the burnishing surfaces.

BALANCED SLIDE VALVE.—Alfred Hobbs, West Cambridge, Mass.—This invention consists in forming the valve and valve seat of a steam engine in a semicircular form, whereby the downward pressure on the same is neutralized.

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 50 cents a line, under the head of "Business and Personal."

W. A. T., of Kansas.—"Will it injure a rifle to fire shot from it?" Yes. The shot passes straight through the barrel and consequently across the edges of the rifling. Remember that a soft metal in rapid motion will wear away the hardest iron. You can saw a file in two by a disk of copper or lead revolved in a lathe.

W. E. G., of Pa.—Flour paste, well boiled alone or mixed with glue will serve the purpose of repairing the bellows of your melodeon.

J. J., of N. Y., made an induction coil for giving shocks which operated well at first, but soon lost all its power. Probably by rough handling it has lost its insulation, or the connections with the battery are imperfectly or wrongly made.

S. L., of Ohio.—The effect of magnesium with other metals is to render the alloy brittle. We are not aware that any alloy of magnesium has yet been made which is likely to prove valuable in the arts.

H. C., of Pa.—A good coach varnish or drying oil thinned with turpentine will be good to restore the luster of the iron work of your fireplace which has been dulled by the heat. . . . The yellow stains on the margin of engravings may be removed by a solution of hypochlorite of soda, commonly called Labarraque's solution.

P. C. M., of N. Y., plays the violin and finds that his hands perspire so much that the strings are soon worn out and the instrument is continually getting out of tune. There is probably no treatment of the strings which would satisfactorily answer his purpose. Any foreign matter put on the strings to render them perspiration proof might be a remedy worse than the disease. We suggest that he try finger stalls made of very thin india-rubber.

M. L. M., of N. Y.—You can extract the silver from old watch cases and similar alloys by dissolving in nitric acid, and precipitating chloride of silver with a solution of salt. The silver is reduced in a pure state by mixing the chloride with an equal weight of bi-carbonate of soda and smelting in a common sand crucible. . . . Napier's electro-metallurgy is a practical treatise. We are not acquainted with any book in English which treats especially of watch repairing or engraving.

A. M., of Pa.—We have seen speaking tubes several hundred feet long. A conversation without doubt might be carried on through a properly proportioned tube a mile or more long.

A. W. G., of Ohio.—The best conductors of heat are also the best conductors of electricity. There is no metal or other substance which at the same time is a conductor of the one and a non-conductor of the other. . . The substances which absorb heat most rapidly are the best radiators. The heating and cooling of any body take place in equal times.

W. B., of Pa.—"Will a one inch water-tight pipe, issuing from a head of 100 feet above the level of the sea, deliver water at the sea, when the pipe is carried over a hill, the top of which is 150 feet above the sea?" The pipe cannot carry the water on the principle of the siphon, for the siphon depends upon the pressure of the atmosphere which lifts water only thirty-four feet. In the case proposed the water is to be lifted 50 feet. Resort must be had to a force pump.

C. A. H., of N. J.—In the recipe to which you refer, for the word, parts' read 'pounds' and you will understand it.

D. W. S., of Mo.—In reply to your question relative to menhaden oil we reply that it is manufactured by C. F. and J. B. Heneshoff, Bristol, R. I.

O. J. P., of C. E., asks if two cylinder engines do better work for a steamboat than a single cylinder of the same capacity as the two united. If the steamboat is driven by a screw two cylinders are required, if by paddle wheels one is sufficient and if of equal power is in our opinion, preferable on all accounts. The "dead points" you speak of are of no account in a paddle engine; the wheels act as fly wheels.

W. L. B., of Pa.—"If a water wheel be set in motion by water and is made of imperishable material would it be what we understand by perpetual motion?" No. Perpetual motion, as understood by scientists and mechanicians, is not simply a continual movement but an imaginary machine which produces its own power. Perpetual motion is really a perpetual humbug deluding and ruining its votaries.

J. T. H., of Mass., asks whether the inventor of the "new dryer for raw oils" mentioned in No. 17 current Vol., desires to keep it secret or to sell. He advises him to advertise it. We do not know who the inventor is nor what he intends to do with his discovery. Perhaps the correspondent, A. W., who gave the statement can reply to J. T. H. and others who have requested the same information.

S. M. B., of Tenn.—We suppose the use of sand in taking a welding heat on iron is to preserve the outside from being burned before the interior portion is of the proper temperature. As a flux it also preserves the surface from slag the presence of which would prevent securing a thorough joint.

B. F. J., of Wis.—Iron and some other metals permanently expand by heat; at least they are expanded while hot. Probably the grate bars in your furnace were fitted when cold to touch the back and front. It would not be surprising, therefore, that they should bulge out your furnace front. You should allow at least an inch for expansion in grate bars of three feet.

H. C D., of N. Y., asks what are the component parts of a solder a very little harder than tinman's soft solder, something that will melt and flow by the blaze of a spirit lamp. Tinman's solder is lead, 1, tin 1. Probably the addition of a small proportion of antimony would increase the hardness and yet leave it fusible enough. Perhaps some of our correspondents can give a recipe.

F. L. C., of Md.—Cucumbers, cellery and lettuce contain oils which may be extracted by a solvent. The yield however would be small.

A. S., of N. Y.—"Jones' lamentable squeak (see page 298), can be stopped by putting a peg in the middle of the sole of his boot."

G. W. S., of Pa., argues thus: Steam is lighter than air, rises in the air and buoys up whatever contains it, consequently by reason of this lightness of steam, the pressure on the upper side of the boiler is greater than on the lower. The reasoning is fallacious. What makes steam rise in air is the upward pressure of the air. In a closed rigid vessel like a boiler, there is no pressure of the air and a tendency of the steam upward on that account. The weight of the steam moreover is an addition to the pressure on the bottom of the boiler.

R. B., of N. J.—Mr. Ansell the inventor of the fire damp indicator lives in England. A letter addressed to him at London, care of Wm. Crookes, Esq., will reach its destination.

A. J. B., of N. J.—A non-drying cement of great tenacity, useful in fastening together plates of glass so as to exclude the air, but which may be easily separated, is formed by adding fresh slacked lime to double its weight of india-rubber, heating to about 400 deg. F. when the rubber will be converted into a glutinous mass. A drying cement is made by mixing equal weights of such gum, lime, and red lead.

A. A. C., of N. Y.—The diapason, or tuning fork, as it produces at will an invariable note, is used for regulating the sounds of musical instruments, and also furnishes a standard for the musical scale. The tone denoted by the letter, A, is produced by 428 vibrations of air per second. Piano fortes are generally tuned below concert pitch, A3, corresponding to 420 sound waves per second.

E. N. G., of Tenn.—The dimensions of the Albany boat, the *St. John* are; length 417 feet, width over all 80 feet, beam 30 feet. The engines are 82 inch cylinders and 15 feet stroke. Estimated horse power over 1800. She has accommodations for 700 passengers, is registered as 2,525 tuns burden, draws from six to six and one-half feet of water, and her speed is from 15 to 17 miles per hour. The *Mary Powell* averages 20 miles an hour, and on several occasions has made 27 miles. If the Mississippi steamboat makes 12 miles against a current of 3 miles per hour, if running down stream with the current in her favor, she would make 28 miles with the expenditure of the same amount of power.

W. S. H. Jr., of Pa.—We must receive indisputable proof that the Nicolson pavement is injurious to horses from its "rebound" before we shall believe it. We think the unyielding rigidity of stone pavements is one of its serious objections. We do not regard the Nicolson pavement as "essentially the same as a plank road," as in the latter case the grain of the wood is horizontal, the best position for springing, and in the former the grain is vertical, the proper position to secure firmness.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Wanted—location for Portable Saw Mill—steady sawing, from one to five years. Address Marion Lumber Company, Midway, Washington county, Pa.

Wanted to correspond with some person having a second-hand portable steam engine to sell, not less than 8 or 10 horse-power. Direct J. E., Rockwood, Ill.

C. J. Fay, Camden, N. J., wishes the address of all paper manufacturers, so as to correspond with them.

Device for Burning Coal Dust.

The question of economy in fuel is one that has for the past few years been growing in national importance. In the British Islands inquiry has already been started as to how many years their coal fields will supply the steadily increasing demands of the English factories.

In Germany, however, the limited supply has for a long time caused the inventive talent of the various nationalities, to be directed so as to obtain the most economical and perfect combustion. Mr. Ferdinand Braun, of Wiesbach, a member of the Royal Bavarian Engineer Corps, being appointed to the superintendence of a coal mine, very naturally had his attention drawn to the large percentage of waste slack or fine coal, which is found in all coal-mining regions.

This is at the present time not only a loss but a cause of expense to the miner, requiring labor to mine and haul to the surface; and also the occupancy of extensive tracts of land upon which it may be allowed to accumulate. Many attempts have already been made to use this material pressed in blocks with coal tar, refuse petroleum, etc.; but even allowing this to be practicable, it requires a large outlay for labor and machinery. Mr. Braun viewed this problem from another standpoint. His predecessors had accepted as a fact the form of furnace now in general use, and endeavored to so manipulate the fuel as to allow of its use in them, but his labors were directed to construct a form of furnace in which this waste material could be burned without any change in the fuel. The accompanying engravings show the furnace which he invented.

Fig. 1.

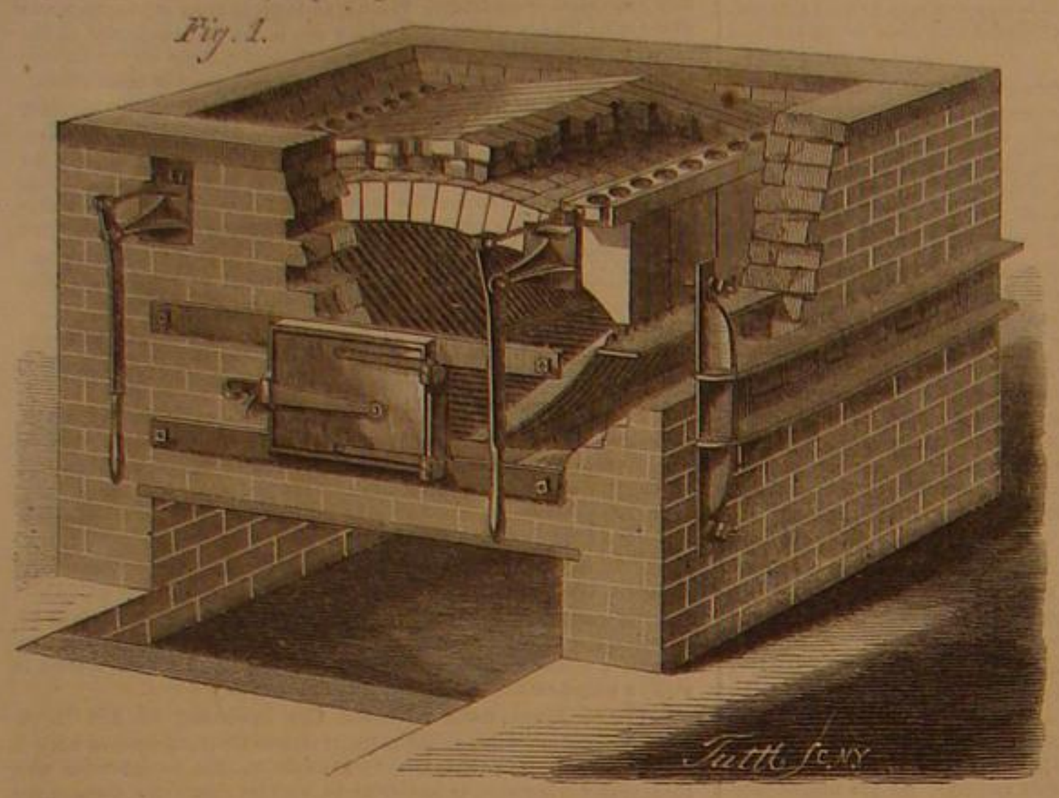
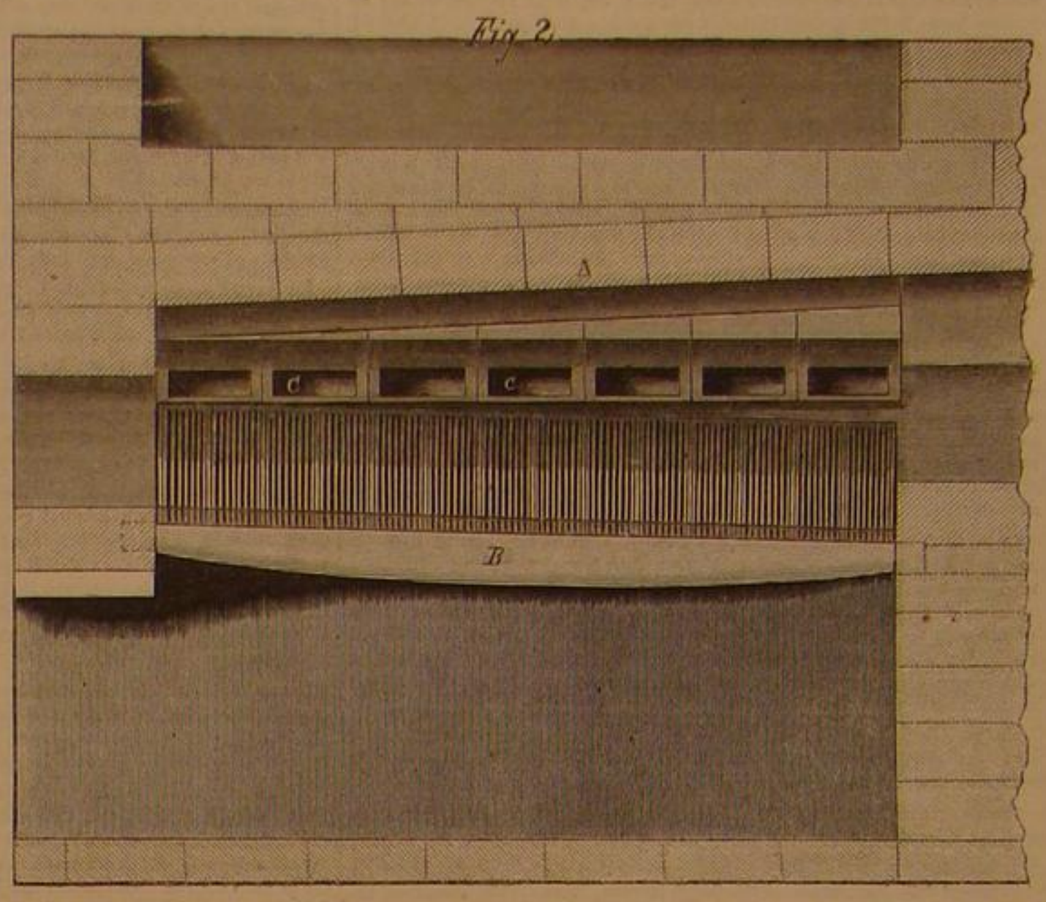


Fig. 2.



BRAUN'S BASKET GRATE FURNACE.

It is adapted for burning fine and dust coal, peat, sawdust, spent tan, etc. Fig. 1 is a perspective view of the furnace with a portion of the wall broken so as to show the hopper or fuel chamber over the arch, the passage through the skew backs in the arch, from the fuel chamber to the grate in the fire box, the inclination of the grates from the sides to the middle of the fire, the levers and slides for regulating the amount of fuel fed to the fire, the fire-box door, used only for cleaning the fire, and the arch of fire brick or other refractory material.

Fig. 2 is a section through the middle of the fire, showing the inclination of the arch, A, upward, and the inclination of the grate, B, downward, from the front to rear, also the feed passages, C, for the fuel, which are at intervals from the front to the back, at the spring of the arch on both sides of the furnace. To burn this fine material requires that it should be in a thin layer and evenly distributed over the surface of the grate. This form of furnace meets these requirements by a continuous automatic feed from both sides of the fire, throughout its whole length, the feed being caused simply by the law of gravity causing the fuel to fall through the feed passages and slide on the inclined grates.

The advantages of this furnace are burning an inferior and cheaper material, and by means of the radiated heat from the arch a perfect combustion is obtained. The saving in weight arising from this perfect combustion of fuel amounts in practice to twenty per cent, in addition to that from the lower price of the fuel.

A great desideratum for the bituminous coal regions is that the perfect combustion in this furnace allows no smoke to escape, thus furnishing an easy and available remedy for the dingy clouds of smoke which envelope so many of our large manufacturing cities.

The patent for this invention in the United States was obtained through the Scientific American Patent Agency, May 17, 1864. It has since been assigned to the Fuel Saving Furnace Company, of New York City, which has been organized with a capital stock of $200,000 for the purpose of purchasing said patent and doing all acts incident to the manufacture and introduction of the furnaces.

For further information call upon or apply to William Ennis, President, or J. W. Cole, Secretary, at the office of the Company, No. 205 Broadway, New York City.

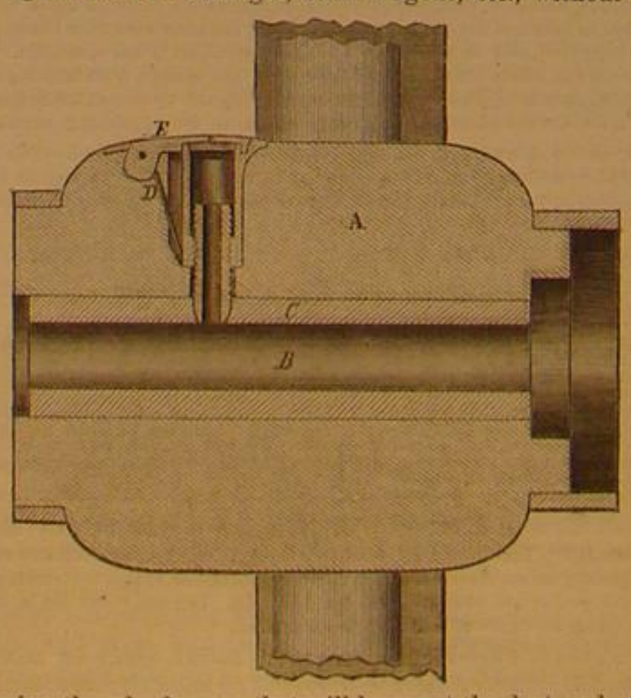
RELIEF OF THE CITY--ELEVATED RAILROADS.

The experimental half-mile section of the West Side and Yonkers Elevated Railway, for which the surveys have been already made in the lower part of Greenwich street, is to be the initiative, if successful and approved, of three lines conditionally authorized by the legislature, from the Battery to western, middle and eastern points in Westchester county The west side line runs through Greenwich street to Ninth avenue, and thence by the most eligible route by way of Kingsbridge to Yonkers. The eastern line proceeds through Pearl street, Bowery, Third avenue and between Third and Second avenues to Harlem bridge, and thence to New Rochelle. The middle line runs through Broadway to Sixty-fourth street, and thence to probably the east side of the village of Yonkers, where large tracts of most eligible building land await direct railway communication with the city to develop into great value both to present proprietors and the public.

These structures are to be supported on wrought iron columns in line with the curb stone, twenty-five feet apart. The track, which is to be of steel on a bed of india-rubber, will thus overlap the road and sidewalk equally. In the upper part of the city, right of way may be bought through the center of blocks, in the usual manner. Passenger stations will be provided, as far as possible by renting second floor rooms adjoining, with inside stairs and ornamental bridges conducting to the road, at intervals of from 1,500 to 2,500 feet. The cars are to be propelled by stationary steam power, imparted through a half-inch steel wire rope running between the rails. The estimated cost is from $300,000 to $500,000 per mile. After the experimental section is built, it is to be examined by three commissioners, two appointed by the Governor and one by the city authorities. Should the report be favorable to the road, not only as practicable but in no way interfering with the comfort of the community, or dangerous to life upon or below it, the companies shall then have the right to build the roads to Yonkers and establish a ferry over Harlem River. The construction of the Broadway road will require the consent of the Common Council.

CALKIN'S AXLE OILER.

The object of this invention is to obtain a ready means of oiling the axles of carriages, team wagons, etc., without removing the wheels; one that will keep out the dust and still be adapted to every size of hub by simple adjustment. It is a tube formed in two parts, one to slide or be screwed within the other to adapt its length to hubs of varying diameters.



In the engraving A is a section of a hub and B the axle arm on which the box, C, turns. The oiler is of cylindrical form and is let into the hub by a mortise, a suitable recess being made for the action of the lever cap and spring, D. In the upper portion of the tube is a smaller tube either screwed in or made to slide, and held in place by a set screw or other device. Preferably it is screwed in as shown in the engraving. By this means the tube may be elongated or contracted to suit the size of the hub. The cap, E, fits flush with the flange of the oiler when closed, and is held in position, either open or closed, by the spring, D. It is opened only to introduce the oil. The upper tube directly under the cap has a flanged annular recess in which is a disk of rubber, cork, or other elastic substance which prevents leakage of the oil or the introduction of dust. A small hole in the cap gives admission to air to force the oil to the axle.

This contrivance is perfectly simple, cheaply made, and easily applied. There are no detached parts to be lost and its operation is uniform and efficient. John H. Calkins and W. T. Young, of Troy, Pa., should be addressed for further information.

The Russian American Acquisition.

The following is the substance of information in regard to the Russia America, derived from Professor Baird, of the Smithsonian Institute:

Means of Information.—Has had two explorers in that field between one and two years, who returned last autumn, bringing a collection of specimens of natural history, extending from the British possessions to the shores of the Polar sea

Climate, Temperature.—The coast from Prince of Wales Island to the entrance of Behring's Straits during the winter months is about the same as at the city of Washington. Little snow, much rain. During summer months, very foggy.

Timber.—Whole country well up to the northern coast heavily timbered, chiefly hard pine forests; small trees up to the very shores. Some of the islands heavily timbered with pine forests and dense underbrush; some of them destitute of timber, and covered with grass of luxuriant growth. The soil on the west coast produces excellent barley and roots, such as radishes, turnips, and esculents, such as lettuce, cabbage, etc.,

Animals.—Furred animals, such as sea otter, river otter, sable, furred seal, mink, foxes, black, silver, red, etc., in great great numbers. Red deer in the south, reindeer in the north.

Fish.—Herring, salmon, halibut and codfish abound in exhaustless numbers. Behring's sea and northward, great whales are very numerous.

Minerals.—Surface washings of gold have been discovered on the headwaters of streams, on the east side of the coast range of mountains. Geological developments the same on the west slopes. Native copper has been discovered in various places on the coast, and in the vicinity of Copper river. Iron ore of excellent quantity, now being smelted and worked by Russian artisans in repairing ships, etc. Coal is found in large quantities, used by the Russians for naval purposes, similar to New Brunswick coal, but not equal to Cumberland coal. Recent discoveries have been made of what is believed to be a better quantity of coal, not yet tested.

Inhabitants.—Five or six thousand Russians, and fifty or sixty thousand Indians and Esquimaux. The Esquimaux inhabit the coast on the Northern sea; are industrious, peaceable, and tractable, and live by hunting and fishing. The Inhabit the interior, and live by hunting, fishing, and trapping.

A Salt Mountain.—A communication read before the Scientific Association of San Francisco, describes a salt mountain resembling that in Louisiana, which became famous during the rebellion. It is situated near Muddy river, about 100 miles from the Great Bend of the Colorado, in Arizona; is about a mile wide by "several" miles long, and 400 feet high. The salt is nearly pure chloride of sodium. The old Spanish maps locate a "mountain of salt" in about the same position. Prof. Blake stated, as a remarkable fact, that he had found chloride of calcium by a recent analysis of salt brine brought from the neighborhood of St. Helens, Oregon

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NEW YORK, SATURDAY, MAY 25, 1867.

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CAUTION.

It has become necessary for us to state very distinctly that the Scientific American Patent Agency Offices are at No 37 PARK ROW, and not at No 39.

THE ASCENT OF MOUNTAINS.

Mountains, next the almost illimitable ocean, are the grandest objects on our planet—grand in their immensity and in the opposition they offer to all the efforts of man to overcome their obstacles to his progress. They constitute, more than the sea, the natural divisions between peoples and nations. Their barriers are so effective that on one side may be found one people with one language, one set of customs, one government, in short, one nationality, while on the other side is a different people, different language, customs, and government. Besides this they are the look-outs of the earth. From the top of a mountain peak the eye can take in hundreds of miles of territory on either side, comprising cities, harbors, villages, farms, the wilderness and the "wide, wide world."

But to get to this elevated stand-point, that is the rub. Mount Washington, a favorite summer resort for our tired citizens, rears its head only 6,226 feet above the sea level, yet its ascent is so fatiguing, and sometimes dangerous, that a carriage way has been built, and now a railway is in progress to enable those who most need the exhilarating atmosphere of our mountain tops, the weak, the feeble, and the work-exhausted, to rise from the sweltering valleys to the pure air of the mountain. We gave illustrations and a description of a plan for this purpose in our issue of March 5, 1864, Vol. X., No. 10. Following this example, it is stated that it is in contemplation to build a similar railway on the sides of some of the Alps, which rise from 9,600 to 15,700 feet. The completion of this enterprise, if ever undertaken, would diminish the "pride of strength" and the charm of success in overcoming obstacles, which add so much in the opinion of some to the *eclat* of a European tour; but it would be a great advantage to hundreds who now, from want of constitutional stamina and bodily strength, must content themselves with viewing the tops of the mountains from the humility of the valley, seeing but never possessing.

But cannot some cheaper method and safer plan be devised than an inclined railway, the cars on which are elevated by means of a stationary engine? On inclines not too rapid the ordinary locomotive could be used by the aid of the third or cramping rail, but on steep inclines as from the brink of one precipice to another no such means could be available to overcome the natural obstacles. As it is now, the attempts of engineers are not directed so much to finding a passage over the tops of mountains, or even hill, but to secure a way from side to side either by passing around the base or tunneling through the mountain. Both the elevated railway system and the tunnel are costly—costly in construction and in operation, and dangerous in use.

In our issue of March 30th we gave illustrations of a plan for overcoming these difficulties proposed by Dr. J. A. A. Fontaine of New York city. By reference to that copy of our paper his idea may be understood, but we will give a few of the principal details to enable our readers to form a more intelligent opinion of its merits. In the application of his idea to the ascent and descent of declivities the apparatus used is simple and comparatively inexpensive. It is merely a gas holder intended to neutralize the weight or gravity of the load, guided by wire ropes stretched from point to point, with which deeply grooved wheels engage. Attached to this gas holder or balloon, is a compartment for the reception of passengers or freight, which constitute the loads and is carried up the incline by the ascensive force of the confined gas, the wire ropes being the guide to the direction of the ascent. Arrived at the top of the incline, or the summit of the mountain, and the apparatus being ready to descend, a portion of the gas contained in the elevating reservoir is pumped back to the foot of the declivity into a proper receptacle, reducing the ascensive power and thus increasing the positive gravity, which power, when sufficient to overcome the negative gravity, will bring the zero self-mover back to its place of starting.

This device has not, as yet, been tested on a large scale, but there seems to be no obstacles to its operation for practical purposes which may not be overcome by the resources of mechanical skill and scientific knowledge. The inventor intends to make a practical application of its merits and demonstrate its value on the hights of Hoboken or at Hudson in a few weeks. The device is worthy investigation by our scientific men and capitalists.

THE MISSISSIPPI LEVEES.

The war did more in some instances than to temporarily depress industry and destroy the works of the husbandman. The effects of the ruin wrought in some cases are of national importance. Such is the cutting of the Mississippi levees which turned many square miles of valuable and productive territory into a waste of waters. An appropriation of $4,000,000, has been made by the legislature of Louisiana to rebuild and repair the levees, a work that should have been undertaken by the general government, if for nothing else, for the sake of securing uniformity in the results, but it is a work of a national character, as the river which the levees protect is a highway for a continent and these levees extend for over 130 miles. The levees are made of soil, clay, or turf, strengthened with cypress logs and vary from five to fifteen feet in hight and from ten to thirty feet in width or thickness.

A prominent engineer, Mr. G. W. R. Bayley, proposes an improved method of constructing the embankments which seems well calculated to withstand the ravages of time and wear. He says: The disastrous results consequent upon the construction of inadequate levees, simple embankments of earth, without support or protection from the ravages of crawfish or the action of the river waves, show conclusively that a different mode of building and maintaining them must be adopted. Newly constructed levees of earth, unsupported, and unprotected, cannot be depended upon, but it is claimed that with suitable support and protection they can be guaranteed against failure. A system of piling, with heavy cypress timber, sheet piling and revetment of three inch cypress planking properly constructed in front, or on the river side of all large and important levees, will protect and preserve them from the borings of crawfish, from leaks, from the action of river waves during storms, from being cut by evil disposed persons and from all other sources of danger.

This year's experience proves that a new or green levee of earth will not stand with a rear or land slope of two to one, or two feet horizontal to one foot perpendicular. With this slope, when saturated with water, the earth sloughs off, or slides down, taking a flatter slope and thereby diminishing the width at top. The front is washed down by the action of the river waves, and a crevasse is the result.

The plan I venture to propose is, to increase or extend the rear or land slope to not less than three to one, and to substitute for the very flat, or four to one, river side slope adopted by the Levee Commissioners—a work of piling, sheet-piling and inclined revetment of cypress timber and planking. This work to be made of piles, driven fifteen feet into the ground, in two rows, ten feet from center to center in the line of the levee, and distant from each other equal to the hight of the levee. Horizontal pieces to be bolted to the front row of piles above and below ground, a trench being dug about five feet deep for the latter, and sheet-piling driven to a depth of ten feet below the surface, or five feet below the bottom of the trench, in front. The front row of piles to be cut off five feet above the ground, and the rear row at the hight of the levee, which should be not less than five feet above the highest water line. Inclined timbers to be bolted to the heads of the front and rear rows of piles. Then horizontal pieces to be bolted, about five feet from centers, to these inclined timbers, and the whole covered with three-inch planking. The lower ends of the inclined planking to be fitted to the inner side of the sheet piling.

It may be objected that it will cost too much, but security and safety should be the true measure of economy. It is thought, however, that the saving in the amount of earthwork by substituting this kind of protection for the four to one river side slope would equal very nearly if not quite the cost of it. Such a work, if made of good cypress, would not need repairs for ten years.

Millions have been expended in the construction of inadequate levees, and untold millions have been lost by their failure. Nearly all of the new levees, particularly in upper Louisiana, have been swept away. Would not reliability and safety be a sufficient equivalent for a small increase in expenditure? The river accommodates itself quickly to every increase or diminution of its high water discharge. A decrease adds to the sand bars and contracts the sectional area by diminution of current; an increase washes them away and increases the section by an increase of current. With a greater velocity of current, and a larger sectional area, a greater quantity is discharged in a given time with the same, or even less surface slope.

We must make levees in such a manner and of such hight and strength as cannot break, and thus reclaim and protect the whole valley, or we must surrender the whole to destruction. No middle course is possible; it must be, in the very nature of things, either all levees or all outlets. Although the first effect of the building of levees of sufficient hight and strength, (protected in front,) from the river's mouth to Cairo, or in such a manner that they cannot give way, would be an increased rise, yet immediately afterwards the river channel would be accommodated to the increase, the sectional area would enlarge by the washing away of the sand bars—or a portion of them—and the greater quantity would be discharged in the same time by an accelerated current and a diminished slope—the river surface would be reduced.

WOODEN PAVEMENTS.

The city government having authorized the laying of Nassau street from Pine to Spruce with the Nicolson wooden pavement, and the Mayor having withheld his approval until he can hear objections, has brought the question again before the public.

The past experience of New York with wooden pavements has been unfortunate. Many years since a block on Broadway, between Chamber and Warren streets, was thus paved, and its even surface, freedom from creation of noise, etc., gave such general satisfaction that it was copied in other streets, and one block was put down, where the Nicolson pavement now is, in Nassau street between Wall and Pine. But after a considerable period of wear, some of the blocks began to decay, and this state once arrived at, almost all the rest of the blocks rolled out at once. In heavy rains also water collected under loose blocks, which floated, thus causing unsafe footing for which, and other reasons, wooden pavements were dismissed.

Those pavements were, however, of larger blocks of wood than those now used; were of octagonal form, and placed, on end, each one touching the other, upon a foundation bed of sand. There was no provision to exclude water, which settled between the blocks, and aided their decay. The construction and practical operation of the Nicolson pavement, both of which we described lately, are entirely different in these respects. A further test made on the 4th inst. by the Croton Board showed that not only is this pavement taken up and replaced with peculiar facility, but the sand beneath remains dry and the wood unassailed by decomposition and even unworn to any perceptible extent, by nine months of the severest usage to which pavements are liable.

Still, there is no sufficient reason to conclude that the Nicolson pavement is the *ne plus ultra* of human ingenuity and nature's resources. Before any more large paving jobs of any kind are decided on, we hope to see a capable commission appointed to examine and test the different methods, including several which are yet in the background—such as Stafford's and others—as well as to stimulate further invention to do its best, if not already done, for this important object.

AMERICAN STANDARD FOR BOLTS AND NUTS.

Several years ago we strenuously urged the establishment of a standard for the number of threads on different sizes of bolts, the object being to secure uniformity throughout the country, to the advantage of all who used machinery of any kind. The subject was also treated by the Franklin Institute, and a committee was appointed by that body who recommended a form of thread, the relative proportions of heads, nuts, and shanks, and the number of threads for different diameters. We believe their decisions could not be materially improved upon, and cordially recommend their standard for general adoption.

Mr. Edward Lyman, engineer and machinist, of New Haven, Conn, whose advertisement may be found in another column, has embodied the results of the committee's labors on a lithographed sheet, which gives the dimensions and proportions of nuts and bolts from one quarter of an inch diameter to three inches, drawn to full size and the measurements properly designated. A section of the form of thread adopted, much enlarged, is also given.

COPPERED IRON HULLS.—Although the French Government is liberally sustaining Mr. Bernabé's experiments, and has ordered one of its iron-clad vessels, *Le Belliqueux*, to be coppered by the plan of M. Roux, it is unknown, at least to the public, how the disintegration of the connected metals in sea water is to be obviated. It is a law of electricity, that where two metals in conductive proximity are both brought in contact with a fluid, that which is electro-negative to the other must be dissolved, with an energy proportionate to the activity of the fluid, and the difference between their electric states. It is not seen how the new experiments are to be exempted from the failure which has attended their predecessors, unless a ship's copper can be guaranteed against all flaws, accidents, and abrasions. A communication to the *Mechanics' Magazine* suggests enveloping iron hulls with planking, on light ribs, the interspaces being filled with some kind of asphaltic concrete, and the wooden skin sheathed with copper in the usual way.

BOND'S BOILER FEEDER.—We direct attention to an advertisement on another page of this apparatus, patents for which were secured through the Scientific American Patent Agency in this country and England. It has been fairly tested and has secured the unqualified commendations of practical men who have it in constant use. It is simple, cheap, and not liable to become deranged in operation. We think it worthy the attention of our engineers and users of steam power.

SAFETY BLASTING POWDER.—Tehleisen, a chemist of Wurtemberg, has patented a blasting powder which he calls kaloxylin, and which is not exploded by a blow, a shock or friction. The carbonaceous ingredient is cellulose prepared from sawdust of hard non-resinous woods, (nine parts) with three parts of charcoal, and forty-five parts nitrate of potash.

THE first gold discovered in the United States was found in Cabarrus county, N. C., in 1799.

[From our Foreign Correspondent.]

JOURNAL OF THE PARIS EXPOSITION.

Paris, April 16th 1867

The exhibition is now rapidly approaching completion and it is difficult to see how it can be claimed that it has failed to realise the expectations that had been formed of it. Certainly there never before was brought together such a collection of machinery of all kinds, never were so many excellent pictures and fine pieces of statuary by living artists exhibited in a single enclosure, and to the spectator nothing could exceed the general elegance of the building and its contents. Large as it is, the main building alone would be entirely inadequate to contain all the articles exhibited, and probably fifty per cent is added to the collection by what is comprised in the annexes and subsidiary buildings which almost fill the grounds. These are very various in their character as we have in one place a chapel containing specimens of ecclesiastical art which, though by reason of its surroundings appearing small, is really larger than many a village church, in another, two buildings devoted to paintings which alone would form a fine collection, and in another a model barn and barnyard in which four or five cows are comfortably stalled besides a good number of sheep, hens etc. Another building contains Armstrong's and Whitworth's display of guns, besides some specimens of armor plate, one piece 12 inches in thickness; others again are filled with machinery of various descriptions such as locomotives, lathes and cotton gins for which space could not be found in the grand gallery.

AUSTRIAN LOCOMOTIVES.

Perhaps the most remarkable part of the exhibition is the collection of locomotives that have been brought together. The design of some of these is of the most extraordinary nature and this is especially true of the good engines from France and Austria. Begining in the Austrian department we find a pair of engines by Sigl, of Vienna, one a goods, and the other a passenger engine. The foreman has eight coupled wheels 4 feet in diameter, and outside horizontal cylinders 20 inches diameter by 25 inches stroke. The piston rods are prolonged so as to pass through the forward cylinder head so as to sustain the weight of the pistons. The wheels have outside bearings of rather narrow width. The framing is ormed of two plates about ½ inch thick placed about 1¼ inches apart and filled in with wood, the depth being more than two feet, but with much of the central part cut away. The cylinders which project considerably from the frame are bolted to the top and bottom portions of the latter, the steamchests being placed above the cylinders. It hardly seems possible that this fastening can be sufficiently strong for cylinders of this size. The valve gear is placed outside, the eccentrics being carried by an overhung crank, and is of the straight link kind. Judging merely by eyesight measurement it is not proportioned so as to give a correct distribution of the steam. The connecting rod takes hold of the last wheel but one, and the three after wheels are connected by compensating levers, the forward one being independent. As this is situated at about the center of the length of the slides and therefore has the entire overhanging weight of the cylinders, it would appear that the weight on this axle must be excessive. The after axle also has the whole of the firebox overhanging it. The wheel base is 12 feet 9½ inches, which is not too long, a slight amount of end play being allowed in the forward axle. The engine is intended for wood burning and has an American chimney. The top of the boiler is slightly raised over the firebox.

The passenger engine by the same maker, has four coupled wheels and a single pair of leading wheels of a less diameter. The cylinders are placed outside, and the steam chests pass through the frames (which are quite similar to those of the goods engine) the valve gear being of the usual form of shifting link motion. There is a tolerably free access to the valves but the cylinder fastening as near as can be judged, is no better than in the other engine. For an exhibition where the prime object is to show the details of mechanical construction the example of one exhibitor is to be commended, who has sent an engine entirely without lagging. Many points about the engines we have been noticing are obscured by unsightly sheet iron casings. The drivings are 5 feet 3 inches in diameter and the wheel base 13 feet 1 inch the three axles being placed at nearly equal intervals of 6 feet 6 inches and 6 feet 7 inches. The cylinders and firebox overhang the extreme axles in this case also. The springs over the driving axle boxes are connected by equalizing levers. The boiler of this engine is made flush, and both engines have cabs, but are entirely devoid of beauty in any respect, and are just such engines as one would always expect to find dirty and neglected. They are fitted with a form of injector patented in Germany by Schan, which is of the fixed nozzle class.

A NOTED LONDON LOCOMOTIVE.

Close to these engines stands the "Steyerdorf," an engine exhibited in 1862 at London and constructed for working the heavy gradients on the South Austrian Railway. It has ten coupled wheels driven by a single pair of outside cylinders, but the peculiar feature about it is that the two after pairs of wheels are arranged so as to swivel on a fixed center in order to avoid the evils of a long wheel base. To permit the use of coupling rods with this arrangement an intermediate shaft is placed directly above the axle of the forward pair of the four swivelling wheels, in bearings in the end of a stout link or coupling rod from the axle below it and it thus necessarily maintains a constant distance from that axle. Another link with spherical bearings connects the bearing of the intermediate shaft with the bearing of the after pair of fixed wheels and thus the distance between these two is maintained constant also. The intermediate shaft carries a crank at its extremities and coupling rods extend from this to a crank on the axle below it, and in an inclined direction to the crank of the after pair of fixed axles. The connection between the bogie frame and that of the rest of the engine is made by means of a stout pin connecting two stiff cross girders of wrought iron running horizontally between the opposite sides of the engine. The cylinders are a little over 18 inches diameter, by nearly 25 inch stroke and the steam chests are inside between the frames. The driving wheels are fitted with steam brakes which consist of a pair of cylinders placed vertically underneath the barrel of the boiler the piston rods working downward and being connected by suitable levers to a shaft placed above the wheels, an arm on which carries a wooden brake block pressing on the top of the wheel. The diameter of the wheels is but 3 feet 3½ and the coupling rods therefore come very near the ground. The engine weighs in working trim 4½ tuns and has a tender for carrying water only, the upper part forming an ordinary freight car.

LOCK NUTS NOT UNDERSTOOD.

I have noticed one singular fact in walking through the various departments which I think deserves mention. It is that apparently none of the European exhibitors understand the action of lock nuts and therefore how they should be arranged. In every case where any difference is made in the thickness of the two nuts the thinner one is placed outside. Now if we suppose two nuts to be jammed against each other we shall see that they will each be pressed equally against the sides of the thread in opposite directions. When any external strain therefore comes upon them the inner one will be more or less relieved from pressure against the thread until, if the force be sufficient, it becomes merely a distance piece between the body bearing against it and the outer nut. Of course in such a case it does not work, and indeed as long as it bears against the side of the thread against which it was at first forced, it only increases the strain on the outer nut transmitted from the pressing body. Could any thing be more meaningless therefore than to use a thin nut for the outer one and a stout one beneath it? To my surprise almost the only engine I have observed that has these nuts rationally arranged is Mr. Corliss', though it is certainly surprising that so simple a matter should not be better understood. In the American department generally, however, both nuts are made of the same size probably to avoid the labor of turning down from the usual size, but this is certainly much more reasonable than to turn down a nut, then give it all the work to do and use a thick one to keep it tight.

ENGLISH OPINION OF THE AMERICAN LOCOMOTIVE.

Our American locomotive, despite its gaudy ornamentation, attracts a good deal of attention, and much commendation. It may not be improper for me to mention that a day or two since Mr. Beyer of the firm of Beyer & Peacock, generally considered the best locomotive builders in England, after examining it carefully and pointing out many of its defects to the gentleman in charge of it, concluded his remarks by saying to a friend "Well there are a good many bad things about that engine, but it is undoubtedly the best engine in the Exhibition." Those who know Mr. Beyer will not accuse him of being over fond of commending foreign machinery.

Slade.

A FLOURING MILL AND BAKERY IN FULL OPERATION.

The London *Engineer* gives the following:—

"The next building is a flouring mill and machine bakery combined, and complete in all their parts. It is a very tasteful wooden edifice, two stories high, besides some rooms in the foundation; it is about 100ft. long by 40ft. wide, and has a verandah, Swiss fashion, around the upper story. On the ground floor of the building are a range of ovens of various makes, and for different fuels, including gas. Opposite them are sundry forms of machine kneading-troughs, besides some for ordinary hand work. At the north end on this floor are two pair of millstones, and another pair close to them which have a sifting arrangement within their case by which the bran is taken off and one quality of fairly white flour discharged without further manipulation. A horizontal Hugon gas engine of three horse-power gives motion to the dough kneading machinery. There are two very handsome marble counters outside the principal door, at which bread is sold as well as within the building, which is generally crowded to excess in the afternoons. 22,000 penny rolls alone were sold on Easter Monday.

Marine Life-Saving Inventions.—The labors of the Commissioners are rapidly approaching completion. The public examination of the multitudinous contrivances for the better protection of human life and property on shipboard, has been closed and now the Board is busily engaged in secret session in comparing the merits of these several devices, as indicated by the results obtained in their practical operations. All inventors who have had dealings with these gentlemen, speak highly of their uniform courtesy and attention to the oftentimes labored and protracted explanations of the enthusiastic patentees. The official report, we are informed, will be made public soon after its presentation.

Iron Permanent Way.—To the German experiments described in a recent number of the Scientific American, England adds a remarkably simple method in use for twelve months past under a short piece of track on the Southwestern Railway, near Vauxhall. Upon the under side of the rail is bolted a series of bed plates, of ¼inch iron, two feet long, of nearly the same width, and alternating with blank spaces of about equal length. The plates hollow slightly beneath, and rest on the gravel like a saddle. The success of the experiment is said to be perfect, in regard to evenness, durability and elasticity, and the whole expense of the structure and track per mile, compares with that of a track with wooden sleepers (in England) is put at £580 to £614.



ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING MAY 7, 1867.

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.

64,397.—Compound Structure of Rubber and Fiber for Belts and other Purposes.—William A. Adams, Franklin, Mass.

I claim a compound structure of vulcanized rubber and fiber in which the disposition of fiber is substantially that specified.

64,398.—Apparatus for Drying and Seasoning Lumber by Super-heated Steam.—C. F. Allen, and Luther W. Campbell, assignors to themselves and A. T. Hall and A. J. Ambler.

First, We claim a superheating steam generator which is constructed and supplied with water and arranged within a drying kiln, substantially as described and for the purposes explained.

Second, In a drying kiln, we claim the arrangement of a divisional pan, F, within the generator, E, for the purpose of protecting the latter from contact with water, substantially as described.

Third, The floors, A1, A2, with space between them, arranged at the top of the kiln, in combination with the ventiducts, b, leading into the kiln from beneath the drawing apartment, substantially as described.

Fourth, In combination with the escape valve, g, of the superheating generator we claim the balance valve, a, communicating with the open air, substantially as described.

Fifth, The elevated water tank, G, pipe, e, pan, F, in combination with a superheating generator which is adapted for drying purposes, substantially as described.

Sixth, We claim a provision for conducting off the moisture from a point which is below the desiccating chamber or kiln in which superheated steam is employed for drying purposes, substantially as described.

64,399.—Awning.—George H. Bancroft, Philadelphia, Pa.

I claim the ratchet wheel, D, detents, a a', cords, b b' metallic rods, c, and the metallic hooks, f f f, etc., when combined and arranged, substantially as and for the purpose herein specified and described.

64,400.—Pneumatic Tube.—A. Ely Beach, Stratford, Conn.

I claim the employment in combination with pneumatic walls or tubes of automatic valves operating substantially as herein shown and described.

64,401.—Pneumatic Car Truck.—A. Ely Beach, Stratford, Conn.

I claim the employment of pneumatic trucks made substantially as herein shown and described.

64,402.—Pneumatic Railway.—A. Ely Beach, Stratford, Conn.

I claim the employment of the within described device in combination with pneumatic tubes, substantially as set forth.

64,403.—Horse Hay Fork.—D. S. Blue, Fremont, Ohio.

I claim the shaft, A, slide, B, slots, b d, and arms, E F, in combination with the lever, C, wrist, f, and catch, D, arranged and operating as and for the purpose substantially as set forth.

64,404.—Sewing Machine Tuck-Creaser.—Edward Bostock, Albany, N. Y.

First, I claim the tuck creaser or folder for use with or without a sewing machine made and operated as specified.

Second, I also claim in combination the gage plate, N, constructed as described, the plate, A, and the creasing wheel when both plates are adjustable relatively to each other, and also relatively to the needle and feeding device of the machine, by means of a single thumb screw.

Third, I also claim in combination with the plate, A, which carries the creasing devices the gage plate, N, having a downward projection, W, on the same for the purpose of sliding or adjusting it along the plate, A, in such a manner as to secure a parallelism of the straight edge with the line of creasing and stitching.

Fourth, I also claim the socket or bridge, L, fixed firmly upon the plate, A, for embracing and keeping in true position, the wheel supporting bar, D H, and also for the reception of a thumb screw, M, for adjusting the vertical pressure of the wheel or creaser.

Fifth, I also claim constructing the arm, D, with a right angled projection which supports the wheel, as and for the purpose specified.

Sixth, I also claim the combination of the right angled projection on the wheel carrying arm, D, with the right angled projection on plate, A, when the same are constructed and arranged to operate as described.

64,405.—Refrigerator.—James Bragdon, Boston, Mass.

I claim in a refrigerator so constructed as to have between its food chamber and the casing thereof an air space, the air passages, f l and k, so located and arranged in conjunction with the deflectors, h and i, and the falling water from the melting ice to establish a current of pure cool air and through the food chamber, substantially as described.

64,406.—Means of Attaching Handles to White Wash Brushes.—William B. Burtnett, New York City.

First, I claim the construction of the ferrule, D, with an eye, b, and with a series of grooves around said eye in combination with a staple, B, and a set screw, G, substantially in the manner and for the purpose set forth.

Second, The combination of two or more screw-tapped lugs, g g, with the open grooves, e f, on both sides of the ferrule and with the eye, b, substantially as and for the purpose set forth.

64,407.—Piano Forte.—Pierre Eugene Chollet, New York City.

I claim the combination with the levers, E and H, the latter of which is provided with the hooks or their equivalents, I claim the use or employment of the notched head, screw, and pointer for the purpose set forth.

64,408.—Forging Machine.—L. L. Crane (assignor to himself and Leavett Crane & Co.), Cleveland, Ohio.

I claim the dies, J K, constructed as described in combination with the anvil and trip hammer, B D, all arranged and operating as set forth.

64,409.—Car Brake.—S. F. Dimock, Spencer, Ohio.

I claim, First, The adjustable link, E, rollers, H and I, in combination with the rod, G, shaft, T, spool, V, arranged and operating substantially as and for the purpose set forth.

Second, The adjustable link, E, rollers H and I, in combination with the shafts, J W, and gearing P and L, arranged and operating as and for the purpose substantially set forth.

Third, The shafts, J W gearing P and L, in combination with the rollers, Q, adjustable stay, N, wheel, C arranged as and for the purpose substantially as specified.

64,410.—Device for Forming Letters on Type Blocks.—Daniel A Draper, Cambridge, Mass.

I claim the combination of the within described devices for producing letters, figures, etc., upon the edges of the type blocks for hand stamps and other purposes, substantially as set forth.

64,411.—Manufacture of Artificial Teeth.—William E. Dunn, Delaware, Ohio. Antedated Feb. 2, 1867.

I claim a denture constructed by the application of biscuited and unglazed teeth to the plastic body or base while in the mold, substantially as described.

64,412.—Washing Machine.—Francis Elder, Chester, South Carolina.

I claim the combined arrangement of the ledges, h h i i, cover, H, rubber H, movable journal caps, I I, and dasher board, E, both above and below the rear or upper edge of the rubber, B, as specified.

64,413.—Wagon Brake.—S. J. Farr, Medina, Ohio.

I claim the arrangement of the slotted coupling pole, D, bar, E, brake arrangement, e e G G, lever, J, and staff, I, substantially as described.

64,414.—Steam Blower.—M. Foreman and J. R. Mathewson, Philadelphia, Pa.

We claim a steam pipe, E, in combination with two or more pipes, A A', of different diameters, the whole being arranged and operating substantially as described.

64,415.—STOVE PIPE DAMPER.—William T. Gray, Galesburg, Ill.

I claim the combination and arrangement of the fan wheel, with the circular plate and ring, the parts being arranged and operating in the manner and for the purpose specified.

64,416.—APPARATUS FOR CRUSHING AND AMALGAMATING ORES.—James Hart, Melbourne, Victoria.

I claim the combined arrangement of the cylinders, L M P, constructed and working substantially as herein described.

64,417.—FENCE POST PEDESTAL.—G. W. Hatch, Garretsville, Ohio.

I claim the construction of a metallic pedestal, A, provided with ventilating openings, G, in combination with the post, E, for the purpose and in the manner, substantially as described.

64,418.—VELOCIPEDES.—F. G. Hoeppner (assignor to himself and Charles Burchardt), New York City.

I claim the compound lever, G g h, in combination with the body, A, of the toy and with the ratchet wheel and pawls or their equivalents mounted on the axle, C, substantially as and for the purpose described.

64,419.—MODE OF COATING WOOD WITH RUBBER AND GUTTA-PERCHA.—K. W. Holmes, McGranville, N. Y. and Andrew Albright, Dryden, N. Y.

We claim the coating and lining of wood with rubber, gutta-percha or prepared gum, substantially as set forth.

64,420.—MACHINE FOR CUTTING SCREW TAPS.—William and James Holroyd, Waterford, N. Y.

We claim, First, The vertically adjustable tool rest, D, vibrating plate, D', and sliding support, E, in combination with rotary centering points, b b', substantially and for the purposes described.

Second, The application of the rotary pattern, F, to an adjustable bar, H, which is applied to a treadle, K, substantially as and for the purposes described.

64,421.—BITTERS.—Jacob D. Holtzermann, Piqua, Ohio.

I claim the compounding or combination of the above named ingredients in proportions above as set forth.

64,422.—MODE OF DEFLECTING THE BOTTOMS OF VESSELS MADE OF SHEET METAL.—L. T. Hulbert, Painesville, Ohio.

I claim the use of the independent rotary head, fig. 1 constructed and operating in combination with the former fig. 2, in the manner substantially as specified and for the purpose set forth.

64,423.—HOLLOW AUGER.—Morris Isbell, New Haven, Conn.

I claim the divided head, B, in combination with the springs, C C, the land, D, and the adjusting screw, E, all constructed and arranged to operate substantially in the manner described.

64,424.—TUBE FOR STEAM GENERATORS.—C. H. James (assignor to himself and Frank Millward), Cincinnati, Ohio.

I claim the stationary or rigid confined tube, K, provided with one or more enclosed ducts or passages, L, communicating the outer or fire tube, I, with the water space on the crown sheet of the boiler, the outer tube, I, extending and discharging its contents above the water line or above the passage, L, communicating with the inside tube, K.

64,425.—MANUFACTURE OF IRON.—Jacob Jameson, Philadelphia, Pa.

I claim, First, The production of wrought iron direct from the ore by the process, substantially as described.

Second, In combination with the oven, A, constructed as described, I claim the double furnace, I, as set forth.

Third, I claim the combination of the oven, A, furnace, I, and gas chamber, P, for the treatment of ores when arranged for joint operation, substantially as described.

64,426.—KEY HOLE GUARD FOR DOOR LOCKS.—William Johnson 2nd, Haverhill, Mass.

First, I claim the combination as well as the arrangement of the key hole guard, F, and its operation mechanism, viz: the spring, G, the stud, I, and the cam, K, with the bolt and the lock case provided with a key hole as set forth, such guard being for the purpose as specified.

Second, I also claim the combination as well as the arrangement of the stud, L, and the projection, d, with the lever guard, F, applied to the bolt, B, and to operate therewith and with respect to the key hole of the lock, substantially in manner as hereinbefore described

Third, I also claim the combination as well as the arrangement of the stud, L, and the catch, e, with the lever guard, E, applied to the bolt, B, and to operate therewith and with respect to the key hole of the block, substantially in manner as hereinbefore explained.

Fourth, I also claim the combination as well as the arrangement of the spring latch, M, its catch slot and the projection, N, or their mechanical equivalent, with the lock case and with the lever guard, F, applied to the said case, and the main bolt, substantially in manner and so as to operate with respect to the key hole, essentially as and for the purpose hereinbefore set forth.

64,427.—FAUCET.—T. J. Jones, Summit, N. J., and T. L. Webster, Brooklyn, N. Y.

First, We claim holding the plug of a faucet or stop cock to its seat by means of a spring which is inserted into or through a recess made transversely through said plug, substantially as described.

Second, The construction of the V-shaped spring, C, with a centering notch in it, for the purpose specified.

64,428.—JOINT FOR CHIMNEYS.—Marvin H. Kelsey, Red Bank, N. J.

I claim the metallic collar, A, for chimneys having the gutters, a, upon each side, substantially as described for the purpose specified.

64,429.—CULTIVATOR.—Abraham B. King, Camden, Ohio.

First, I claim the arrangement of two outer cultivators, F A S J F''' A''' S''' J', and two inner and smaller ones, F' A' S' K F'' A'' S'' K', so coupled together by the pieces, G M D, and their described accessories as to be held rigid, or to swing from side to side, or to be separated into two distinct double-share cultivators, in the manner described.

Second, The arrangement on the inner or land side, and in rear of a cultivator share of one or more independently-attached laterally-projecting blades or cutters, T, substantially as and for the purpose stated.

64,430.—GRATE FOR STOVES.—Henry G. Leonard, Taunton, Mass.

I claim, in combination with a tipping and horizontally vibrating grate, the lever, i, into a slot in which a pin or projection from the grate works when the lever is applied to the cross shaft or axis, c, and operate the grate, substantially as set forth.

64,431.—APPARATUS FOR THE PREPARATION AND ADMINISTRATION OF NITROUS OXIDE GAS.—A. M. Leslie, St. Louis, Mo. Antedated April 23, 1867.

First, I claim the combination and arrangement of the tubes, b, in the cap f the jar, and the tubes, D and d, substantially as herein described and set orth.

Second, I claim the employment of the india rubber tubes, D, for connecting the different jars together and these to the generator and receiver, and for conducting the gas down through the water.

Third, I claim the portable apparatus, A B, when constructed and employed, substantially as herein described and set forth.

Fourth, I claim the inhaler, E, when constructed with the valves, e and e'.

64,432.—BABY TENDER.—Landon Limerick, Louisville, Ky.

First, I claim the arrangement of chair, E H I, adjustable forward or backward, along a spring, C, for the object explained.

Second, The combination of base, A, spring, C, sliding chair, F G H I, and auxiliary spring, E.

Third, The chair, F G H I, with the brackets, K K1 L, knobs, N O, adapted for a sitting or any recumbent position and supported upon a spring or yielding rest, substantially as set forth.

64,433.—FOUNDATION FOR ROOFS.—Robert O. Lowrey, Saratoga Springs, N. Y.

I claim a plastic foundation for roofing cement, prepared and applied substantially as herein described.

64,434.—SPRINGS FOR VEHICLES.—David Dick Matteson, Harmonsburgh, Pa.

I claim a spring for carriages or buggies constructed of one piece of steel bent or formed in the manner described, constructed in the aforesaid combination and for the purposes set forth.

64,435.—GOVERNOR.—Thomas B. McConaughey, Newark, Del.

First, I claim the governor arms, a a, in combination with the main piece, B, and loose collar, d, as and for the purpose set forth.

Second, The springs, c c, in combination with governor arms, a a, substantially as and for the purpose specified.

64,436.—OIL CAN.—John S. McIntire, Chicago, Ill.

First, I claim the narrow neck, B, arranged relatively to the can, A, and side spout, D, substantially as and for the purposes specified.

Second, The arrangement and combination of the narrow neck, B, the funnel, C, side spout, D, and vent tube, F, with the can, A, substantially as set forth.

64,437.—HOSE COUPLING.—Barney Mee, Troy, N. Y.

First, I claim a packing ring applied in a recess in the male part of a coupling in combination with a female member of the same coupling, the combination being substantially as specified.

Second, I claim, in combination with a packing ring, applied and acting as specified, and the male and female parts of a coupling, a bayonet fastening, or the mechanical equivalent, or substitute therefor, for holding the parts in place until pressure is applied to the packing ring, the combination being substantially such as set forth.

Third, I claim an annular recess, in combination with the male part of the coupling, and with holes leading into it from the hollow of the coupling, forming a seat and an apparatus for applying pressure to a packing ring, the combination being as described.

Fourth, I claim an annular recess, formed in the periphery of the male part of a coupling, provided with holes leading into it from the hollow of the coupling, in combination with the female part of a coupling, whereby a packing ring may be applied so as to pack a coupling joint, the combination being as described.

64,438.—HAND SPINNING MACHINE.—N. M. Mendenhall and J. Judd, Terre Haute, Ind.

First, We claim the lever, p, notched bar, q, reversing pinion, O, gear wheels, l and l', and pinions, m and n, pulley, s, and cord, s', in combination with the carriage, c, as and for the purpose specified and set forth.

Second, The vibrating bar, y', spring, 7, cord, y'', trip bar, y''', link, 9, lever, 10, cam bar, 5, cam, 6, arranged and operated substantially as above described and for the purpose specified.

64,439.—METHOD OF MOVING BUILDINGS.—John H. Moore, Binghamton, N. Y.

I claim the construction of the frame, A, and the roller, B, in combination with the parallel bars or scrapers, G, the lever and lock, H, the hooks, P, the bolster, C, as represented and described.

64,440.—STAIR ROD.—William A. Morse, Philadelphia, Pa.

I claim, First, A stair rod made of paper, paper pulp, felt, cloth, leather, or other equivalent fibrous material, lacquered, gilded, or otherwise ornamented to resemble highly finished brass, substantially as described and for the purpose specified.

Second, I claim the use of paper, paper pulp, felt cloth, or leather, either separate or in combination, in the manufacture of stair rods, substantially as specified and for the purpose set forth.

Third, I claim the use of either of the above-named materials in combination with wood or metal, substantially as specified and for the purpose set forth.

64,441.—WINDOW.—John B. Mulvey, Visalia, Ky.

First, I claim the combination of the solid window frame, G G', spring pulley style, E, and locking device, H I i, substantially as shown and set forth.

Second, The locking device, composed of the square bolt, H, removable key, I i, and cleat, J, as set forth.

Third, Attaching the cords of the weight to the sash by means of the grooves, k k, the recesses, l l' m m', the pins, n n', and knots, o o', substantially as set forth.

64,442.—SHOVEL.—D. B. Nelson, Elmira, N. Y.

I claim constructing shovel blades with teeth, substantially as as and for the purpose set forth.

64,443.—COMPOSITION FOR PAINTING AND VARNISHING.—Samuel Page, Chelsea, Mass.

I claim treating the light distillate by additional substantially as and for the purpose described.

64,444.—ATTACHING BITS IN BRACES.—L. J. Parsons (assignor to himself and Henry Reynolds), New Haven, Ct.

I claim the combination of the plate, a, with the socket, B, and sleeve, C, constructed and arranged so as to operate substantially as herein set forth.

64,445.—WASHING MACHINE.—Marvin Pierce, Buffalo, Wis.

I claim the combination of the rotary cylindrical rubber, E, sweep, C, slotted uprights, B B, and washboard, A, the latter having the opening, a, and soap shelf, p, and all being constructed and arranged as herein described and represented.

64,446.—FIREPLACE.—Albert J. Redway, Cincinnati, Ohio.

First, I claim surmounting the fire chamber of a grate or stove with the arched crown, C, which extends from the front to the back of the fire chamber, and is provided with the side flues, D D', all arranged and operating in the manner herein described and set forth.

Second, In combination with the crown, C, and side flues, D D', I also claim the flue strips, G G', and abutments, H H, for the purpose specified.

64,447.—APPARATUS FOR ROLLING WRENCH BARS.—T. C. Rice (assignor to Thomas H. Dodge and T. W. Wellington), Worcester, Mass.

First, We claim the herein described combination of machinery for rolling wrench bars and other similar articles, organized substantially as herein shown and described for operation as set forth.

Second, The combination with the tongued segment roll, H, and grooved segment roll, I, of the stationary stop, f, and table, L, all constructed and arranged substantially as and for the purposes set forth.

Third, The combination of the notched segment roll, J, and flanged segment roll, K, constructed arm arranged for operation as described.

Fourth, The combination with the notched segment roll, J, and flanged segment roll, K, of the table, 3, and stationary stop, h, substantially as and for the purposes set forth.

Fifth, The combination with the notched segment roll, M, and flanged segment roll, N, of table, 4, and adjustable stop, s, substantially as and for the purpose set forth.

Sixth, The combination with the tongued segment roll, Q, and the grooved segment roll, R, having the flanges, x x, cut or inclined as shown at c', of the table, 6, and adjustable stop, as and for the purposes stated.

64,448.—HORSE COLLAR.—Daniel T. Robinson, Boston, Mass.

I claim, in the manufacture of horse collars, forming the roll of strips or layers of raw hide, arranged upon the collar, and secured together in the manner and for the purposes substantially as herein set forth.

64,449.—MANUFACTURE OF PAPER PULP.—C. A. Rose, Columbus, Ga.

I claim the combination of pine leaves and cotton stalks, either with or without the addition of oak leaves and pine cones, as a material for making paper pulp.

64,450.—TRANSMITTING MOTION.—Warren Rowell, New York City.

I claim the combination of the cranks, D D' D'', and arms or rods, E E' E'', or other suitable connection, so arranged relatively with each other that when rotary motion is imparted to the crank, D, it will be transmissible to the cranks, D' D'', and the shafts connected thereto, as herein described.

64,451.—TRANSMITTING MOTION.—Warren Rowell, New York City.

I claim the hereinbefore described means for transmitting a continuous coincident rotary motion.

64,452.—BEER COOLER.—Philip Schweikhart, Buffalo, N. Y., assignor to Daniel Schweikhart, Eden, N. Y.

I claim, First, A beer cooler having an ice box, B, a chamber, C, containing the liquid, and an air flue, D, and fan blower, E, or equivalent, constructed, arranged, and operating substantially as herein described.

Second, Cooling beer or other liquids by dividing the same into a large number of fine streams, and forcing an ascending current of cold air through the descending liquid, in the manner and for the purpose substantially as herein described.

Third, The perforated plate or troughs, F, having flanges, f1 f2, arranged in the manner substantially as herein described.

Fourth, The sleeves, G G1, in combination with the chamber, C, for the purpose and substantially as described.

64,453.—RAILWAY CHAIR.—Thaddeus Selleck, Greenwich, Ct.

I claim, in combination with the rails, A A, the flanged plate, C, extending the distance of three or more intervals of the ties, the clamp, D, extending across the middle interval and embracing the point of junction of the rails, and the end clamps, E E, all arranged substantially as herein described and represented.

64,454.—TOOLS FOR CUTTING OFF BOILER TUBES.—William P. Slensby, Chicago, Ill.

I claim, First, The combination and arrangement of the revolving head block, B, the adjustable cutter holder, D, and the slotted collar, F, as and for the purposes set forth and shown.

Second, I claim, in combination with the above, the shaft, A, and ratchet handle, C, operating as specified and for the purposes described.

64,455.—TOOTH BRUSH.—Thomas H. Spencer, Providence, R. I. Antedated April 23, 1867.

I claim the tooth brush having a detachable handle and a dentifrice container therein, substantially as described.

64,456.—PROOF METER AND REGISTER FOR ALCOHOLIC SPIRITS AND OTHER LIQUIDS.—William Mont Storm, New York City.

I claim, First, The float, E, acting as a hydrometer, and carrying a pencil or pencils, or any equivalent, in combination with the drum, G, covered with paper or some equivalent, rotating in contact with such pencil or pencils, or their equivalents, so that they shall describe a line denoting the varying specific gravity of the liquor flowing through the instrument.

Second, I claim the diagram, Figs. 3 and 8, in combination with my instrument, having the hydrometer scale in horizontal lines upon it, and vertical lines to denote gallons, etc., as explained.

Third, I claim having the pencils, independently of their rise and fall with the hydrometer or float, E, acted upon by changes of temperature, substantially in the manner and for the purpose described.

Fourth, I claim the use of two pencils, acting in the manner and for the purpose explained.

Fifth, I claim the use of the overflowing well, A, for the purpose described.

Sixth, I claim the application of the spring, v, or any equivalent device, for the purpose set forth.

Finally, I claim my instrument as a whole, its parts being constructed and operating together, substantially in the manner and for the purpose explained.

64,457.—LIQUID METER.—William Mont Storm, New York City.

I claim, First, The arrangement of the valve, i, rod, j, and lever, l, operating in conjunction with the sleeve, z, and piston rod, f, as and for the purpose described.

Second, I claim regulating a liquid meter, constructed substantially as described by means of the adjustable pistons, f f, as and for the purpose explained.

Third, I claim the glass cylinder, a, embracing a piston or pistons, moving on a central rod, and supported by a perforated exterior case, as and for the purpose specified.

64,458.—AMALGAMATOR.—Walter L. Strong, San Francisco, Cal., assignor to himself, G. W. Strong, and J. F. Taylor.

I claim, First, The shoes, e e and g g, in combination with the attaching joints, d and h, and the arms, D and G, substantially as and for the purpose described.

Second, The geared wheels, L m m, and the rim, n, in combination with the shaft, F, and muller, G g, as described.

Third, The wrench, O, with the shaft, P, operating upon the wheels, m m, rim, n, and shaft, F, substantially as and for the purpose described.

64,459.—HAY LOADER.—Luman D. Taylor, Granville Center, Pa.

I claim the arrangement in the pivoted and adjustable frame, D, of the belt, G, and auxiliary delivery belt, J, substantially as described and represented

64,460.—CHURN DASHER.—Johnson Thomas, Huntingdon, Pa.

I claim the adjustable dasher and butter gatherer, H and G, the lower perforated circular dasher, B, the adjusting rod, L, the atmospheric tubes, D, and their ball valves, E, at top, all in combination, when constructed, arranged, and operated as herein described, and for the purposes set forth.

64,461.—NOSE JEWEL FOR SWINE.—M. G. Tousley and F. E. Marcellus, Fulton, Ill.

We claim the arrangement and construction of the device, when constructed, arranged, and operating as and for the purpose above set forth.

64,462.—HORSE HAY FORK.—Maynard J. Turck, Schodack, N. Y.

I claim the arrangement and combination of the jointed cross bar, A A, fines, F F, cross bar, B, trip cord, t, and pulley, P, substantially as and for the purposes herein set forth.

64,463.—CHURN.—Marquis D. Wallace, White Creek, N. Y.

I claim the combination of the frame, B b, and adjustable telescope shaft, I, constructed and operating as described.

64,464.—PLOW HANDLE.—George Watt, Richmond, Va.

I claim the curved metallic socket, A, constructed as described, and employed for the purpose specified.

64,465.—FIRE PLACE.—Marshall D. Wellman, Pittsburg, Pa.

First, I claim the combination of the shallow recess, g, in the back wall, or back wall and side walls of a fire place, with the opening, i, and flue, k, substantially as and for the purposes hereinbefore set forth.

Second, Making the rear part of a fire basket with grate bars, e e, parallel to each other, and closer together than the bars, d, that compose the front part of such fire basket, substantially as and for the purpose hereinbefore described.

Third, The combination of the dust holes, m m, furnished with slides, n n, the air passage, l, and flues, k, for the purpose hereinbefore described.

Fourth, The use of the tapering grate bars for the purpose of diminishing gradually the amount of air admitted to the fire, as the space between the bars.

Fifth, Perforating the tapering grate bars with air holes, for the purposes hereinbefore described.

64,466.—MACHINE FOR FOLDING CLOTH.—Walter Wheeler, Jr. (assignor to himself, Pardon Jenks, and E. O. Potter), North Providence, R. I.

First, I claim an apparatus for folding cloth, which employs two sets of folding clamps, or the equivalent thereof, acting in alternation, to hold the cloth suspended by the upper folds already made, while a new fold is being laid, and operating for the purpose substantially as described.

Second, The combination in a machine for folding cloth of the following: first, delivering rolls or equivalent means for supplying cloth to be folded; second, an inclined conductor, F, and transverse folding bar, G', and two sets of clamps working in alternation, all substantially as herein described.

64,467.—MODE OF DISINFECTING COFFINS.—Samuel H. Young, St. Louis, Mo.

First, I claim deodorising and disinfecting corpses by enclosing the same in a receptacle wherein chlorine, or other equivalent, or disinfecting gas is continuously generated and liberated, substantially in the manner and for the purposes herein set forth.

Second, The combination of a disinfecting and deodorising compound with the interior of a coffin, in such a manner as that there shall be a gradual and constant generation and liberation of a disinfecting and deodorising vapor in the coffin, substantially in the manner and for the purpose herein set forth.

64,468.—ATTACHING CARRIAGE THILLS.—H. S. Allen, Granger, Ohio.

I claim the hook or head, C, provided with a slot, a, in combination with the pin, D, cheeks or jaws, E, and back piece, F, arranged as and for the purpose set forth.

64,469.—CULTIVATOR.—John H. Allison, Eureka, Ill.

First, I claim the harrows, I I, connected together, and to the front part of the frame, A, as shown, in combination with the foot lever, F, all arranged to operate in the manner substantially as and for the purposes set forth.

Second, I claim the adjustable driver's seat, D, in combination with the harrows and foot lever, substantially as and for the purpose specified.

64,470.—ORGAN PIPE.—E. B. Andrews, Osborn Hollow, N. Y.

I claim an organ pipe, having its throat, B, upon the outside, with the tuning plug, C, back of the throat, substantially as and for the purpose described.

64,471.—CHURN.—Stephen Ballard, Sen., Sullivan, Ind.

First, I claim the combination of the knives, P, and hinged or jointed arms, N and O, with the dasher shaft, J, substantially as described and for the purpose set forth.

Second, The combination of the circular dasher, L, constructed as described with the dasher shaft, J, substantially as described and for the purpose set forth.

Third, The combination of the frame, E, and gearing, G H I, with each other and with the sides and top or cover, D, of the churn, A, substantially as described and for the purpose set forth.

64,472.—FRUIT PICKER.—John Bally, Deposit, N. Y.

I claim the jaws, A and B, constructed as described and provided with knife, C, shield, i, and spring, when used in combination with the socket, F, and bag, C, for the purposes specified.

64,473.—SOAP.—S. J. Beeler, Wales, Ill.

I claim the use of the ingredients herein named in the proportions substantially as set forth, when treated as described, for the manufacture of a new article of chemical erasive soap.

64,474.—LAMP.—Henry M. Beidler, Chicago, Ill.

I claim a metallic conductor to conduct heat from the illuminating flame of a lamp down into a tube or hollow case below, to rarefy the air therein, and cause an ascending current of air to feed the flame, substantially as described.

64,475.—HAND RAKE.—Calvin Bissell, Aurora, Ohio.

I claim the herein described rake in its special construction and arrangement in the manner and for the purposes specified.

64,476.—COFFEE POT.—John Blackie, New York City.

First, I claim a coffee pot constructed with the three compartments, A' B' and E, and the tubes, C and D, or their equivalents, in combination, to produce the effects set forth and described.

Second, A coffee pot, constructed with an inner and outer receptacle communicating with each other, so that the water shall be heated in the outer and then pass in to the inner, and so that the vessel containing the solution of coffee shall be surrounded by an air or water space, and the said solution thereby prevented from being heated to the boiling point, substantially as set forth.

Third, The leaching vessel, G, and tube, H, provided with the cap, I, in combination with the tube, D, and chambers, B' and E, substantially as and for the purpose set forth.

Fourth, The siphon, C, in combination with the compartments, A and B, and the tube, D, substantially as and for the purpose set forth.

64,477.—BENCH PLANE.—Benjamin A. Blandin, Charlestown, Mass.

I claim combining with a mechanism for clamping a plane iron in position, the rocking bed piece, l, supported and rolling in a concave seat, k, and serving to support and adjust the cutting edge of the plane iron, substantially as set forth.

64,478.—HOLLOW AUGER.—George E. Booth, Seymour, Ct.

First, I claim the circular cutters, D, pivoted eccentrically with the axial center of the auger, and operated substantially as and for the purpose specified.

Second, The plate, E, with the rack, c, and pinion, b, arranged substantially for the purpose set forth.

Third, The thimble, F, in combination with the barrel, A, and the cutters, D, substantially as described.

64,479.—STEAM GENERATOR.—Edward Bourne, Pittsburg, Pa.

I claim so arranging and combining the tubes with relation to the fire box and the water space therein, as that the smoke or products of combustion not only pass through the interval tubes, but can be made to pass around the outside of and between the external tubes or surrounding cylinders, substantially as herein shown and set forth.

64,480.—IRONING BOARD AND CLOSET.—James N. Brewster, Brooklyn, N. Y.

I claim the ironing board constructed with a hinged slide, e, arranged to operate in the guides, b, and in relation with the bars or steps, f and n, substantially as herein set forth for the purpose specified.

64,481.—PEGGING MACHINE.—B. Q. Budding, Milford, Mass.

I claim, in combination with the vibrating awl and the peg tube, the retainer tooth, f, so arranged in relation to the awl that the awl will be driven into the hole previously made by the tooth, substantially as and for the purpose set forth.

64,482.—HAY LOADER.—Jonathan Bullis, Macedon, N. Y.

I claim the arrangement of the detachable hollow crane post, P, elevating cord, C, drum, D, and vibrating pulley shaft, S, with its sliding box, f, and lever or connection bar, l, and the pulley, p, in connection with the driving wheel, w, attached to the ground wheel, G, of the wagon, when said parts operate in the manner and for the purposes shown and described.

64,483.—SIGNAL WHISTLE.—P. S. Burditt and O. Preston, Haskinsville, N. Y.

First, We claim the valve, E, cylinder, C, piston rod, D, and cord, I, all combined and operated as and for the purpose set forth.

Second, The sliding plate, G, spring, H, roller, J, and pulley, K, all combined and operated as and for the purpose specified.

64,484.—BUCKET EAR.—Henry Callahan (assignor to himself and John Reese), Dayton, Ohio.

I claim the bucket ear, B, when constructed substantially as described.

64,485.—HOT-AIR FURNACE.—Edwin H. Camp, Jackson, Mich.

I claim the two tiers of tubes marked a and c, in combination with the space, D, substantially as described for the purposes specified and in combination with the furnace.

I claim the diving flue, E, and the bent tubes, F, arranged substantially as described in combination with a hot-air furnace.

64,486.—DOOR STRIP.—George W. Carpender, Jarvis, Ind., assignor to himself and P. C. Stuart.

I claim a hinged weather strip, C, which in closing the door is raised by the guide, E, over the threshold and forced into a vertical position by pressure against the jamb, against which it rests in front of the threshold when the door is closed, substantially in the manner set forth.

64,487.—ATMOSPHERIC RAILROAD.—A. H. Caryl, Groton, Mass.

First, I claim the tube, arranged as specified, for the holding of compressed air, in combination with tanks or reservoirs on the cars which supplies the engines that propel the cars, substantially as described and for the purpose specified.

Second, I claim the iron tube placed on iron columns or otherwise suspended or supported above the carriage way to support a railroad track or tracks, as set forth, when such tube is strengthened by a vertical iron partition or when made with perpendicular walls, in the manner described for the purpose specified.

Third, The combination of the pipe, B, rings, C, ways, D, bars, E, bars, F, diagonal arms, G and rods, H, and pillars, A, in the manner described for the purpose specified.

Fourth, The supply tubes, O, in combination with bosses, P, arms, Q, and sliding tubes, R, operating with the tube, S, and admitting the compressed air into the receptacle, N, substantially as described as and for the purpose specified.

64,488.—PICTURE FRAME.—Lewis S. Chase, New York City.

I claim the frame for advertising and other purposes constructed with the bars removable or detachable by unscrewing the button and the other bars with grooves for allowing the glass to be removed, and arranged substantially as herein recited.

64,489.—SHOE LACER.—William H. Christie, Albany, N. Y.

I claim the hook doubled at the stem and curve with the ends thereof projecting below the stem for inserting through the shoe or other article and clamping thereto when formed of one strip of metal, and constructed and arranged as herein specified.

64,490.—CHURN POWER.—John Christley, Slippery Rock, Pa.

I claim the combination of the walking beam, D, handle, H, vertical bar, E, pendulum rod, K, treadle, I, connecting rod, C, spring, L M, dasher rod, F, and fly wheel, substantially as described for the purpose specified.

64,491.—PISTON PACKING.—C. H. Clark, Wilmington, Del.

First, I claim the packing rings, B and C, of wedge-shaped form with the recess, i, between their faces and with the saw parted and slotted ends in combinaton with a piston.

Second, The valves, a and b, in combination with the packing rings and the apertures through the piston head, substantially as described.

64,492.—SASH STOP.—Calvin Cole, Ithica, N. Y.

First, I claim the combination of the friction wheel, b, having a limited sliding movement with the friction bearing or surface, c, and the sustaining cord, d, substantially as herein described for the purpose specified.

Second, The combination of the slotted adjustable piece, e, with the sustaining cord, substantially as herein described for the purpose specified.

64,493.—COMPOSITION ROOFING.—M. Converse and A. C. Torry, Jordon, N. Y.

We claim the mode of covering roofs by coatings of felt and a mortar composed of the ingredients named, and compounded, combined and applied substantially as set forth.

64,494.—TOOL HOLDER.—E. W. H. Cooper. Hartford, Conn.

I claim the chuck, B, either sectional or split in combination with the conical socket, a, in the tool holder, A, constructed and operating substantially as and for the purpose set forth.

64,495.—SCREW SWEDGING MACHINE.—E. Cope and J. R. Maxwell, Cincinnati, Ohio.

We claim, First, Constructing said rolls with right and left-hand screws respectively and arranging them so that the threads upon one shall bend the metal into the grooves of the other, all substantially as above set forth.

Second, Also in combination with the subject matter of the first claim, we claim leaving a portion of the surface of the rolls plain or blank, in the manner and for the purpose described.

64,496.—METALIC BURIAL CASE.—Martin H. Crane (assignor to Crane, Breed & Co.), Cincinnati, Ohio.

I claim, First, A metallic burial caskat stiffened by sheet metal drawn over wood and secured to the body of the case by soldering, in the manner and for the purpose set forth,

Second, The combined arrangement with the body proper of the wood and metal rim or rail, C, for the reception of the screws employed to fasten the lid in the described combination with the composite wood and metal styles, the said rail sill and styles being formed separately from said body, and the sills, B, and afterward firmly soldered thereto and to each other, as set forth.

64,497.—STEAM CONFECTION PAN.—George H. Cross, Montpelier, Vt.

I claim the hollow shaft, D, attached to the pan, the steam pipe, E, passing through the shaft, the reversed T G, and the pipes, H and J, in combination with a steam confectioner's pan, the whole constructed, arranged and operating substantially as herein shown and described.

64,498.—MACHINE FOR CUTTING TOBACCO.—J. W. Crossley, Bridgeport, Conn.

I claim, First, The radius arm, E, fixed plate, e, provided with the curved slot, d, the lever, G, and pin, c, cam, M, and knife bar, D, all arranged in the manner substantially as and for the purpose set forth.

Second, The screw, T, with the plunger, U, attached nut, S, ratchet wheel, V pawl, W, and arm, R, all combined and arranged to form the feed mechanism, as set forth.

Third, The adjustable rod, N, and screw bolt, n, for the purpose of regulating the throw of the pawl, W, as set forth.

64,499.—APPARATUS FOR EXTRACTING OIL FROM HERBS AND FOR OTHER PURPOSES.—L. Daubert, Louisville, Ky.

I claim the annular chamber, C, with the furnace or fireplace, B, within said chamber in combination with the pipes, D E, and boiler, A, arranged as and for the purpose set forth.

64,500.—STEAM-ENGINE GOVERNOR.—G. W. Davis and G. A. Rollins, Nashua, N. H.

We claim the revolving eccentrics, K, lifters, J, links, i, arms, g, in combination with the governor for the purpose of operating steam valves, as substantially herein set forth.

64,501.—CARRIAGE SPRING AND COUPLING.—Thomas De Witt, Detroit, Mich.

First, I claim the spring, F, having shoulder f2, in combination with the spring, D, and immediately secured to the axle, E, substantially as described for the purpose specified.

Second, The coupling, I, herein described the same consisting of the branches, 12 13 14 15, in combination with the half circle, H, constructed and arranged substantially as and for the purpose specified.

64,502.—ADDRESSING MACHINE.—Robert Dick, Buffalo, N. Y.

First, I claim the combination of the steam packing belt, with the distributors and the new arrangement of the rollers for securing the results as recited in the way and manner substantially as herein set forth.

Second, I claim the spring wire frame and the manner of connecting it with the machine for the purpose stated together with all other ways and manners, substantially the same as those herein set forth or intended to be set forth.

64,503.—EARTH AUGER.—Andrew J. Dine, Xenia, Ind.

I claim a post hole auger constructed with the parts, A D D' E E' F O G, arranged to operate substantially as set forth.

64,504.—BRICK MACHINE.—Thomas Dixcee, Woodville Road Engd.

First, I claim the crushing or grinding rollers, C, in connection with the amalgamation or mixing blades, D, and the rollers C, at the moulding orifice or orifices substantially as and for the purposes set forth.

Second, The cutting wires, a, attached to the bar, K, with the guide fences, L. L, combined and arranged to operate in the manner substantially as and for the purpose specified.

64,505.—MACHINE FOR POLISHING METAL SPRINGS.—A. B. Doolittle, Hartford, Conn., Assignor to Eli Terry, Terryville, Conn.

I claim the combination of the reels, A E, burring rollers, B, burnishing rollers, C, and bath, D, when all are respectively constructed and arranged to operate either in one and the same machine substantially as and for the purpose described.

64,506.—INTERFERING ATTATCHMENT.—Frank R. Doughty, New York City.

I claim providing the pad with the metallic spur or spurs so arranged by means of which and the straps, the pad is secured to the hoof of the horse as and for the purpose specified.

64,507.—CORSET FASTENINGS.—J. F. Dubber, Brooklyn, N. Y.

I claim the slides, C C,' made with lips, c c, to operate in combination with the springs, A A,' and seams, B B,' in the manner and for the purpose described.

64,508.—LAMP.—Michael B. Dyott, Philadelphia, Pa.

First, I claim a reservoir or fountain of glass, earthenware or other equivalent material suspended within the outer metal casing, B, substantially as and for the purpose herein set forth.

Second, The combination of the glass or earthenware reservoir, A, metal ring, D, brackets, g, and outer casing, B, the whole being arranged substantially as described.

Third, The cemented recess, f, the projecting upper edge, e, of the same and the ring, D.

64,509.—FENCE.—Freeman Ellis, Lafayette Ohio.

First, I claim a fence provided with the parts, B, arranged and constructed so as to render it adapted for being inverted, that is used either side up substantially as and for the purposes set forth.

Second, The blocks, j j, when arranged upon and confined with the pins, h h, and pulleys, i i, as and for the purposes specified.

64,510.—MACHINE FOR MAKING NUTS.—A. Emerson, New York City.

First, I claim the construction and arrangement of the slides, I L, fitted in the guides, H K, of the frame, B, and provided respectively with the dies, J M, the punch, N, in the slide, L, and fixed rod, K, in the slide, I, when used in combination with an intermediate die open at both ends, substantially as described for the purpose specified.

Second, The constructing of the die, T, with an enlarged centre when said die thus constructed, as used in connection with a punch arranged in connection with suitable dies so that in the punching operation the blank will be expanded in the enlarged part of the die, substantially as and for the purpose set forth.

64,511.—DEVICE FOR CONVERTING MOTION.—Bernhard Eybel, New York City.

I claim the arrangement of the elbow lever, F, eccentric, C, and crank I, in combination with the shafts, B H, substantially as and for the purpose set forth.

64,512.—CONSTRUCTION AND VENTILATION OF THE WALLS OF BUILDINGS.—Benjamin F. Farrar, (Assignor to himself, Edward M. Wesson and Henry Willis) Springfield Mass.

First, I claim the wall of a house or other building, when constructed with horizontal air-ducts, c c c, such air-ducts and their opening being arranged and combined substantially in the manner and for the purpose specified.

Second, I claim a break or building block, when constructed with a channel or groove extending the entire length of one or both sides as and for the purpose specified.

64,513.—STEAM GENERATORS.—Hector T. Fenton, Philadelphia, Pa.

First, I claim the cylindrical boiler its fire box, D, central flue, C, and pipes, E, the whole being constructed and arranged substantially as and for the purpose herein set forth.

Second, The combination of the above with a superheating chamber, H, situated above the central flue and communicating through pipes with the steam space of the boiler.

Third, The boxes, F, separated from the steam space by wire gauze or its equivalent and pipes, C, less in size than the boxes.

64,514.—POST DRIVING MACHINE.—C. T. Fitch, Harbor Creek, Pa.

I claim the combination of runners, A, posts, B, and braces, C, with the hook, I, inclined blocks, F, sliding guide bar, L, hammer, E, adjustable arms, O and P, sliding bar, N, and stop lever, R, substantially as herein set forth for the purpose specified.

64,515.—BEE-HIVES.—W. A. Flanders, Shelby Ohio.

I claim the ways or passages, G, for the bees commencing at one side of the comb guides, and passing through the top bars of the comb frames substantially as and for the purpose set forth.

Second, I claim the use of sanded surfaces for the comb frames as and for the purposes set forth.

Third, I claim the use of glassed or sanded paper for comb guides, M, and linings to the communicating bee passages, A,' from comb to comb substantially as and for the purposes set forth.

Fourth, I claim ventilating the hive through the top bars of the outside comb frames and preserver, H, constructed as described, from the diverging ways, W, and doors, X, and Y, of the common entrance as and for the purposes specified.

Fifth, I claim the bee entrance guard, V, having diverging passage ways, W, from the central or common ingress, Y, the same being either reversible or stationary as and for the purposes set forth.

64,516.—SHAFT COUPLING.—Henry C. Fritz, Philadelphia, Pa.

I claim a coupling divided into parts longitudinally when bolted together by bolts or screws through the flanges in combination with the sleeve or cover, H, substantially as shown and described.

64,517.—APPARATUS FOR CRUTCHING SOAP.—Joseph Gallipo (Assignor to himself and Walter Campbell), Cohoes N. Y.

I claim the arrangement of the radiating paddles, e, beater frame, f, transverse scrapers, g, cross bars, h, and transverse paddle, i, in combination with the revolving shaft, D, and box, A, constructed and operating substantially as and for the purpose set forth.

64,518.—HAY SPREADER.—Joel Garfield, Groton, Mass.

I claim in combination with rotating heads and forks and the stationary shaft, k, placed eccentrically to the axis of rotation of such heads the shafts, b, arms, l, and loops, m, when arranged to operate substantially as described.

64,519.—PLANTER AND CULTIVATOR COMBINED.—William L. Gebby, New Richland, Ohio.

First, I claim the arrangement of the arms, I I, with the shovel, K, and teeth, d d, in combination with the shaft, A, and beam B, in the manner and for the purposes specified.

Second, The hopper box D, with seed slide i, when operating by means of the lever, b, rods, c and g, and spring, e, when constructed and used in the manner herein set forth.

64,520.—HARVESTER RAKES.—William F. Goodwin, Washington, D. C.

First, I claim the jointed lever consisting of arms, A4 and A5, for communicating motion from gearing on the main frame to a rake mounted on the hinged finger bar, or platform arranged and operating substantially as described.

Second, The reciprocating bar, B, arranged in the described relation to the grain platform in combination with the vibrating arm, A5, and the rock shaft, B2, in the hollow post, P, or their equivalents substantially as and for the purpose specified.

Third, The bar, A3, arms, A4 and A5, bar B, shaft, B2, in the hollow post, P, crank arm, B3, link, B4, crank arm, B5, shaft, B6, post, B7, rod, R1, projections, R2, projecting arm M, track, E, and switches, T and T1, combined and arranged to opperate in the manner and for the purpose substantially as described.

Fourth, The post, P, having a hole made through it to receive and support the shaft, B2, in combination with the projecting arm, N, flattened on the top of said post, P, substantially as and for the purpose described.

64,521.—HARVESTER RAKE.—William F. Goodwin, Washington, D. C.

First, I claim the swinging bent arm, H H' mounted on the projecting arm of post, P, arranged and operating substantially in the manner and for the purpose described,

Second, The sliding bar, M, rods, C C,' and crank arms, K K2, or their equivalents operating in connection with the swinging arm, H, and rake, R, substantially as and for the purpose described.

Third, The sliding bar M, provided with roller, E, arranged as described, and operated by the track, T, substantially as and for the purpose described.

Fourth, The track, T, switches, S S, and yielding lever, L, arranged and operating substantially in the manner and for the purpose described.

Fifth, The lever, L, post, J, spring, J,' and stud, O, arranged and operating substantially as described.

64,522.—HARVESTER RAKE.—William F. Goodwin, Washington, D. C., and Arthur W. Browne, Brooklyn N. Y.

First, We claim the plate, P, with its recess W, the projecting stud, U, on the cam M, and the rod T, combined and arranged to operate in the manner and for the purpose substantially as described.

Second, Crank, S, rock shaft, S, crank arm, C1, link, C2, crank arm, C, rock shaft, B1, crank arm, B3, rod B4, and crank arm B5, combined and arranged to operate in the manner and for the purpose substantially as described.

Third, The projecting arm, O2, track, F, with its notches E E, palls q and q2, pins, q1 and q3, and hollow arm B, combined and arranged to operate in the manner and for the purpose described.

64,523.—HARVESTER REEL.—William F. Goodwin, Washington, D. C., and A. W. Brown, Brooklyn N. Y.

We claim the pulleys, A and A3, shaft, B, chains, I, bars, O, and projections, R and R1, adjustable on the posts, S S1, combined and arranged to operate with the pulleys A1 and A2, in the manner and for the purpose substantially as described.

64,524.—SAP SPOUT.—Luke Gore, Newbury, Ohio.

I claim the herein described sap spout when constructed in the manner specified as a new article of manufacture.

64,525.—LOOM.—John Graham, New York, N. Y.

I claim the shuttle at the side of the shed and the reciprocating filling thread carrier arranged in combination with the lay and reed so that the filling thread carrier crosses the shed at such distance from the cloth making point (or extreme range of motion of the reed in beating up the filling) as to carry the filling thread diagonally across the shed and shuttle race substantially as and for the purpose described.

64,526.—HEATING STOVE.—Jonathan H. Green, Christainsburg, Iowa.

I claim the arrangement of the grate C, above the bottom of the stove whose sides are open or slotted and provided with dampers P, to register therewith, and operating substantially as described as and for the purpose specified.

64,527.—DIFFERENTIAL PULLEY BLOCK.—Robert Anthony, Hardcastle of Newcastle on Tyne, Eng.

First, I claim the application and use of a sliding clutch for the purpose of coupling and uncoupling the sheaves in differential pulley blocks substantially in the manner hereinbefore described and illustrated by figure 1, of my drawings.

Second, The application and use of a sliding clutch for the purpose both of coupling or uncoupling the sheaves in differential pulley blocks and of locking one of such sheaves as hereinbefore described and illustrated by figures 11, 12, & 13, of my drawings.

Third, The application and use of lateral cogs, pins, projections or teeth on one sheave in combination with a fixed stop or catch on the frame of the pulley block both for the purpose of coupling and uncoupling the sheaves in differential pulley blocks and simultaneously locking one of such sheaves substantially as and for the purpose hereinbefore described and illustrated by figures 3 4 5 6 7 and 8, of my drawings.

Fourth, The application and use to and in differential pulley blocks of a sliding clutch or a sliding sheave in combination with a lever cord wedge or spring for producing the necessary motion for coupling and uncoupling and locking the sheaves substantially as hereinbefore described and illustrated by figures 1 2 3 and 4, of my drawings.

Fifth, The application and use in differential pulley block of one or more spiral projections or threads formed on the spindle or axis of the sheaves and being in combination with inclined teeth or projections on one of the sheaves and on the frame on the pulley block for the purpose both of coupling and uncoupling the sheaves and locking one of such sheaves as hereinbefore described and illustrated by figures 9 and 10 of my drawings.

64,528.—BED BOTTOM.—Cyrus H. Hardy, Charleston, Mass., assignor to himself and George Jaques, Boston, Mass.

I claim the series of coiled lever springs E, operated by pins D, or their equivalents substantially in the manner and for the purpose set forth.

64,529.—SKATE SHARPENER.—W. F. Hellen, Washington, D. C.

I claim the slotted guide plate B, with the adjustable screws D, and set screw E, combined with an adjustable file of any required size when constructed arranged and operated as herein described and for the purposes set forth.

64,530.—CORSET.—Edward Drucker, Paris, France.

I claim an improvement in corsets of the class in which the seams run transversely instead of up and down, such improved corset or other similar article being made of two or more sections united by an intermediate section having substantially the outline and confirmation shown and described.

64,531.—MAKING TIN COATED FOIL.—Dauphin S. Hines, Brooklyn, N. Y., assignor to John J. Crooke, New York, N. Y.

I claim forming the ingot by pouring molten lead into a tin pipe while immersed in a cooling medium, substantially as described in combination with the after process of rolling as set forth.

64,532.—STEAM ENGINE SLIDE VALVE.—Alfred Hobbs, West Cambridge, Mass.

I claim a semicircular balanced slide valve constructed and operating substantially as and for the purposes herein specified.

64,533.—LOCOMOTIVE TRUCK.—William S. Hudson, Paterson, N. J.

First, I claim the two trucks M N, constructed and arranged as represented and mounted at opposite ends of the locomotive substantially as and for the purpose herein specified.

Second, I claim in connection with the above the within described arrangement of the equalizing levers H, h, so as to equalize between the rear drivers C, and the top portion of the truck N, and allow the lateral movements of the main body of the latter without disturbing the action of the equalizing levers, substantially as herein set forth.

Third, I claim the equalizing lever G, g, and cross lever E, mounted on the front of the locomotive and arranged relatively to the truck M, and forward drivers D, substantially as represented so as in connection with the lateral moving truck N, at the rear and the equalizing levers H h, connected therewith to support the weight on the three points g h h, on independently equalizing systems of levers and wheels, substantially as and for the purpose herein set forth.

64,534.—AMALGAMATOR.—Andrew Hunter, San Francisco, Cal.

First, I claim the box A, with sides and ends lined with copper in combination with the blocks B B, and dies C C, substantially as described.

Second, The frame E, with shoes or mullers D D, suspended to frame F, by rods or bars G G, or their equivalent worked by rod J, and crank or eccentric K, as hereinbefore set forth.

Third, I claim the movable frame F, with adjusting screws I I, or their equivalent for adjusting mullers D D, to any desired hight.

Fourth, I claim covering the tops of the mullers D D, with copper.

Fifth, I claim box L, with frame M, set with skimmers and agitators, substantially as described and for the uses and purposes as hereinbefore set forth.

Sixth, I claim table O, with steps covered with copper plates, with side vibratory motion as given by driver P and rod Q.

Seventh, I claim the box A, lined with copper plates, in combination with blocks B B, dies C C, mullers D D, adjusting or movable frame F, screws I I, rod J, crank or eccentric K, box L, and frame M, with agitators or skimmers, substantially as described, and for the uses and purposes as hereinbefore set forth.

I claim the last described combination in connection with the table O, with its side vibrating motion, substantially as described and for the uses and purposes as hereinbefore set forth.

64,535.—FOLDING CHAIR.—Joseph Hyde, Troy, N. Y.

First, I claim the connecting and disconnecting of the legs G, or F, from the main part or body of the chair or couch in the manner, and by the means, or equivalent means, herein specified, thereby allowing the said chair or couch to be folded in a compact form, without disconnecting the back, seat or apron from each other, substantially as herein described and set forth.

Second, I claim the employment of the circular hook or latch fastening M, arranged in combination with the legs or other suitable part of a folding chair or couch, and operating in the manner and for the purposes substantially as herein specified and set forth.

Third, I claim the rollers R, in combination with the foot board P and apron E, of a folding chair or couch when arranged in the manner and for the purposes substantially as herein described and set forth.

64,536.—RAILROAD RAIL.—Isaac B. Hymer, Warsaw, Ind.

I claim the arrangement of the T-rail imposed upon the foot rail and the two side plates bolted thereto the contacting face of the shank a, rib b, and side plates C C, being grooved as described and represented.

64,537.—MACHINE FOR MAKING PAPER BAGS.—G. L. Jaeger, New York, N. Y.

I claim the former, B, in combination with the table A, gage C, and flaps D D', worked and operating substantially as and for the purpose described.

Also the notch e, in the edge of the former to facilitate the operation of removing the finished bags from said former as set forth.

64,538.—BOOT CRIMPING MACHINE.—Samuel W. Jamison, New York, N. Y.

First, I claim the combination in a machine for crimping boots, having a stationary tree or form of the crimping plates with the brackets for supporting the same, under the arrangement herein described so that the said plates may adjust themselves vertically or laterally to the varying thickness of the leather or tree upon which it is placed substantially as shown and set forth.

Second, The combination with the crimping plates and brackets for supporting the same of the laterally self-adjusting ways between which the said brackets slide, the said ways being actuated by weights, springs or equivalent mechanism to exert a continuous but yielding pressure upon the said crimping plates as herein shown and described.

Third, The method of supporting the said crimping plates, and the suporting brackets moving between laterally self-adjusting ways as described, from a cross head or beam sliding between the sides of the machine and receiving motion, through the medium of gear or lever or other suitable mechanism substantially as herein shown and set forth.

Fourth, The combination with the self adjusting ways or uprights of the levers and rods connecting the same with both the said uprights and the weights under the arrangement and for operation substantially as shown and set forth.

64,539.—WATER EJECTOR.—Thomas J. Jones. Madison, N. J.

I claim the pump constructed as herein described and shown, as a new article of manufacture.

64,540.—FEED WATER HEATER.—Peter M. Kafer and Joseph M. DeLacy, Trenton, N. J.

We claim a water heater for steam fire engines, constructed substantially as shown and described combining in its arrangement the regulating cylinder N, operating upon the damper substantially as set forth.

We claim the pipes B B', and the rubber or elastic pipes K, with their cocks, levers and chains, the slip joint at L, and the slip key E', constructed arranged and operating substantially as described and for the purposes specified.

64,541.—RAILWAY TRACK CLEARER.—Watson King, Springfield, Ill.

First, I claim operating the shields D, and brake shoes G, by means of the eccentrics H, upon the shaft C, substantially as herein shown and described for the purpose specified.

Second, In combination with the parts of the above, I claim the rods I, cross bar J, chains K, P, friction roller L, cross bar O, and openings S T, as herein set forth for the purpose specified.

64,542.—CULTIVATOR.—Edmond H. Knight, Unadilla, Mich.

First, I claim the beams G, having plough or shovel standards H, pivoted to them in combination with the frames F F, the beams and frames being secured to the axle A, and used in connection with hand levers K, foot levers S S, and catches R V, all arranged to operate substantially in the manner and for the purpose set forth.

Second, The springs, H* connected with the beams, G, and attached to the frames, F, substantially as and for the purpose specified.

64,543.—MACHINE FOR CLASPING HOOKS TO LADIES' SKIRTS.—A. Komp, New York City.

First, I claim reversing the spangles by the action of the spangle carrier, substantially as shown.

Second, The slotted spring receiver, g, in combination with the swinging spangle carrier, E, constructed and operating substantially as and for the purpose described.

Third, The lips, f, on the spangle guide, D, in combination with the slotted spring receiver, g, and oscillating spangle carrier, E, constructed and operating substantially as and for the purpose set forth.

Fourth, The bell crank lever, m, and stop, n, in combination with the spring receiver, g, oscillating spangle carrier, E, and hammer, H, constructed and operating substantially as and for the purpose described.

64,544.—GAS BURNER FOR HEATING PURPOSES.—Hiram Y. Lazear, New York City.

I claim the combination of the supporting tube, A, trough, B, dish, C, and perforated cylinder, D, with the central air tube operating as described, for the purpose specified.

64,545.—TURN-TABLE FOR RAILROAD.—L. E. Lee and C. Mudge, New Orleans, La.

We claim the combination of projecting points, b b' b" and g g' g', and the openings or recesses into which they enter, the pivoted levers, c c' c" and d and f f', with a railroad turntable, when the said parts are constructed and arranged for conjoint operation, substantially as described, for the purpose set forth.

64,546.—WELL TUBE.—Tristram S. Lewis, Chelsea, Mass.

I claim the tube, A, provided with one of more short perforated tubes, b, operating substantially as described for the purpose set forth.

64,547.—CAR COUPLING.—Elijah Lindsley, Neenah, Wis.

I claim the sliding bar, B, with its slot, b, and pivoted pin, A, playing into the tapering slot, D, and fastening into the hole in the spring plate on top of the coupling, substantially in the manner and for the purposes described.

And also in combination with the said slide and pin the said spring plate and lever, and other parts of the said coupling, substantially as set forth.

64,548.—GATE.—John McCreary, Middletown, Pa.

I claim a gate having a central cross bar, E, with the recesses formed on its inner surface, when used in combination with the grooved and swiveled roller, d, and the right angled hook, i, substantially as shown and described.

64,549.—WELL TUBE.—A. T. McDonald, Dubuque, Iowa.

I claim the pipe, A, perforated as described and wrapped with the coarse wire after being first wound with the finer wire, in the manner substantially as and for the purposes specified.

64,550.—HORSE RAKE.—Wm. H. McPherson, Danby, N. Y.

First, I claim the revolving tubular head, J, provided with the teeth H' and H", in combination with the cam wheel, E, spring stop, D, and lever, C, substantially as and for the purposes described.

Second, I claim the combination of the teeth, H' H", having a double right angled bend at their upper ends, the bolts, P, and head, J, substantially as and for the purposes described.

Third, I claim the use of the wheels, I and K, acting on the head, J, and moved by the hand rims, L, or its equivalent, for the purposes set forth.

64,551.—GATE.—P. L. Miller, Mechanicsburg, Pa.

First, I claim the end piece, G, provided with slotted arms, G', in combination with levers, F F', pin, I, and rods, J J', as and for the purpose set forth.

Second, The rod, J, provided with an enlargement or enlargements, a a', substantially as and for the purpose described.

Third, The pivoted latch, K, in combination with the lever, H, rod, L, rod, J', and bracket, d, as and for the purpose described.

Fourth, The combination and arrangement of the posts, A D D' E E', and bed piece, substantially as and for the purpose set forth.

64,552.—JOINT FOR STOVE PIPE.—D. L. Milliken, Brattleboro, Vt., and O. M. Pillsbury, Claremont, N. H.

I claim the adjustable band, B, provided with circumferentially swaged grooves, b, fitting over the corresponding heads, c, near the ends of the sections, A, of the stove pipe, as herein shown and described for the purpose specified.

64,553.—PEAT MACHINE.—H. C. Moore, Springfield, Mass. Antedated March 26, 1867.

First, I claim the combination of the die and press so as to co-operate with each other to cut, press, and shape the peat to the desired form, substantially as herein set forth.

Second, The combination of the endless belt, E, and plate, F, with the die, A, and press, B, the parts arranged so as to operate automatically, substantially as and for the purpose herein described.

Third, I claim the arrangement of the box, L, for the peat to pass through, so formed as to gage the amount passing through to the proper hight for the movement of the die, substantially as set forth.

Fourth, I claim for the purpose of moving the press, A, the arrangement of the slotted lever, m, and crank, k, on the shaft, H, substantially as set forth

Fifth, For the purpose of moving the die, the combination of the slotted levers, c c', and cams, b b', upon the shaft, H.

Sixth, I claim operating the draw, K, by the ratchet motion arranged and operated by means of the lever, n, and cam, T, upon the shaft, H, substantially as herein set forth.

Seventh, I claim in a peat machine the combination of rolls for grinding, and endless belt for conveying the peat, and die and press for shaping and compressing the same, substantially as herein described.

Eighth, I claim the arrangement of the openings, X X', as described, for the purpose of letting out the steam confined within the rolls intermittently.

Ninth, The box or cap, X', in combination with the die, A, for the purpose of holding the steam used for warming the die and peat operated by it, substantially as herein described.

Tenth, I claim warming the die, A, and plate, F, upon which the peat is pressed and formed, by means of steam or hot air, substantially as set forth.

64,554.—FRICTION PAWL.—Joseph Moore, San Francisco, Cal.

I claim a stop apparatus for hoisting machinery constructed with the pawls, Q Q Q, moving with the shaft, F, and the ratchet case, R, turning loosely upon said shaft, together with the brake beams, L L, levers, T and V, and weight, Z, constructed and operated substantially as and for the purpose described.

64,555.—MANUFACTURE OF SOAP.—Pierre B. Mongeot, Paris, France.

I claim manufacturing the above described soaps, which go by the names of anhydrous rectified soaps, illustrated soaps, double-faced soaps, obtained by one and the same process, that is to say, with anhydrous soap, which alone allows of the fabrication of a block or cake composed of parts of different nature, colors, and perfumes united together in the manner of mosaic work, as and for the purposes described, viz., having in one and the same block or piece heterogenial soaps made to answer various purposes, or variously illustrated and perfumed soaps, substantially as described.

64,556.—BELT PUNCH.—John Mulchahey, Springfield, Mass., assignor to himself and Charles Mulchahey.

I claim the arrangement of the awl, M, projections, H H', knife, K, spring hook, O, and bodkin, S, upon and in connection with a belt punch, substantially as set forth.

64,557.—BEE HIVE.—P. M. Myers, J. W. Walser, and John Spangler, Canton, Ohio. Antedated Nov. 7, 1867.

First, We claim the use of the four pieces, C C D D, forming a complete hopper, C D C D, when the pieces, C C, are movable in grooves, a a, substantially in the manner and for the purpose specified.

Second, The peculiarly formed bee valve, N, used in connection with the openings, R, substantially in the manner and for the purpose specified.

Third, The peculiar combination and arrangements of double box, A, having the boxes, H H, honey boxes, K K K K, ventilators, X, opening, E E, slides, F F, openings, R R, hoppers, C D C D, drawers, O, doors, B B and I I, arranged on each side thereof, and cover, G, substantially in the manner and for the purpose specified,

64,558.—POT FOR MELTING GLASS.—Carlton Newman, San Francisco, Cal.

First, I claim a pot, A, constructed with the opening, F, and flues, D D, or their equivalents, substantially as and for the purposes described.

Second, the flues, H H, or their equivalents, constructed and arranged substantially as and for the purpose described.

64,559.—FIELD ROLLER.—E. F. Olds, South Lyons, Mich.

First, I claim the disk, A, pole, G, lever, H, and spring, I, as arranged in relation to a field roller, in the manner substantially as described.

Second, Rollers, D, spring, E, and frame, B, in combination with the disk, F, pole, G, lever, H, and spring, I, in the manner and for the purpose set forth.

64,560.—COMBINED WAGON BRAKE AND DUMPING DEVICE.—L. M. Osborne, Hamilton, N. Y.

First, I claim a wagon which dumps itself by approximation of its front and rear wheels; I claim the employment of a self-acting brake which is constructed substantially as described, and connected to the front section, D', of the extensible reach by a locking latch or its equivalent, substantially as described.

Second, The transverse releasing lever, g', in combination with the latch or hook, g, and a self-acting brake, substantially as described.

Third, The combination of brake bar, F, togele or knee levers, e e, pivoted blocks, f, and brake shoes, f', with an extensible reach, D D D', and a fastening g, substantially as described.

Fourth, The brace strap, c, applied to the front running gear by the king bolt, b, and adapted for sustaining the same when backing, substantially as described.

Fifth, The sliding brace, d, and stops, d1 d2, applied to the reach sections, D D', substantially as described.

Sixth, The connecting rods, P, applied to the wagon body and front running gear, in conjunction with the rolling supports, G G, and the extensible reach, D D', substantially as described.

64,561.—DIE FOR SWAGING CALKS FOR HORSE SHOES.—Philip A. Page (assignor to himself, Wm. Brooks, and Albert Loomis), Palmer, Mass.

I claim a toe calk die constructed with the piece, B, arranged in the block, A, substantially as set forth.

64,562.—APPLYING DESIGN IN RELIEF AND BRILLIANCY TO WOVEN FABRICS.—Francis Petildidier, Paris, France.

I claim the application or production of designs upon and giving brilliancy to fabrics by printing with resinous materials, substantially as herein specified.

64,563.—CULTIVATOR.—Edward Phifer, Trenton, N. J.

First, I claim a cultivator frame composed of a series of timbers shorter than the diameter of the wheels and arranged parallel to the tongue, substantially as described.

Second, The combination substantially in the manner described of a tongue laterally adjustable on the axle with a series of frame timbers of a length less than the diameter of the wheels, arranged parallel to the tongue and adjustable laterally on the main axle.

Third, The combination substantially as described of the tongue and short parallel frame timbers with a series of slotted adjusting plates attached to the front of the frame timbers and secured to the tongue.

Fourth, The combination substantially in the manner described of the parallel frame pieces arranged for adjustment in pairs with the slotted down-haugers, front lifting rods, and drag bars, for the purpose of adjusting the front ends of the drag bars.

Fifth, The combination of the frame pieces, down hangers, drag bars, lifting rods, hand levers, and sector rack, when arranged substantially as described, for the purpose of enabling the driver to control each pair of plows by a single lever.

Sixth, The arrangement of the sector rack, hand lever, and spring detent, as described, whereby the catch acts both as a detent for the lever, and as a guide to keep it parallel with the sector rack.

64,564.—HOLLOW ARTICLES OF RUBBER AND OTHER FLEXIBLE MATERIALS.—Leonce Picot (assignor to Wilhelmine Picot), Hoboken, N. J.

I claim the application to an india-rubber ball or other hollow article required to be distended by inflation, of a flexible tube in the manner as herein specified, so that the said ball or other article may be either inflated and distended or collapsed, as and for the purposes set forth,

64,565.—ATTACHING THILLS TO VEHICLES.—Edwin R. Powell, Cambridge, Vt.

First, I claim an improved thill coupling formed by the combination of the chambered block, A, spring, D, and the pivoted plate or cap, C, having projections, c1 c2 and c3, formed upon its under side, substantially as herein shown and described and for the purpose set forth.

Second, The combination of the india-rubber block spring, E, or equivalent, with the chambered block, A, and cap or plate, c, substantially as herein shown and described and for the purpose set forth.

64,566.—ROOFING.—Seymour Pratt, Fayetteville, N. Y.

I claim a roofing composed of the tiles, D, constructed as described, placed on a bed of cement, C, laid on the boards or lathes, B, substantially as herein shown and described,

64,567.—POWER HAMMER.—Thomas F. Preston, Pawtucket, R. I.

First, I claim the connecting rods, E and D, in combination with the springs, e and f, shoulder, d, and slotted hammer (or extension of the same) F, substantially as and for the purpose herein shown and described.

Second, The construction and arrangement of the adjustable guide, C, let into the guide brace, G, and provided with a lip upon each end fitting over the upper and lower sides of said guide brace, G, its center grooved to receive the sliding guide rail, b, in the hammer, F, substantially as herein described and for the purpose specified.

64,568.—LOCK.—H. D. Richardson (assignor to himself and Robert Russell), Northampton, Mass. Antedated April 24, 1867.

First, I claim a lock constructed and arranged substantially as described so that the key hole can be brought to either side of the door leaving no entrance to the lock on the other,

Second, The arrangement of the two cylinders, B and K, with the key holes, e e' and g, in the manner and for the purpose substandally as described.

Third, The combination of cylinders, B and K, rack, C, pinion, H, spring, E, one or more tumblers, a a a, and bolt, A, in the manner and for the purpose substantially as set forth.

Fourth, A lock constructed and arranged substantially as described so that the key hole can be brought to either side of the door leaving entrance to the lock on the other.

64,569.—FIRE ESCAPE.—Allred Rigny, New York City.

First, I claim the flexible ladder, H, arranged in a box or case, A, so that it can be wound around a drum or roller or be straightened for use as may be desired, substantially as herein shown and described.

Second, The strap or bolt F, when arranged as described in combination with the flexible ladder, H, all made and operating substantially as herein shown and described.

Third, The springs, I I, when arranged as described in combination with the sleeves, O, and hinged side pieces, n n, all made and operating substantially as and for the purpose herein shown and described.

Fourth, A fire escape made and operating substantially as herein shown and described.

64,570.—REVERSIBLE KNOB LATCH.—Henry M. Ritter (assignor to M. Greenwood & Co.), Cincinnati, Ohio.

In the described combination with the hub, B, guiding stump, M, and spring, F, I claim the reversible latch, I J, adapted for retention to a right or left position by direct contact of its yoke, C K, with one of the wood screws employed to fasten the lock to the door, substantially as set forth.

64,571.—REVERSIBLE KNOB LATCH.—Henry M. Ritter (assignor to M. Greenwood & Co.), Cincinnati, Ohio.

I claim the reversible latch, A D, whose reversible collar, B, occupies a corresponding socket, C, and whose flat two-sided tail, G, is tangential to one of the screw holes in both positions of the latch so as as render the latter irreversible by the direct contact of the holding screw, substantially as described.

64,572.—ROTARY KNITTING MACHINE.—Mark L. Roberts, Chatsworth, Ill.

I claim, First, Actuating the needle operator through the bar, W, to which it is attached, the bar being supported in suitable bearings and receiving its movement through the medium of a vertical slotted arm, V, and a pin or stud, U, of the revolving wheel or disk, T, or its equivalent, when the whole are arranged together substantially as and for the purpose described.

Second, The needle operator, T, notched or toothed carrying bar, W, and screw nuts, A2, when all are combined together substantially as and for the purpose described.

Third, The combination of the thread puller, A3, with the looped upright, Z2, of the needle actuator, Y, the whole operating substantially as described.

Fourth, The double cam way or groove, H2, for operating the yarn presser, when connected with the same substantially in the manner and for the purpose described,

64,573.—LOOM.—Thomas Robjohn, New York City, assignor to the American Needle Loom Company.

I claim, First, In combination with a needle for carrying the weft thread through the warp in a loom, a shuttle so applied and actuated as to operate in an arc of a circle parallel to the plane of the warp that in approaching to enter the loop of the weft yarn it moves nearly parallel with and close to the selvage of the web being woven, and afterwards gradually moves away from the warp so that in completing its movement at the same time as the needle completes its retiring movement it pulls its yarn or thread tight in a direction transverse to the warp, substantially as and for the purpose herein specified.

Second, The weft retractar, Z, applied to operate on the weft, substantially as and for the purpose herein described.

Third, The arrangement of the upright shaft, M', and its crank, and eccentric in relation with the warp whereby they work the needle holder and shuttle carrier at opposite sides of the warp by direct rod connections, substantially as herein specified.

64,574.—CAR COUPLING.—Charles F. Rodrick, Lynn, Mass.

I claim, in combination with the draw bar of a railway carriage, the spring latch bars pivoted to the draw bar, as described, and recessed at their outer ends in such manner that when they are brought together the tongue of the one shall fit in the groove of the other, substantially as shown and set forth.

64,575.—MACHINE FOR WASHING HIDES.—Alexander Ross, Maine, N. Y., assignor to himself and John Fell, New York City.

I claim the wheel, A, for washing hides closed at both ends and having its sides open at various points, its interior divided into compartments, B, by close partitions, C, having ribs, D, extending in the direction of their length, the said wheel provided with hollow journals through which the washing liquid is introduced, when all are constructed and arranged to operate substantially as herein shown and described.

64,576.—CULTIVATOR.—John E. Rowland, Hagerstown, Md.

I claim the above-described cultivator, the beams, C, levers, N, and stirrup lever, M, being all arranged and combined substantially in the manner and for the purposes set forth.

64,577.—MACHINE FOR FORMING BOILERS.—E. S. Sackett, Monroe, Wis.

I claim, First, The former, A, when made substantially as herein shown and described and for the purpose set forth.

Second, The grooved and notched board, plank, or bench, B, when made substantially as herein shown and described in combination with the former, A, as and for the purpose set forth.

Third, The combination of the clamps, C, with the former, A, substantially as herein described and for the purpose set forth.

64,578.—LAMP EXTINGUISHER.—Mark Safford, Boston, Mass.

I claim so applying the extinguisher to the burner that its movements shall be actuated by the wick-elevating shaft and by the same act which raises and lowers the wick, substantially in manner and for the purpose as described.

I also claim the device for causing the above-described movement of the extinguisher consisting of the finger, h, and cam, i, applied to the shafts g and d, the extinguisher being moved in one direction by the spring, j, the whole being arranged and operating together in manner as above set forth and explained.

64,579.—CAR WHEEL.—Elnathan Sampson (assignor to himself and Edwin Chamberlin), Lansingburgh, N. Y.

I claim a railroad car wheel having the conical tread surface, c, cast with the flat tread surface, d, and with the gulding flange, f, in the manner and for the purposes substantially as herein described and set forth.

64,580.—CULTIVATOR.—J. D. Schultz and Reuben Adams, Robesonia, Pa., assignors to themselves and John McKnight.

We claim, First, The arrangement of the frame, A, with its shafts, G, arms, I I, bars, b b, and springs, a a, with rakes, d, when operated in the manner and for the purpose set forth.

Second, The elevation or depression of the frame with its cultivators by means of the bar, g, and levers, y, attached to the thill, c, in the manner, substantially as and for the purposes specified.

64,581.—MACHINE FOR CUTTING BUNGS.—John G. Schmidt, Rochester, N. Y.

I claim, First, The safety plates, o o, in connection with gage, k, screw, p, and nuts, e e, all for the purpose and in the manner herein described.

Second, The head, q, of a yielding center, b, with hole, m, the holes, m m m, in mandrel, a, and the pin, n, all for the purpose and in the manner herein described.

64,582.—CORNET, ETC.—Lewis Schreiber, New York City.

I claim the form given to the instrument as herein described by means of which the sound is discharged from the bell in an upward direction, while the weight of the instrument can rest on the shoulder of the performer, while the part to be held by the left hand and the keys are in front in position which will enable the performer to have an easy control thereof, as described.

I also claim the rotating water valve and its case in combination with and located at the lower part of the curved pipe between the mouth piece tube and the tone valve tube as and for the purpose described.

And I also claim the india-rubber segment stops attached to the inner face of the cap plate of valve cases in combination with the rotating valves, as and for the purpose described.

64,583.—MACHINE FOR CUTTING SHEET METAL.—Charles H. Schenbens (assignor to Samuel Lagowitz and Isadore Lehman), Newark, N. J.

The arrangement of the paris, a a' b, formed as shown and secured to the tool holder, C, in combination with the knife, D, constructed and operating substantially as and for the purpose described.

64,584.—METAL BENDING METAL.—Charles H. Schenbens (assignor to Samuel Lagowitz and Isadore Lehman), Newark, N. J.

I claim the additional guide rods, H, in combination with the guides, D D, in the yoke, E, and with the base plate, F, screw, C, guide, C, guides, G G, and cross head, B, of a press, A, constructed and operating substantially as and for the purpose described.

64,585.—BENDING METAL.—Charles C. Schenbens (assignor to Samuel Lagowtz and Isadore Lehman), Newark, N. J.

I claim the punch, A, composed of the side pieces or jaws, a c, and center piece, b, in combination with the die, B, constructed and operating substantially as and for the purpose set forth.

64,586.—DRY HOUSE.—Judson Schultz, Ellenville, N. Y.

I claim the arrangement in the dry house of the vertical partitions, C, having slats, F, secured to their sides extending from the second floor, D, through the roof, E, their upper ends forming chimneys, M, having dampers, N, the lower ends provided with the heat regulating doors, L, and their front sides with doors, K, opening upon the floors, D G H, etc., extending across one side of the dry house their inner ends meeting the inner edges of the partition, C, substantially as herein set forth and for the purpose specified.

64,587.—PREPARING LEATHER FOR WEAR.—George V. Sheffield and James F. Coburn, Hopkinton, Mass.

We claim the improvement in preparing leather for wear, substantially as set forth.

64,588.—BLIND SLAT FASTENING.—F. R. Smith, Bennington, Vt.

I claim the cam, D, applied to the blind frame, to serve as a fastening for the slats, substantially as herein shown and described.

64,589.—WATER-PROOF LEATHER.—Robert Sponouse, Jersey Shore, Pa.

I claim the composition specified in the process of tanning the leather and its application and use in the manufactured article, substantially in the manner and for the purpose as herein described.

64,590.—THILL COUPLING.—Luman Squire, Norwalk, Ohio.

I claim the spring arms, e e', in combination with the bolt, E, provided with the shoulders, l, semi-elliptic in its transverse section, when constructed and arranged as set forth.

64,591.—PREPARING SMOKING TOBACCO.—A. F. Stayman, Baltimore, Md.

First, I claim the process herein described of preparing tobacco for smoking.

I claim as a new article of manufacture the smoking material herein described whether composed of tobacco proper, or partially of tobacco and partially of tobacco dust combined, when prepared substantially as set forth.

64,592.—DOUBLE SHOVEL PLOW.—H. Stephens, Mount Vernon, Ohio.

I claim the combination of the shovel stocks, B B, with the horizontal brace, C and the beam, A, when the same are constructed in the form and and manner for the purpose specified.

64,593.—STEAM GENERATOR.—G. Symmes and T. W. Hayes, Brooklyn, N. Y. Antedated April 26, 1867.

First, We claim the arrangement within the fire box or chamber, of one or more series of inverted cones forming steam generators and communicating with the body of the boiler, substantially as specified.

Second, The arrangement of generators in the fire box or chamber separately connected with the water space above or body of the boiler by pipes passing through the crown sheet of said chamber and with the lower portion of the water jacket, surrounding said fire box, by pipes running through the jacket and down or around the outside thereof, essentially as shown and described.

64,594.—COMPOUND FOR MAKING ARTIFICIAL STONE AND FOR COATING STONE AND BRICKS, ETC.—Joseph Tattersall, Indianapolis, Ind.

I claim the compound herein described together with such variations as may be produced by varying the proportions of the ingredients named, substantially as and for the purposes set forth and described.

54,595.—LOCOMOTIVE AND OTHER WHEELS.—George Tefft Salem, N. Y.

I claim the employment of the wedges, C C C C, in combination with the keys, D D D D, or their equivalents operating in the manner and for the purposes substantially as herein fully described and set forth.

64,596.—PAINT AND VARNISH BRUSH.—Ellis Thayer, Worcester, Mass.

First, I claim the combination with the brush handle, bristles and ferrule for holding the same upon the handle of an elastic packing interposed between the ferrule and bristles, substantially as and for the purposes set forth.

Second, In a brush as herein described the combination with the bristles and ferrule of an interposed tube of rubber or other elastic material, extending down upon the bristles below the ferrule as and for the purposes herein specified.

64,597.—WINDOW FRAME.—John H. Thomas, Philadelphia, Pa.

I claim a side piece for a window frame consisting of two sections or strips a a' grooved and connected together, substantially as set forth for the purpose specified.

64,598.—ALARM LOCKS FOR TILLS.—Cyrus Tucker, Bloomington, Ill.

First, I claim the series of tumblers, a, having one end heavier than the other and so pivoted as to cause them to tip, in combination with a supporting head, H, arranged to hold them in a horizontal position, substantially as shown and described.

Second, The combination of the pivoted tumblers, a, constructed as described with the supports, u, and levers, E, arranged for joint operation as herein described.

64,599.—HEATING STOVE.—J. S. Van Buren, South Troy, N. Y.

First, I claim the arrangement of the hot air chambers, E' A' and J, in combination with the fire box, B.

Second, I claim the flue, D, surrounding the fire box, substantially as shown and described.

Third, I claim the jacket, C, constructed substantially as described in combination with the furnace, A, and the flue, D.

64,600.—ROTARY STEAM ENGINE.—Joseph B. Van Duesen, New York City.

First, I claim the revolving cylinder, A, constructed so that its ends rotate within recesses in the side plates of the stationary chamber, F, substantially as shown and described for the purposes specified.

Second, The arrangement of the ingress and egress ports in relation to the permanent abutment and to the revolving cylinder fitted with a single sliding piston for operation, substantially as set forth.

64,601.—WINDOW FASTENING.—Philip Verbeck, Neenah, Wis.

I claim the button, C, pivoted to the sash and having the two eccentric arms, c c', and radial thumb, piece, d, constructed and operating in such a manner that when the point of contact of the arm, c', with the jamb of the window frame is below the pivot, b, the sash is held raised, and when the point of contact of the arm, c, is above said pivot, the sash is held down as shown and described.

64,602.—COMPOSITION FOR INVIGORATING FRUIT AND FOREST TREES.—William Vermilya, Dayton, Ohio.

I claim the composition of matter formed by the mixture of the proportions of three pounds of sulphate of copper, one pound of sulphur, one ounce of saltpeter, and a half pound of iron filings, to be used as a tree invigorator and destroyer of vermin, which may be in and upon fruit and forest trees, as herein described.

64,603.—FLOUR BOLT.—J. W. Walters, Tiffin, Ohio.

First, I claim constructing the rod that actuates the hammer for a bolting reel, with a spring capacity in itself, for the purposes described and substantially as set forth.

Second, The combination of the stepped segment, E, and the spring rod, D, that actuates the hammer, with a flour-bolting reel, substantially as described.

Third, The pivoted segment, E, when constructed with steps, g, upon its point of contact with the spring rod, D, and made adjustable for the purpose described.

Fourth, The arrangement of the segment, E, with its stepped ribs in the top of the bolting reel case, substantially in the manner and for the purpose described.

64,604.—HORSE SHOE.—Christian Weitman, Hazelton, Iowa.

I claim the securing of the heel calks to a horse shoe, in the manner substantially as herein shown and described.

64,605.—PERMUTATION LOCK.—Seth Wheeler, Albany, N. Y.

First, I claim the permutation wheel in combination with a circular tumbler, an indicating dial, a sleeve, and a tooth or space for connecting the tumbler and dial, constructed and arranged substantially as and for the purposes specified.

Second, I claim a movable stud or tooth, in combination with the dial or tumbler as specified, whereby the tumbler can be placed in a greater number of positions relatively to the dial than there are teeth in the gear, as set forth.

Third, In combination with a series of tumblers, as set forth, I claim a key formed of a series of changeable or adjustable rings acting on studs or projections, as specified.

64,606.—SORGHUM EVAPORATOR.—N. H. Whisemand, Independence, Iowa.

I claim the arrangement of the sectional compartments, a, openings, C', compartments, C, and gates, E F, in combination with the section, B, and strainer, G, operating conjointly as and for the purposes set forth.

64,607.—PAINT BRUSH.—John S. White Boston, Mass.

I claim the improved paint brush, metallic cap tube, B, made in sections parts, united and readily separable, as and for the purpose as hereinbefore described.

64,608.—SLIDE FOR FASTENING ENVELOPES, POCKET BOOKS, ETC.—John W. Wilson, New York City.

I claim constructing a metal slide, a, with spurs or projections, d d, at the ends of the slots, e e, for securing envelopes, portemonnaie, or other similar articles, formed and attached in the manner substantially as herein described

64,609.—PLANING MACHINE.—A. A. Wilder, Detroit, Mich. Antedated March 5, 1867.

First, I claim the combining and arranging of cutters in a planing machine, in the manner substantially as shown and described, whereby lumber is prepared for flooring or ceiling by tongueing, grooving, and planing the same at one operation, and making two or more finished pieces of lumber out of one without the use of a saw.

Second, The self-adjusting feed level wheels, E and E', when constructed,

and operating in the manner substantially as shown and described and for the purpose set forth.

Third, The combination of the shield, r, spring, s, and roller, q, constructed and operated in the manner substantially as shown and described and for the purpose set forth.

64610.—RACK FOR WHIPS.—E. P. Willets, North Hempstead, N. Y., assignor to Edward Richmond.

First, I claim a rack for holding and suspending whips and other articles, consisting of one or more plates of wood or other suitable metal, in which a series of orifices or perforations is formed, combined with a corresponding perforated sheet of rubber or other elastic substance, and for the purposes herein set forth.

Second, In a rack for suspending whips and other articles, as described, I claim the combination with the perforated plates of wood or other suitable material, of a perforated sheet of vulcanized rubber or other elastic substance, interposed between the said plates under the arrangement herein specified, so that the whip or other article, when inserted in the orifice formed in the plate, shall be held by the elastic substance, substantially as set forth.

64,611.—MEDICAL COMPOUND.—James A. Willis, Cherry Valley, N. Y.

I claim the medical compounds, substantially as and for the purposes described.

64,612.—MOP HEAD.—John A. Wilson, Spencer, Mass.

I claim securing the mop head, H, to the endless apron, F, which passes around the upper roller, E, and lower roller G, in the mop head, A, as herein set forth for the purpose specified.

64,613.—METAL SOCKET FERRULE.—Thomas H. Windle, Westchester, Pa.

I claim in a cast metal socket ferrule for removable forks, drags, etc., the two lips, a2 a2, with the upper and the lower separate longitudinal bearings, a3 a3, each of the latter being of the same width as the shank of the fork or drag, as set forth, for the purpose of supporting the fork, and allowing its shank to be loosened with greater facility and safety in case of its becoming rusted fast, as described.

64,614.—BEER AND MASH COOLER.—C. Wise and B. Loeffler, New York City.

We claim a cooler for mash beer and other liquids, consisting of a circular stationary pan, B, in combination with a revolving shaft, D, to which the fan or fans, K, and stirrers, H, are adjustably secured, substantially as and for the purpose herein shown and described.

64,615.—HARVESTER.—David Wolf, Lebanon, Pa.

I claim the flanged extension part, L, in combination with the hinged jointed platform, H, substantially as and for the purposes described.

64,616.—WOOD-BURNING STOVE.—Gurdon G. Wolf, Troy, N. Y.

First, I claim the employment of the chamber, H, divided by means of the partition, K, containing the movable damper, C, in combination with the rear or back column flues, B, by means of which the direct and circuitous draft is had, in the manner substantially as herein described and set forth.

Second, I claim the broad bottom flue, D, in combination with the front column flues, A, and with the rear or back column flues, B, each being arranged in the manner substantially as herein described and set forth.

64,617.—HEATING AND PUDDLING FURNACE.—M. S. Ridgway, Danville, Pa., and Christopher Lewis, Harrisburg, Pa.

First, We claim the double-furnace plates for containing a body of water to preserve them and moderate the external heat, preventing the wear of bricks and the breaking of the plates by expansion or contraction, substantially as and for the purpose described.

Second, The stack constructed, in whole or in part, of water plates, substantially and for the purpose described.

Third, The door at the base of the stack, for the purpose of allowing the heater or puddler to take out the cinder and other refuse, instead of destroying the brick as is now the case, substantially as described.

Fourth, The water plates in the stock-hole frame, working door, frames, and fire plate, either or all, substantially as and for the purpose set forth.

REISSUES.

2,589.—MANUFACTURE OF INDIA RUBBER ROLLERS.—James B. Forsyth, Roxbury, Mass. Patented Nov. 13, 1866.

I claim a roller for clothes wringers and for other purposes made substantially as herein described as a new article of manufacture.

2,590.—ANIMAL TRAP.—C. Jillson, Worcester, Mass. Patented Nov. 16, 1858.

First, I claim a rat or animal trap in which the jaws are moved in a plane and parallel with each other, and which when tripped shall close up or contract the said opening, substantially as herein described and represented and for the purposes set forth.

Second, Casting or forming the piece to which the rear end of the toggle joint is hinged in an animal trap in which a toggle joint is used to set the trap by bringing the joints upon a line or nearly so with a lip or projection, m, for the purposes stated.

Third, The combination of the adjusting screw, n, with the lip or projection, m, in an animal trap, for the purposes stated.

Fourth, The combination in an animal trap of a hinged trigger, E, and hinged arm, F, with an adjusting screw to regulate the set of the trap, for the purposes stated.

2,591.—TILES AND BRICK FOR ROOFING AND OTHER PURPOSES.—Robert O. Lowrey, Tabor, Iowa. Patented Feb. 5, 1867.

First, I claim a plastic cement composed of marl or clay and sand and coal tar mixed together in suitable proportions, substantially as described.

Second, A roof composed of unglazed and unburned slabs or tiles which are secured firmly down upon the rooting boards and then covered with a cement consisting of marl or clay and sand and coal tar, substantially as described.

2,592.—PAINT CAN.—Herman Miller, Hoboken, N. J. Patented March 26, 1867.

I claim the cover, B, which is made of wood, iron, or other suitable material, and which is screwed to the paint can, A, for the purpose of easily opening and reclosing the same, substantially as herein shown and described.

2,593.—APPARATUS FOR SUPPLYING GAS ON STEAMBOATS AND OTHER VESSELS.—N. Treadwell, New York City. Patented Sept. 25, 1866.

I claim a pumping mechanism applied between the gas holder and the burners on a boat or vessel, for taking the gas from the holder and supplying the same to the burners, substantially as set forth.

2,594.—CUTTING DEVICE FOR HARVESTERS.—C. Wheeler, Jr., Poplar Ridge, N. Y. Patented Sept. 2, 1856.

I claim in combination with the guard finger ledger plate and scolloped cutter, as described, the plate resting on the finger bar as a bearing for the rear projections of the cutter, and to give an open space between the cutter and finger bar for the passage of dirt and grit, substantially as described.

I also claim in combination with the ledger plate a guard finger having a rigid cap and an open space behind the cutters, a recess in the body of the guard extending from the point of connection of the cap with the body of the finger back to the finger, substantially as described.

I also claim the ledger plate locked with the guard finger by projections on the under side of the plate so as to prevent lateral movement, in combination with the ledge, to prevent vertical movement at its front end, substantially as described.

I also claim the combination of the ledger plate with the guard finger so as to make a finger having a slot through which the cutter vibrates that is wider vertically at its back than at its front end, and that has an enlarged opening in rear of the cutter bar for the discharge of grit, fiber, etc., substantially as described.

I also claim arching the cap of the guard finger and extending it back and uniting it to the body of the guard finger in the rear of the finger bar, so as to form an open space between it and the finger bar, for the knife bar and the rear part of the cutters to operate in, substantially as described.

2,595.—PENCIL POINT PROTECTOR.—George Merritt, New York City. Patented March 5, 1867.

First, I claim a pencil point protector made with two or more wings A1 A2, adapted to fit on the enclosed pencil M, substantially as herein specified.

Second, I claim the metal piece A A1 A2, and the spring B, adapted to operate together upon the end of an ordinary wood pencil substantially as and for the purpose herein specified.

Third, I claim the combination of a rubber eraser D, with the metallic portion so as to give the proper erasive property to the exterior and also to contribute by its contractile force to the clasping of the metallic portion upon the wood of the contained pencil substantially as herein specified.

Fourth, I claim the scolloped and flaring mouth a1 a2, on the metallic pencil point protector, substantially as herein specified.

2,596.—TANNING.—John M. Muller, Kobleskill, N. Y. Patented Nov. 14, 1865.

First, I claim a tanning ooze which is made from the ingredients herein mentioned and combined in about the proportions set forth.

Second, The combination and use of yarrow and other astringent substances for making an ooze for tanning.

Third, Subjecting stuffed or unstuffed skins or leather to the action of a steam bath substantially as described.

2,597.—MANUFACTURE OF PHOSPHORIC ACID AND PHOSPHATES FOR USE IN THE PREPARATION OF FOOD AND FOR OTHER PURPOSES.—The Rumford Chemical Works, Providence, R. I., assignees by mesne assignments of E. N. Horsford.—Patented April 22, 1856.

First, I claim the mixing in the preparation of farinaceous food, with flour of a powder or powders such as described consisting of ingredients of which phosphoric acid or acid phosphates and alkaline carbonates are the active agents for the purpose of liberating carbonic acid as described, when subjected to moisture or heat or both.

Second, The use of phosphoric acid or acid phosphates when employed with alkaline carbonates as a substitute for ferment or leaven in the preparation of farinaceous food.

DESIGNS.

2,644.—STATUETTE.—Thomas H. Dorian, Washington, D. C.

2,645.—TRADE MARK.—Martin V. B. Ferris, South Norwalk, Ct., assignor to himself and Charles E. Ferris, Attica, N. Y.

2,646.—SPOON, KNIFE, OR FORK HANDLE.—Philo B. Gilbert, New York City.

2,647 to 2,649.—COFFIN HANDLE.—C. L. Nieberg (assignor to Sargent & Co.,) New Haven, Ct. Three Cases.

2,650.—WOOD STOVE.—Lewis Rathbone, Albany, N. Y.

2,651.—COAL STOVE.—Lewis Rathbone, Albany, N. Y.

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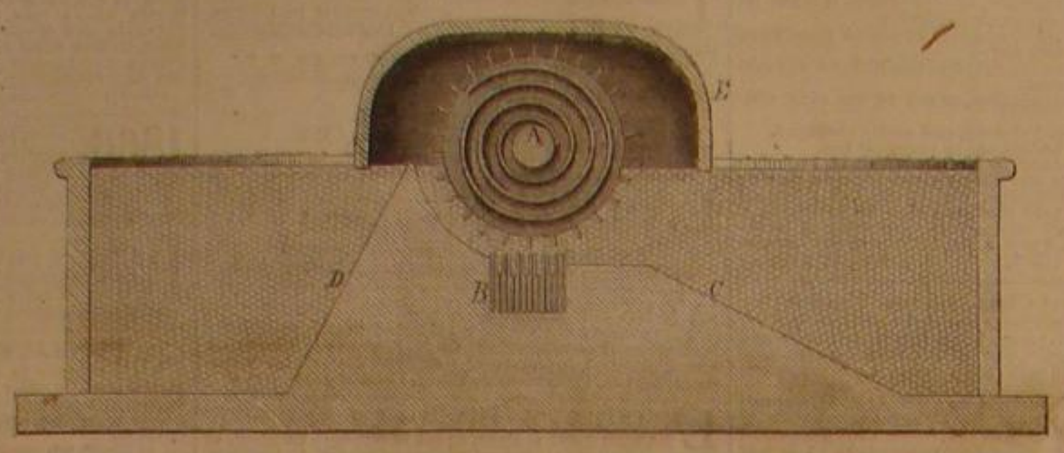
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Shew's Rag Engine.

We have seen in a paper mill the rag machine effectually clogged by the accumulation of the fibrous material around the shaft, which added to the friction to such an extent as nearly to stop the machine and cause the belts to slip and drag. The simple device shown in the engraving is intended to obviate this difficulty, and appears to be well adapted to the purpose.

The engraving is a section of an ordinary engine tank, A being the cutting cylinder and B, the box plates or stationary cutters. C is the rising incline and D the falling incline. E is the cover of the cylinder. The direction of motion of the cylinder is from C toward D. On each end of the cylinder is a volute or spiral flange the pole of which is at the shaft, A. In the rotation of the cylinder, if any portion of the rags should work in between the cylinder ends and case, E, the action of the volute would be to force it to the surface and thus keep the shaft clear at all times. It is evident this device will accomplish the object for which it is intended, and it is certain the cost of it would be very slight. It could be attached to mills already in operation as well as form a part of new built machines.



SHEW'S IMPROVEMENT ON RAG ENGINES.

A patent was obtained for this improvement through the Scientific American Patent Agency, Dec. 18 1866, by James M. Shew. Any further information desired, may be had by addressing Shew & Bellinger, Glen Rock, Pa.

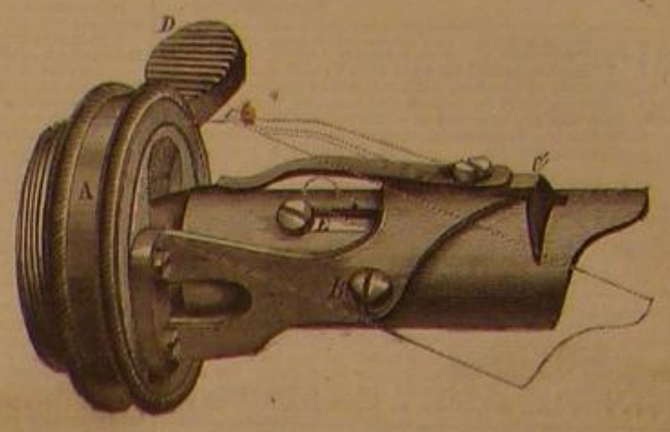
HOW RUSSIA LEATHER IS MADE.

The inimitable products of ripened manufactures in ancient seats can only be attained by other communities by first closely studying the principles and modes of operation, and then patiently practising the art until the manual "mystery," which is in all refined manufactures the greatest part, is mastered by the skill of generations of workmen. This is a difficult and not sudden success; but it is at once of the most honorable and durable kind. Some nations have more genius and disposition than others for patient excelling. Perhaps if the accomplishments of each nation could be closely examined with reference to the qualities as well as the circumstances that favor them, a clear family likeness might be traced between the parental character and its material offspring. What the Russians possess by nature specially adapting them to the production of Russia leather and sheet iron, we shall not pause to inquire; although the tanners of all Europe have done their best in vain to emulate the former product; but the communicable part of the process they pursue, is stated as follows by one who has been there to investigate it.

The best material for the red leather is goat skin, on account of its softness and smoothness; but the largest beef hides and ram's skins are also worked. The skins are first put into running water for one week, during which time they are taken out daily and thoroughly beaten with a wooden brake, a work of skill and patience, which breaks up the "nerve" and softens the fiber to a pulpy condition. Next, they spend a month in a lye made of lime or ashes, of which the exact quality, as we have no chemical description, must be left to judgment and experiment. The hair is then removed, and the alkaline properties are got rid of by soaking the skins in an infusion of white gentian in fresh water for twenty-four hours. The swelling of the skins is now a matter of particular care, for which they are soaked four or five days in a mixture of oat meal and water. They are now ready for the tannin, which is extracted from the bark of the willow. (What special virtue there may be in the Russian vegetable products employed may possibly be worth an easy inquiry.) In the first solution, the skins remain but three days, and are again beaten with the brake. The second solution, which is stronger than the first, retains them eight or ten days. They are then dried with the flesh side upward; again beaten, then greased, dyed, and finished; using logwood and alum for red, and alum and green vitriol for the dark color. The mode of dyeing is peculiar. A number of skins are sewed up into the form of a sack, closed all around except a small opening at one end to admit the dyeing liquid. They are kept in motion in the dye until it has reached all parts, and then hung up to drain. The exclusion of light and air, and the slow draining in close contact may have some importance in practice. The skins are then dried, and again dyed with a sponge. The whole process is repeated two or three times. They are next greased again on the flesh, and grained with a notched stick passing through the length and breadth of the skin until small furrows are gradually produced. After graining they are greased again, with birch or linseed oil, and put on the wooden horse to be smoothed. The birch oil contributes evidently to the undefinable characteristic odor by which Russia leather is distinguished.

DICKEY'S IMPROVED CHARGER.

The ignition of the powder and bursting of the flask with consequent injury to the sportsman, is a not unfrequent accident accompanying the use of muzzle-loading fowling pieces. A fragment of the wadding remaining in the gun may ignite the powder poured from the charger, and the flame of the explosion rush into the flask exploding the powder therein contained. If this does not occur the hand is burned, as it is held, in the act of charging, directly over the muzzle. But with the charger shown in the engraving neither the hand nor the flask is held in range of the barrel, and if the powder from the charger should prematurely explode, it will not ignite that in the flask, as the communication between the two is closed.



The charger is a tube affixed to the top of a powder flask, A, by being pivoted to a saddle support at B, which allows it to be turned to the position shown in the dotted lines. The top of the tube is closed by a cut-off, C, which is a portion of the support, B.

In using this charger it is filled in the usual manner by opening the spring slide, D, and then the end of the tube is inserted in the barrel muzzle at an angle, and the hand holding the flask depressed. This opens the cut-off, C, by the leverage of the projecting point of the tube against the inside of the muzzle which presses back the tube into the position of the dotted lines. The spring on the support, B, bears upon the inner end of the tube and returns it to place when the pressure of the hand is removed. A slide, seen at E, regulates the size of the charge.

Evidently this improvement lessens the possibility of danger in charging fowling pieces or rifles, and the device seems to be simple and durable. It was patented through the Scientific American Patent Agency, Jan. 23, 1866, by Clement C. Dickey, whom address for rights, etc., at 2,031, Chestnut street, Philadelphia, Pa.

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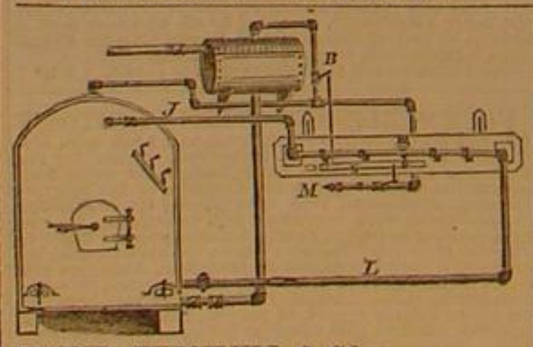
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Vol. XVI.—No. 22. [NEW SERIES.] NEW YORK, JUNE 1, 1867. $3 per Annum. [IN ADVANCE.]

Improved Hay Fork and Stacking Apparatus.

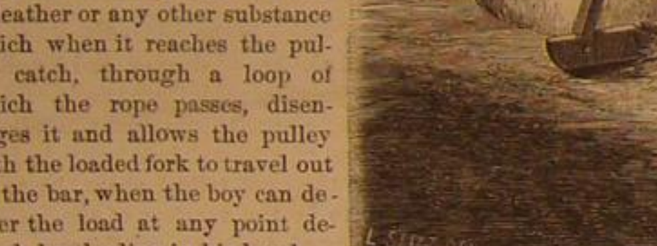
The engravings present views of an exceedingly simple and efficient contrivance for stacking hay, which will commend itself to practical farmers as at once strong, cheap, durable, and portable. When it is to be carried from place to place, the frame containing the axle on which the hoisting and draft ropes are wound is turned over into the inside of the upright frame, as it is hinged to one of the base plates; the horse power frame is placed inside the main frame, on the base plates of which are mortises to receive it, when the whole apparatus becomes rigid and compact. In this condition it can be taken through a nine feet gate. When to be used, the power frame is removed to the position represented in the engraving, sufficiently far from the uprights to give room for the passage of the horse between the two, and the axle frame is turned over, as in the engraving, when both of them are secured by two or three stakes driven into the ground.

The hay to be stacked is placed in the center of the derrick and the stack is built under the projecting bar close up to the derrick. The traveler pulley, which traverses the inclined projecting bar, has a latch attached to the pulley swivel, and while the boy is loading the fork and until it is raised to the required hight, the pulley is held by this latch engaging with a projection on the under side of the inclined bar at the point where the two longest uprights connect with the bar.

On the hoisting rope is a step of leather or any other substance which when it reaches the pulley catch, through a loop of which the rope passes, disengages it and allows the pulley with the loaded fork to travel out on the bar, when the boy can deliver the load at any point desired by the line in his hand.

The axle is of peculiar form; that portion which receives the hoisting rope is a cone while that which receives the draft rope is a cylinder. The reason for this is obvious. In starting a forkfull of hay from the mass not only the weight of the load but the adherance of it to the mass must be overcome, and therefore this conical drum, giving a greater leverage to the horse's exertions, renders this part of the work comparatively easy. The increasing diameter of the cone as the rope is wound on it increases the rapidity of raising the load.

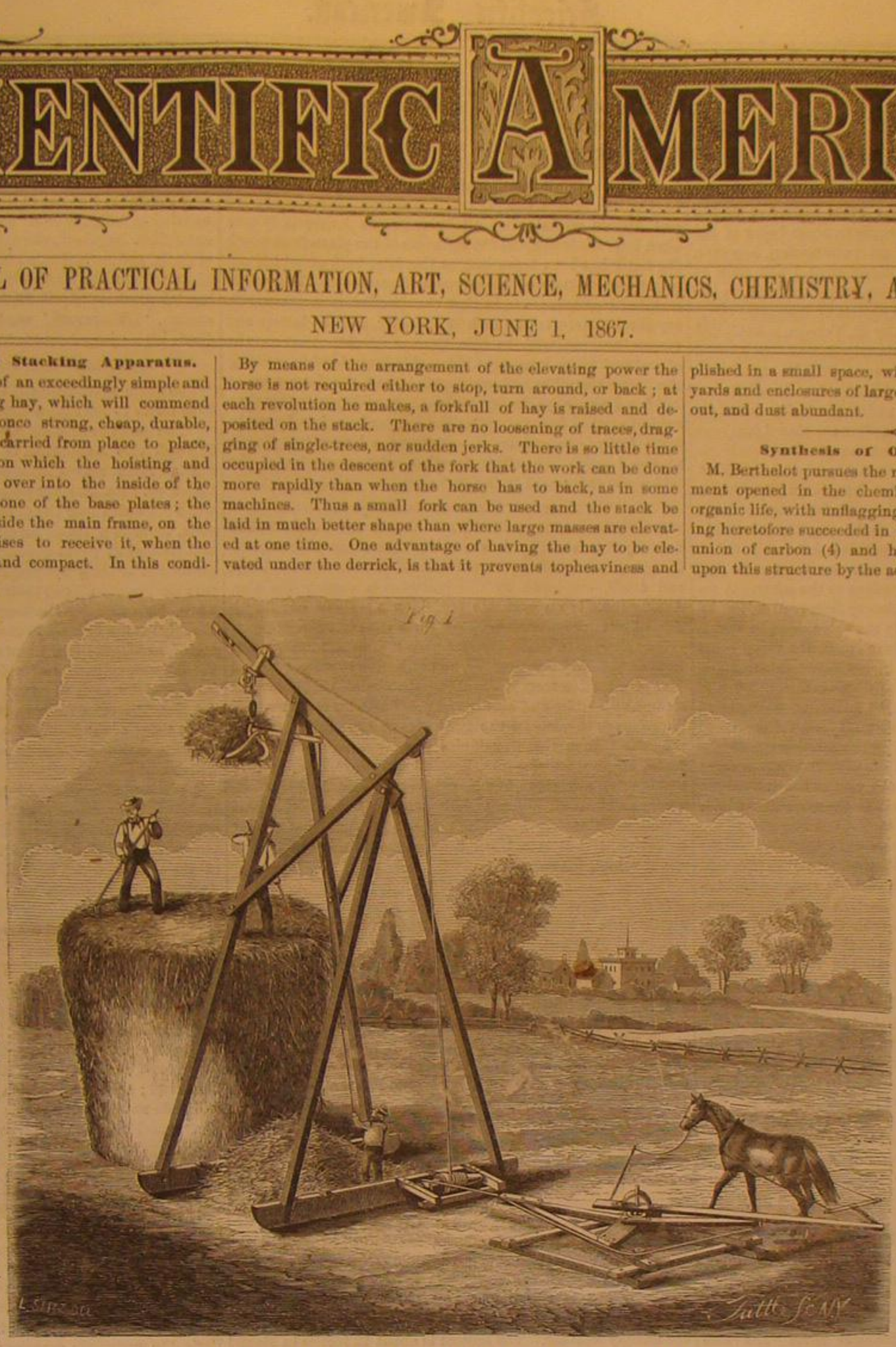
When a forkful has been delivered, the traveling pulley with the fork attached runs rapidly down the incline of the bar and catches the latch, while the fork falls to the hay beneath by its own gravity, without exertion on the part of the boy except to guide it. This gives him the same time to load the fork as the horse occupies in making a half revolution, as only on half the circuit does the horse perform any labor. This may appear improbable, but a brief description of Fig. 2 will explain it.



This figure represents the beam to which the horse is attached and the lever to which the draft rope is secured, in combination. It will be seen that the two have different centers or fulcrums. A is the beam and B the rope bar. A projection at C on the beam engages with the bar and carries it around until it arrives at a point when the long end of the beam is furthest from the derrick, when the catch slips off the end of the bar and it is drawn back by the weight of the fork, which unwinds the hoisting rope and winds up the draft rope. In both the engravings the point of release is shown as nearly reached.

The hoisting rope can be attached to any part of the cone drum to regulate the hight of raising the fork, and the stop for unlatching the traveling pulley can be moved to any point desired to accomplish the same result.

By means of the arrangement of the elevating power the horse is not required either to stop, turn around, or back; at each revolution he makes, a forkfull of hay is raised and deposited on the stack. There are no loosening of traces, dragging of single-trees, nor sudden jerks. There is so little time occupied in the descent of the fork that the work can be done more rapidly than when the horse has to back, as in some machines. Thus a small fork can be used and the stack be laid in much better shape than where large masses are elevated at one time. One advantage of having the hay to be elevated under the derrick, is that it prevents topheaviness and obviates the necessity of so heavy a frame, and as the traveling pulley is on the shortest line from derrick to stack, the fork does not need to be guided, but it is essentially self-operating. Soon as the traveling pulley is unlatched the weight of the fork swings it clear of the frame so that the hay is easily discharged. The uprights of the frame are not rigidly bolted, but connected by pivots, so that the base can be extended to admit a load of hay or contracted to pass through an ordinary gate. The elevating power can be readily applied to many uses about the farm other than stacking or loading hay or grain.



LOUDEN'S HAY FORK AND STACKING APPARATUS.

The construction of the fork seems to be an improvement on some. Its form is well adapted for retaining the hay, and being of one piece bent to form a loop for the handle, which is strongly braced to the tines, it can be cheaply manufactured.

A patent was issued Aug. 28th, 1866, to Wm. Louden, who has a patent pending for other improvements. Address him for additional particulars or for territorial rights at Fairfield, Iowa.

How Money Can Be Made.

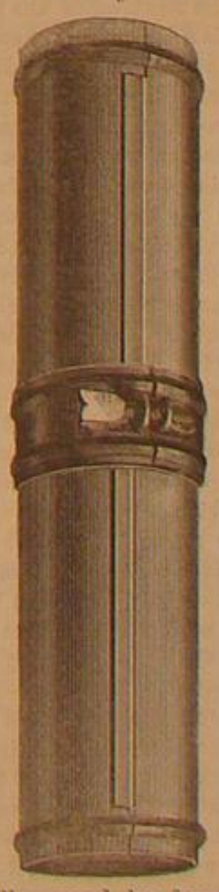
A correspondent claims that considerable money can be made by inventors who will bring forward improvements which are in urgent demand, and of which the following are a few which are suggested:—A device to admit air and light, while it excludes dust, through window and door openings. It would be well nigh invaluable in every store of fine fabrics in almost every city of the globe. To railroad cars it would add the last and much needed desideratum for that kind of travel, and suppress its most serious nuisance.—A method by which fresh meats can be preserved, similar to canned fruits, and taken to sea. Preserving meats by salting, abstracts a large part of their nutritious qualities.—A noiseless application of power to vehicles, to do away with the over-crowd of horses in the streets of large cities.—A device for heating city railroad cars, omnibusses, etc., other than by stoves. The want of warmth in these vehicles adds largely to the ill health and discomfort of citizens in this latitude.—A compact laundry machine, by which family washing and drying can be accomplished in a small space, without exposure to open air. In yards and enclosures of large cities sun light is generally shut out, and dust abundant.

Synthesis of Organic Compounds.

M. Berthelot pursues the new and wonderful line of achievement opened in the chemical creation of the products of organic life, with unflagging zeal and steady progress. Having heretofore succeeded in forming acetylene by the direct union of carbon (4) and hydrogen (2), he has lately built upon this structure by the addition of oxygen (8) which makes the exact constitution of oxalic acid, and that substance is the actual result. Other carbides of hydrogen are oxidized with the same success, giving a variety of appropriate products. The coal tar products have been proved to consist of a small number of relatively simple bodies, and the great variety of these products to be due to the various combinations which these take on under the influence of heat. In this manner acetylene is artificially condensed into benzine, its equivalents of carbon and hydrogen respectively, being exactly tripled. With an addition of hydrogen under the same influence, it forms ethylene: ethylene with benzine forms styrolene: and again, styrolene with more ethylene gives naphthaline. It is reasonable therefore to conclude that the distillation of coal produces these substances in the same way. M. Berthelot's latest success has been the synthesis of toluene, the base of the new and rich toluen red, which we noted not long since. The composition of this substance (carbon 14, hydrogen 8) indicates the addition of marsh gas (carbon 2, hydrogen 4) to benzine (carbon 12, hydrogen 6) with the elimination of two equivalents of hydrogen. Means adopted to realize this combination, resulted in the successful production of toluen from marsh gas and benzine.

PILLSBURY AND MILLIKEN'S STOVE-PIPE FASTENER.

Where long lengths of stove-pipe are used, it is not uncommon to rivet the joints between the sections to secure rigidity and permanency. But in taking down funnel to clean and in putting it up again, these long sections are unhandy and cumbersome.



The engraving shows a simple means of connecting the sections of pipe and rendering them sufficiently rigid, at the same time that they are capable of being easily separated when desired. A band of sheet iron is beaded at its edges to correspond with the beads on the ends of the sections. It is rolled to fit the exterior of the pipe, and at the two ends are riveted ears, one of which has a threaded hole for the reception of a thumb screw which passes through a hole in the other ear. By unscrewing the screw the band is expanded sufficiently to receive the ends of the sections, and then by screwing up, the annular spaces on the band engage with the beads on the sections and bind the two firmly together. This must be a valuable device for our moving populations, annually cursed by forced re-establishment of their household gods.

It was patented through the Scientific American Patent Agency, May 7, 1867, by O. M. Pillsbury, and D. L. Milliken the latter of whom may be addressed at Brattleboro, Vt.

[From our Foreign Correspondent.]

VARIETIES OF THE EXPOSITION.

PARIS, April 30, 1864.

LOCOMOTIVES.

The collection of locomotives is perhaps the most remarkable feature of the Exhibition, not only from the large number which have been sent, but from the great variety of design which exists among the different engines, some being of the most remarkable construction. Lest your readers, however, should become weary of this one department, I will refer to but one or two engines in this letter, and then pass to the consideration of some of the other objects of interest.

A tank engine from Liege, built by M. Vaissen, is exhibited in the Belgian annex. It has outside cylinders and six coupled wheels of 4 feet 3 inches diameter, and a Bissell bogie with wheels 2 feet 7½ inches diameter. The fixed center of the radial arm of the bogie is directly under the buffer beam, instead of back of the truck. The cylinders are placed just over the forward wheels of the bogie, and therefore are considerably inclined. The steam chests are on top of the cylinders, and the valve gear employed is that known in Belgium as Walschaert's. Instead of the usual eccentrics a single return crank is employed, set exactly at right angles to the main crank, and the motion obtained from this is communicated to one end of a curved link vibrating on a fixed center, so that one end has exactly the opposite motion to the other. A radius rod works in this as in a stationary link motion, but instead of being connected directly to the valve stem, in which case, from the position of the return crank, the valve could have no lead, it is connected a few inches below this to a vertical vibrating arm, the upper end of which is attached to and supported by the valve stem, and the lower end is connected by a link to an arm projecting downward from the crosshead of the piston rod. This intermediate connection causes the valve to be in advance or arrear of its central position when the piston is at each end of its stroke, and as the inclination of this intermediate lever will always be the same at the ends of the stroke, in whatever portion of the link the end of the radius rod may be situated, it follows that the lead of the valve will be varied by shifting the radius rod in the link. This arrangement therefore gives a variable cut-off, very similar to that of a link motion with constant lead. As the motion of the valve is in a measure controlled by that of the piston, instead of that of the crank as in the case of any eccentric valve gear, the ordinary inequality in the cut-off is to some extent avoided, though not more effectively than may be done by a properly proportioned link motion, and it has the disadvantage of a greater complexity of parts than the latter gear. It is, however, used to some extent on the continent. The draw bar of this engine instead of being fastened beneath the foot plate, is carried forward to a point near the forward pair of coupled wheels, and is allowed to vibrate laterally where it passes out beneath the foot plate. As it is necessary to bend this bar downward beneath the engine, the curved portion is forged in the form of a truss to give the requisite stiffness. The after pair of wheels is situated beneath the fire box, which is shallow enough to admit of this arrangement.

The English locomotives, though presenting little that is novel in design, correctly represent the excellent workmanship and simplicity of construction of the British makers. After examining the often extravagant machines of many of the continental builders, one returns with pleasure to these beautiful examples of sound mechanical ideas. The same encomium is due to the American engine also, which can not fail to be admired for the accessibility of its parts, and the direct manner in which all the strains are transmitted and sustained.

ENGLISH POSTAL CARS—CATCHING AND DROPPING THE MAILS.

In the English department is exhibited a very interesting collection of objects illustrative of the working of the post-office in that country. Among these is a beautifully executed model of a traveling post-office, representing in detail all the fittings with which these are furnished. It consists of three vans coupled closely together, and having a leather connection between them, giving a free passage way from one to another. The two end vans are furnished with boxes for assorting the letters, as mentioned in my letter some weeks since describing the general working of this system: one being for the through mails and the other for letters between intermediate stations. The middle van is used for catching and delivering the mails and also contains the bags for the large cities, Liverpool, Manchester, etc. The apparatus for receiving the mails when the train is in motion at full speed consists of a frame work of iron outside of a window of the apparatus van, carrying a stout network of leather forming the bottom, sides and one end of a strong but yielding receptacle. Diagonally across the top of this are drawn two stout cords united in the middle. By the side of the road are erected iron posts with overhanging tops reaching to just the proper distance from the train, and on this, by means of a simple spring catch, are hung the mail bags. These are suspended in such a manner that as the train passes by the long coupling by which the bag is attached to the posts is caught in the V-shaped loop formed by the diagonal cords just mentioned, and jerked away from the post, the bag being caught immediately in the network receptacle, whence it is taken through the window into the van. The mails are deposited in a similar manner, being hung for this purpose on a jointed arm on the side of the van, a counter-weight being attached by a cord to the arm, so that as soon as the weight of the bag is removed the arm flies up against the side of the van and is out of the way. The use of this apparatus enables mails to be taken up and deposited at all the towns along the route without slackening the speed at all, and without risk of accident.

The various stamps used for marking the date and name of the office on letters, and for canceling the postage stamp, are also shown. One of these is a self-inking machine with separate dies for canceling and dating, so that the latter is always legible. I think it worth while to remark here the fact that on English letters the postmark is always perfectly distinct and legible, while as we all know on our letters it is very often impossible to make out the name of the place from which the letter has been forwarded, or the date, both of which are sometimes matters of considerable importance. The whole secret of this appears to be that the English dies are small, say three quarters of an inch in diameter, and the letters and figures are cut with as thin lines as possible: ours on the other hand are so large that if one side bears hard in striking the letter the other will not touch it, and the letters are so full faced as always to be blurred. In addition to this they exhibit a set of books showing the forms of receipts for registered letters, the manner of assorting the letters into classes at the London Post-Office, together with examples of the tables and taxes used in the operation.

AMERICAN SANITARY COMMISSION.

A very interesting exhibition is that of the United States Sanitary Commission. In one of the numerous buildings in the grounds are collected specimens of various articles, large and small, employed by the commission during the war. Among these is an accurate model, on a scale of one fourth size, of a large hospital car, with three tiers of beds, hung on rubber rings. In general appearance it does not differ much from an ordinary sleeping car, and it seems to attract a good deal of attention from visitors. There are also specimens of canned vegetables and meats, and other articles of diet which did so much to mitigate the hardships of our soldiers during the war. Then there examples of ambulances of different forms, surgical instruments, hospital furniture, camp chests, and cooking apparatus, besides articles of clothing—the whole a very creditable exhibition of our ingenuity and skill in this direction. The French are also preparing a somewhat similar collection, but it is not yet near enough to completion to afford subject for remark.

MILITARY.

In another building is a display of guns and armor plate, all English, I believe, except a case of revolvers from Colt's factory at Hartford. An Armstrong 9-inch muzzle loader weighing 27,957 lbs. is mounted on its carriage behind a wooden shield representing the side of an iron-clad broadside vessel. Mr. Whitworth has five guns of smaller size, unmounted, but representing very well his system of construction Then there is a 9-inch rifled gun made on Major Palliser's principle at Sir Wm. Armstrong's works. He uses a coiled tube for the bore and pours around this a thick casing of cast iron, in shape somewhat like our guns. The weight of this is 30,009 lbs. A 20-inch or even a 15-inch gun from the United States would have been an interesting addition to this collection, but our system of cast-iron ordnance is not represented in the exhibition. Messrs. John Brown & Co. exhibit several specimens of armor plate from 13½ inches thickness down to 4 inches. The largest is a plate 6 inches thick, 42 inches wide and over 30 feet long, weighing 11 tuns, 5 cwt. With this are exhibited shavings planed off from the edges of the plate, showing the toughness of the iron. The same makers also exhibit some large steel gun barrels forged hollow on Deakin & Johnson's patent, with which your readers are already familiar. The largest is about 13 inches in diameter, the central hole being about 6½ inches, left as forged, and the length is 10 feet. SLADE.

TRIAL OF STEAM FIRE ENGINES.

The Engineer, under date of April 26th, says:—

"A trial of the steam fire engines in the Exhibition took place in the Champ de Mars on Tuesday and Wednesday last. The following were the exact times made:—Shand & Mason: 20 lb. steam in ten min.; 49 lb. in 13 min.; 60 lb. in 14½ min.; started. Merryweather's; 20 lb. in 9½ min.; 60 lb. in 11 min.; 80 lb. in 12½ min.; and started, rising steadily afterwards to 150 lb. The hight of both jets at full power was about 120ft., as observed on the Great Lighthouse, beside which the trial took place. Inch jets were used by both engines. In the evening Shand & Mason's large engine, Le Rhone, was tested against the French one made at the 'Océan' workshops, Havre, on Lee & Larned's (American) system. The latter altogether failed to keep steam, and was never able to pump with more than 1¼ in. jet, whilst the Rhone's two jets of the same diameter always surpassed it in hight. On Wednesday the French engine was again at work beside the river, and apparently getting on much better than the day before, but it did not venture to place itself beside Messrs. Merryweather's large double-cylinder, l'Empereur, which for some hours continued to throw a 1¾in. jet up to and even 10ft. over the gallery of the Great Lighthouse. The hight thus attained was from 170ft. to 180ft.

The *Mechanics' Magazine* says:

The trials were made and strictly conducted by the jury of class fifty-three, and they principally rested with the engines of Messrs. Merryweather & Sons and those of Messrs. Shand & Mason; for, although there was another engine present, made by M. Mazaline, of Havre, on the duplex system of Lea & Larned, of New York, for some reason unassigned, but little work was got from it. The three steam fire engines exhibited by Messrs. Merryweather have horizontal cylinders and pumps, two being single and having 18in. stroke of piston, and the other double cylinder with 24in. stroke of piston, made on the makers' well known system, without cranks eccentrics, or flywheels. The two engines of Messrs. Shand & Mason were a vertical and a double and horizontal engine, both with cranks and flywheels. The boilers of Messrs. Merryweather's engines are constructed on the well-known "Field" principle. Messrs. Shand & Mason's large engine was set to work, but from some unexplained cause did not act as well as was expected. Messrs. Merryweather's large engine, which had at mid-day just arrived from Billancourt, where it had been taken through some blundering of the railway company, was not in time to be worked. It will probably be tried in a day or two. Besides the jurors, there were present Prince Napoleon, the Colonel of the Sappeurs Pompiers of Paris, and several other influential and scientific gentlemen. Since writing the above report we have received the following telegram:—"April 24, Merryweather's large steam fire-engine, 'L'Empereur,' worked alone to-day. Threw water 220ft. high; jury delighted."

CONTRASTS OF THE AMERICAN DEPARTMENT, ETC.

The Paris correspondent of the New York *Times*, April 26, thus refers to American topics at the Exibition;—

"The most prominent thought in one's mind as he passes through this Exhibition, is that everybody should know so much. Each nation must be astonished at the knowledge of the other. An inventor puts up a machine at great cost, and when he walks into the division of another nation across the aisle, he finds a better invention for the same purpose. Certain nations at great expense have sent whole categories of goods, not to show the progress they have made, but to compete for premiums, and their collections are miserable failures. Thus, for example, the Germans have had the courage and the misfortune to send to the Exhibition a considerable number of carriages; and when one passes from the French into the German collection of vehicles, it is like passing into a *salon des refusés*, such as the French used to have at their annual Art Exhibition. Of course, in these striking contrasts lie the great value of the Exhibition, for by them workmen learn to estimate each other, and to measure the distance in perfection which separates them.

A circumstance which has not been remarked upon, because it happened naturally and without pre-arrangement, is the conformity in form, color and costliness of the different temporary constructions of the Exhibition to the characteristics of the nation which put them up. Thus the English and American departments are plain in form, with no surplus decorations, and absolutely without method as to color. Their departments correspond more nearly to the Exhibition building itself than the others, because it is the nut and not the envelope they look after. The French section is both showy and solid, and especially in good taste.

But the most remarkable differences are to be seen in the constructions of the Park. There the French constructions are light, graceful and inviting; the English heavy, solid and useful, and not at all decorative. The African and Oriental here excel; the nations which never invented anything useful, which do not exhibit a single idea in the way of human progress, excel in their exhibition of mosques, and temples, and gentlemen's country houses.

The American department, which is the poorest looking in the Exhibition, because of all absence of display, and because the articles exhibited are all practical; this department, which some of our own country people have stigmatized as a failure and as a disgraceful exhibition of national inferiority, is just now the most frequented and the most talked about, because we already know what are to be the verdicts of the juries, and these verdicts are in favor of American exhibitors. For example, to the surprise and the shame and the horror of all Paris, the unartistic savages of the New World will take the Grand Medal for musical instruments, in the person of Mr. Steinway, of New York City—an event which has astonished the Parisians more than if the Prussians were to march up the Boulevard this afternoon, with Bismarck at their head! So, too, the American brass musical instruments, on account of their revolving "hair-trigger" valves, will also take the principal prize in their department. And yet the Americans show but half a dozen pianos against several hundred out of the best shops of Europe, and but half a dozen brass wind instruments against several ship loads from other nations! And so on of many other things.

By the first of May the Exhibition will be completed; all the boxes will be opened, all the goods put in place, and the last of the dirt cleared away. Last Sunday 48,000 persons were admitted at a franc a head, and the day after 68,000. Thus the Exhibition made in two days $28,000. But these were *fête* days, and consequently exceptional days. Nevertheless there are many other days to come when the receipts will be equally large.

Exposition Notes.

THE FIRST EXPOSITION was made under Nero, more than 18 centuries ago, and is referred to in a letter by Seneca, as "a solemn exhibition of the riches of Rome," containing miscellaneous works of art, and exquisite fabrics even from beyond the limits of the Roman Empire.

A CHIME of 42 bells, to be placed in the Exposition, is played like a pianoforte with perfect ease, to any tune. Four years were spent in the construction of the instrument.

THE STEEL BRIDGE of the Quay D'Orsay, near the Exposition building,—the first of the kind yet built—is said to be a failure, having already sustained a deflection of at least three inches in the center.

OPERATIVE'S TENEMENTS are exhibited on four different plans, from as many as four different seats of French industry. M. Jean Dollfus, the philanthropic cotton-spinner of Mulhouse, exhibits a block of four costing about $545 each; the Blanzy Coal Mines, a style costing $485, of which they have built 679 and their miners themselves, 99. The Co-operative Society, a style costing $582: and Messrs. Japy Frères of

Beaucort, Alsace, makers of clocks, watches, sewing machines and other small wares, exhibit what is spoken of as the best house in the lot, though costing only $388, and allowed to become the property of the tenant at the end of eleven years, by the weekly payment of about $3.90.

HOWARD'S TRACTION ENGINES.—J. Howard & Co's traction engine for agricultural purposes and double plowing, exhibited at Paris, is an exceedingly substantial machine. The boiler is placed transversely, the better to keep the fire and water level while going up and down hill. The barrel of the boiler is 6 feet long by 3 feet 4½ inches in diameter, the two cylinders are 8 inches diameter and 12 inches stroke, and the crank shaft is 3½ inches diameter. The foot plate is very roomy, measuring 5x3½ feet. The test of every machine before sending it out, is to drive it repeatedly at full speed over large logs, 8 or 10 inches square, in a graveled yard. The engine will turn completely around in little more than its length, which is 19½ feet over all, will haul a load of from 20 to 30 tuns on a good road, and will ascend an incline of one foot in six with ease.

THE EXPOSITION PALACE has been insured by the Imperial Commissioners in the International Assurance Company for the sum of seven and a half million francs.

Editorial Summary.

COLORING OF ZINC PLATES.—A variety of beautiful colors, corresponding to those of the rainbow, can be imparted to zinc surfaces, by a simple chemical application continued a length of time proper for the desired color. It is necessary that the metal be pure, and especially free from lead. It is therefore to be rubbed with siliceous sand moistened with hydrochloric acid, then dipped in water and rubbed vigorously with blotting paper. The zinc is then immersed in a solution of three parts by weight of dry tartrate of copper in four parts caustic soda, with forty-eight parts distilled water, the whole at a temperature of about 50° Fah. The colors will appear successively, in the prismatic order, according to the period of immersion. In two minutes, the violet will appear; in three, dark blue; in four and a half a golden yellow; in eight and a half a red purple. Intermediate terms give intermediate tints. When colored, the zinc is well washed with water, and for greater permanence of color may be varnished.

DARNING MACHINE.—It would be singular if the first darning machine should be an English invention, but it will be more singular if some Yankee does not take up the idea and improve upon it. The method recently patented by Mr. E. A. Cowper of London, consists substantially in the use of a small rectangular frame, large enough to enclose any hole to be darned, and notched all around its outside like a saw, upon which darning cotton is wound in two directions crossing each other, one thread in each notch, and thus at uniform intervals. The network thus formed is applied to the hole, the article is stretched upon the frame and held by its teeth, and then the apparatus is placed beneath the needle of a sewing machine adapted to make stitches enveloping and clasping the threads at their intersections, and filling the space with a firm and neat texture. When done, the frame is cut away and the ends of yarn trimmed close with the scissors.

ANOTHER MODE OF TANNING.—The hides are suspended vertically, in alternation with cloths, in a vat filled with the tanning liquor and containing something like false sides which are made to approach each other (after the skins are soaked) so as to squeeze out of them the spent liquor which has already given its tannic acid to the gelatine of the hide. By the removal of the pressure, fresh liquor is admitted to the pack, absorbed, exhausted of tannin, and again expelled by the press: the operation being repeated until the hides are entirely converted to leather, which is accomplished in a week or ten days. Calfskins are suspended to the spokes of a horizontal wheel, revolving in a tub of liquor, and sweeping them through it, broadside on, so as to produce the rapid exchange of exhausted for fresh liquor which is desired. The lightest skins are thus tanned in 12 to 24 hours; others in two to four days.

TRICHINÆ.—It did not occur to us as necessary to remark—what the inquiry of a subscriber requires in reply—that trichinized pork is supposed to be rendered harmless by being thoroughly cooked. Eating it in that condition becomes a mere matter of taste—not of life and death. But it is never safe to eat pork, no matter how thoroughly salted, pickled or smoked, unless it is thoroughly cooked, leaving no spot "rare." The best looking pork has proved trichinous; and if salted, pickled or smoked, the raw color and taste by which we usually detect imperfectly cooked meat are so much disguised that only extreme care on the part of the cook can be a protection, unless we take security by rejecting all ham, bacon etc., that is not *over*done.

CHINA.—The telegraph and express line is now open from London to Tien-tsin (the port of Pekin) dispatches passing in twelve days. The Chinamen don't telegraph much yet, however, and they are bitterly opposed to railroads as well. The enterprising gentleman who has for two years expended so much effort to introduce the telegraph, has given it up in despair of any efficient protection to the lines against the hostile prejudice and perfect thievishness of the dense and densely ignorant population. He has gone, we believe, to Japan, with much fairer prospects of success. Arrangements have indeed been already made to lay a submarine cable between Yeddo and Yokohama, and land lines to the interior will follow.

THE CONVERTIBILITY OF ELECTRICITY AND HEAT is illustrated by joining a bar of antimony and another of bismuth, end to end, and passing a current of electricity through them, first from the one end and then from the other. The current passing from the antimony to the bismuth will be found, by proper tests, to part with a portion of its electrical intensity at the junction, and to develope increased heat. That passing from the bismuth, on the contrary, will manifest increased electrical tension, evidently at the expense of the pre-existing heat, for the bar at that point will be colder than before the current passed. The same principle has been applied by General Morin, so as to produce a self-registering electrical thermometer. A thermo-electric battery—developing electricity by the application of heat—is arranged with one extremity of the pile in a medium of uniform and low temperature (ice) and the other in the medium the temperature of which is to be measured. A needle is magnetized by the thermo-electric current produced by this temperature, and its consequent deflection from a certain natural position is registered by punctures made by it in a dial of paper which is caused by clock work to complete a revolution in twenty-four hours, and also to rise to meet the puncturing point at equal intervals, hours, half hours, etc., as may be desired. The punctures made at the several hours will indicate by their variation from a circle, the changes of temperature throughout the day.

A NEW MARINE VOLCANO is reported near Navigator's Isles, inaugurated with a violent earthquake shock on the 5th of September last, after which dense smoke and lava were thrown up from the ocean in vast quantities, and continued without abatement when heard from about the middle of November. It has been impossible, of course, to approach or examine the forming island, and probably will be so for some time to come, as a vast volume of stifling smoke and steam and a turbulent sea extend to a great distance around. If the demonstration "succeeds," a new volcanic island will be talked of in future geographies, and ages hence may be a green and smiling abode of men.

CHARCOAL.—The interesting mystery of the power of charcoal to absorb, condense and change gases to vapors, engages continued investigation. Among the latest observations reported, the remarkable chemical activity in charcoal saturated with oxygen is displayed in the conversion of moist sulphurous acid and sulphuretted hydrogen to sulphuric acid; common alcohol to acetic acid, and amylic alcohol to valerianic acid; indicating a power of oxidation extending to a very wide range of effects, but to which ammonia showed an exception. The condition in which oxygen exists so largely and actively in charcoal is yet a mystery.

THE LYCEUM OF NATURAL HISTORY of Williams College, is fitting out an expedition to visit South America, with the intention of making a special study of the volcanic region about Quito. The company is composed of twelve select members of the Society and is under the charge of Professor Jas. Orton, a graduate of Williams College, but now of the University of Rochester. The proposed route is from this city, *via* Panama to Gauyaquil, thence to Quito. Upon finishing their exploration in Ecuador their present plan is to proceed to Peru and descend the Amazon. The estimated expense is $15,000 which will be defrayed by the friends of the College.

LUCINE OR GLUTEN FOR FASTENING COLORS, as a substitute for whites of eggs, is dissolved in alkaline or acid solutions. The best acid is acetic; the best alkali, lime dissolved in sugared water or ammonia. The difficulty is to get a sufficient proportion of the gluten incorporated with the coloring matter. To effect this, soaked gluten is mixed with ammonia or exposed to its vapor, and after a few days will liquefy and assume the consistence of a good thickener of colors. With ammonia and sucrate of lime, the compound becomes capable of resisting soap.

WHITWORTH'S NEW CARTRIDGE.—Mr. Whitworth's improvement lately patented, consists in a cylindrical space formed by a thin perforated copper tube running lengthwise through the cartridge, and containing a priming by which the powder is fired, either at the end or by a branch tube near the center. The length of the cartridge of a given weight is thus increased, giving a large bearing surface and distributing the strain. The powder is also ignited more nearly simultaneously and instantaneously, and the explosion of the priming itself gives the initial start to the shot.

SWEDISH GREAT CAST GUNS.—A large rifle gun of twenty tuns, 10·58 inches caliber, has been cast for the Danish Government at the Finspong gun foundery in Sweden, and tested with 234 heavy charges, with the most satisfactory results as to accuracy and endurance. The charges used were from 44 to 55 pounds of powder and from 450 to 468 lb. shells. The breech is strengthened externally with two concentric layers of French puddled steel coils, shrunk on, and extending a little forward of the trunions which form part of them.

A BEAUTIFUL NEW PORCELAIN GLAZE.—A double chloride of platinum and aluminium, obtained by dissolving the metals together in *aqua regia* (nitro-muriatic acid) is mixed with fine ground Limoges glaze, (a potash alumina glass) as well as with other enamels, producing a variety of beautiful effects. The first named gives a remarkable metallic luster and iridescence in the enamel.

TUBE SHOT AND SHELL.—Captain Scott has patented an improvement facilitating the manufacture of elongated steel shot and shell, by drawing steel tubes with projecting ribs to fit the rifle of the gun, to be cut up into proper lengths, and closed either by upsetting the ends with a hammer, or by welding or screwing on points and backs made and tempered separately.

CHARRED WOOD is inflammable in proportion to the lowness of the temperature at which it has been reduced. For gunpowder, the charcoal is made very slowly, at a low temperature, and consequently has a very low igniting point, requiring great care to prevent its igniting spontaneously. It is said that by taking years for the process, at a proportionally low heat, the dried and shrunken fiber, penetrated everywhere by air, will ignite at a temperature not far above that of boiling water. A charcoal sufficiently inflammable to be readily ignited by burning paper or shavings, would be a great domestic convenience for lighting anthracite coals, instead of kindling wood. Ordinary charcoal is retailed probably as low as kindling wood, for equal amounts of heating power; and the cost of slow charring, with cheap fuel and chemical aid, on a large scale, could hardly be more, while there would be a saving in freight, and a great advantage in the prompt efficiency of the article.

SWEDISH IRON.—There are 500 iron mines in Sweden, which yielded in 1864 half a million tuns of ore. All the ore is smelted with wood charcoal, and all refining processes are carried on with the same fuel, and with remarkable care and attention. With but the smallest traces of sulphur, and scarce a trace of the worst of all impurities, phosphorus, it is not strange that such ores, such fuel, and such pains, should produce a famous iron. Very little bar iron is manufactured, however, the annual product never having exceeded 200 tuns to 300,000 tuns of pig. About 5,000 tuns of plates are made for ship building. The Bessemer process has been introduced about five years, and produced in 1864 some 3,200 tuns. The amount of cast steel produced at the same time was 4,500 tuns.

SOUTHERN CORRESPONDENTS aver that improved culture of the soil encounters, as might be expected, obstinate prejudice on the part of the negroes. Deep plowing "kills the land." Concentrated chemical fertilizers, applied by mere handfuls, are "no account," and nothing but close personal attention from the manager can secure their being really employed. A few years of experience and observation will be required to implant the rudiments of scientific agriculture in their untaught minds. Among the white farmers, however, considering the impoverished condition of the country, the amount of improved implements and manures demanded is remarkable.

NAPOLEON'S CANNON is under trial at Vincennes in profound secresy, trusted officers alone being allowed to handle it, without the aid of soldiers. It is a copper piece of small caliber, said to make 12 to 15 discharges per minute, on the principle of the needle gun. Another report—hardly worth repeating—says it is discharged 40 or 50 times a minute, carries with accuracy 2,000 yards, and would destroy the whole front of a battalion at a single fire. The only hint—if it be so much—given of its construction, says that it is operated by "a series of metallic disks and a tourniquet."

ANOTHER PAPER MATERIAL.—Successful experiments are said to have been made latterly in France on the Lucerne root, which was tried for paper, as well as twine and ropes, some ten years ago. The fiber is strong, and it is said to yield 56 per cent of pulp, or a larger proportion than straw. It is treated in the same way. The paper now produced is described as very soft, white and beautiful.

THE popular opinion is that editorial assistance is dirt cheap—but we never knew a lower bid than one made to us the other day of "one glass of soda water" for a notice of the re-open, ing of a saloon. We respectfully decline. The ticket with the name and "compliments" of the proprietor printed thereon, is for sale. Price 5 cents.

MISCELLANEOUS.—In working an old slate quarry closed a hundred years ago, on the estate of Ballachulish, says the Oban *Times*, the workmen came the other day upon an old bore closed with a wooden plug, and containing gunpowder in a position which it was thought had not been disturbed for 150 years. On drying, the powder was found as explosive as ever.——Stone is now sawed in France with great rapidity and economy by means of a perforated disk of iron, on which a coating of lead has been cast, the perforations serving to connect and bind the plates of lead thus formed on the two sides of the disk. The lead is kept well covered with emery, which falls on it from a reservoir above.——Mount Baker, Or. is in active eruption from its southern peak, near the summit. The Indians say that this mountain about thirty years ago, as nearly as they can compute, was a volcano.——No sooner had the news been received of the ratification of the Russian treaty, than arrangements were made to put on a line of steamships between San Francisco, New Archangel, and Sitka, stopping at Victoria. The California, Oregon and Mexico Steamship Company's steamer *Oriflamme* is advertised to sail for the above ports on the 1st of June and will probably have a full cargo and list of passengers.——Hardwood timber, it is said, should be cut in late autumn and early winter, when least sap is in the veins, in order to retain its toughness, solidity and durability.——The undertakers of a certain district in France are on a strike. Their customers would like to join in a counter strike——By the London Lloyds report for 1866, it appears that accidents happened to 11,711 vessels, more than half in January, February, March and December. Of these, 98 vessels are still missing, 341 abandoned, 1958 collisions, (492 without material injury) 530 foundered, 3381 stranded (of which 1,672 were got off) 171 fires, 2,234 involved total loss of the ship, 1946 total loss of cargo, lives lost 2644.——There are 3,241 newspapers published in Europe in the German language.

Combined Table, Cupboard and Clothes Rack.

Inventive genius in this country has been for some years largely directed to contriving new appliances to lighten household labors and to increase the conveniences for the housewife's use. The piece of furniture represented in the accompanying engravings is a remarkable combination of table, cupboard, chest of drawers, clothes rack, etc., and is quite an ingenious contrivance.

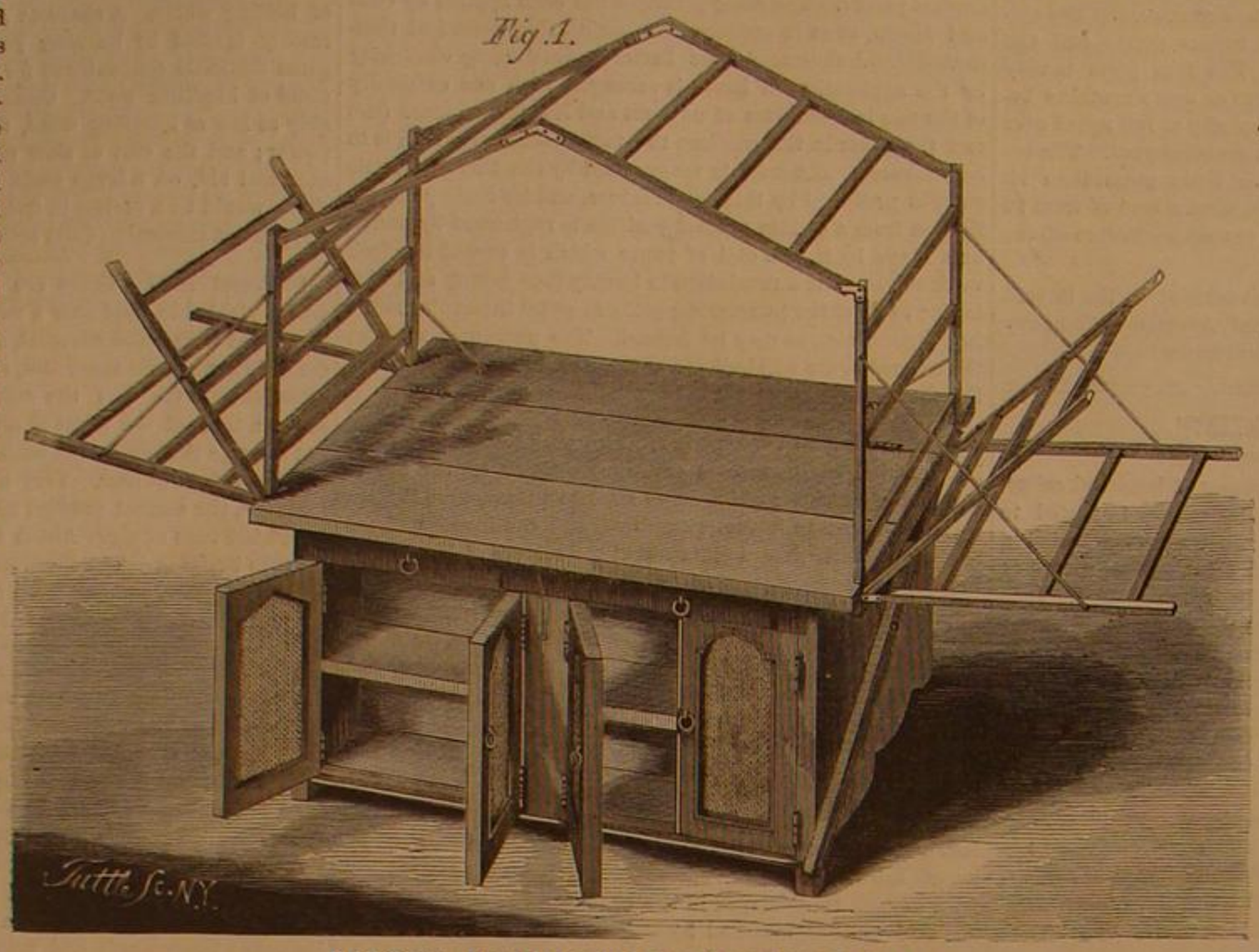
In Fig. 1 we have the table top closed and the towel rack extended and united over it. Three of the sections of the rack, at each end, are hinged together at the edge of the table, and held in position at the proper angles by tapes fastened to the side bars. A hook on each inside bar engages with a small staple on the table top to steady the rack, and the two upper leaves are hinged to this upright one and united over the center of the table by a metallic clasp. When not in use the racks are folded together and dropped at the ends of the table, being held by a swing catch, as seen in Fig. 2. In the front of the table are wire gauze doors which close shelves forming a double cupboard for the reception of food, etc., to be preserved from the ravages of flies and other insects. Above these doors are drawers, one intended for the reception of spices and condiments and the other is a kneading board.

The center and back board of the table top are hinged, the center one to the back one and that to the table frame. When the first is opened three compartments or tills are seen, for containing bread, flour, and similar articles. In front of these recep tacles is a molding board set with a slab of slate or marble, and pivoted to a sliding frame in the body of the table by which it can be lowered or raised. In Fig. 2 it is seen as ready for use.

There is still another contrivance in this *multum in parvo*. It is a rack for holding tin ware and other utensils, having at the bottom a series of boxes for knives, forks, spoons, etc. This rack is reached when the back board of the table is turned over. When the table is closed the rack and its row of boxes are lowered into the table body, by means of straps fastened at one end to the bottom of the rack and passing over rollers in the back edge of the table frame. The other ends of the straps are secured to a horizontal bar on the outside of the table, which is connected at its ends to two levers pivoted on the center of the ends of the table. In front, also, the levers are connected in a similar manner. In Fig. 1 the front bar is down and the rack is inclosed in the table. In Fig. 2 the front bar is raised and the rack elevated.

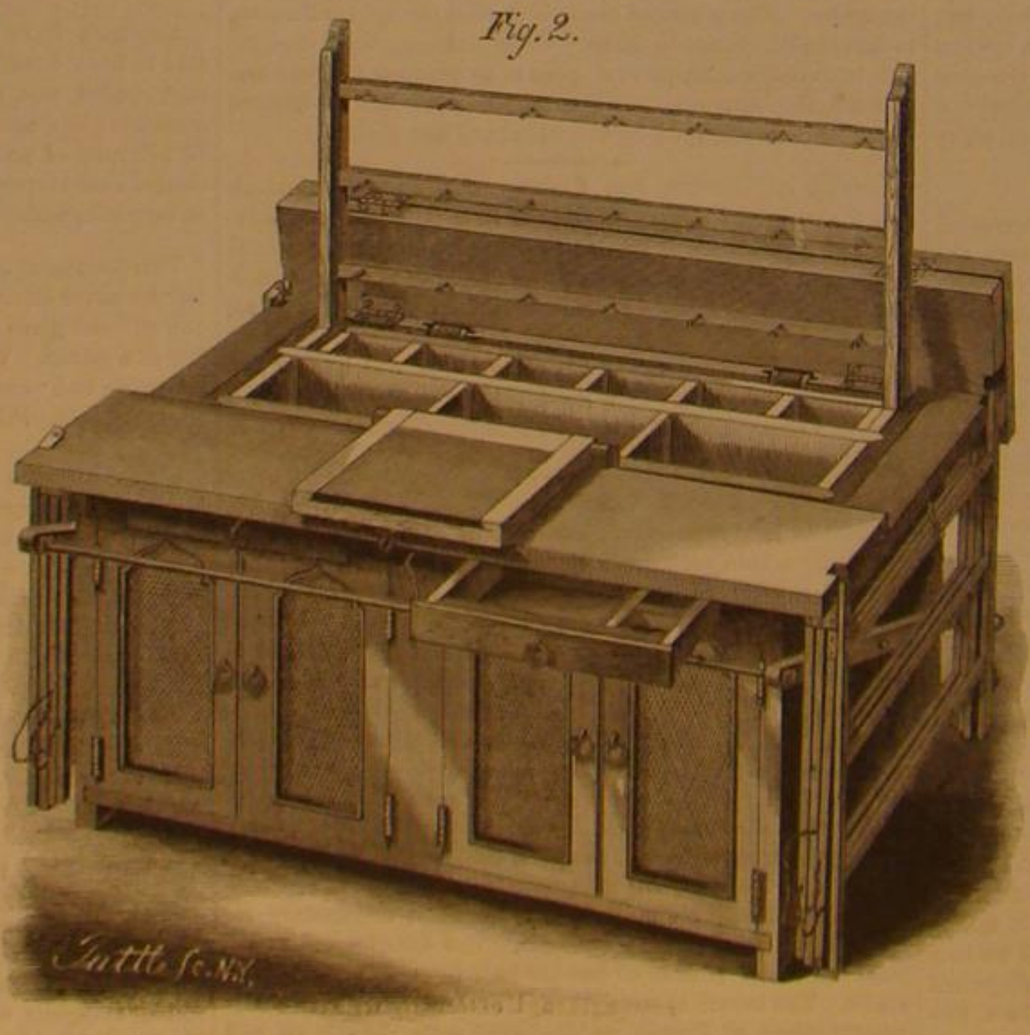
This device was patented through the Scientific American Patent Agency, Feb. 19, 1867, by W. M. Baker, whom address at Fortville, Hancock Co., Ind., for further particulars.

Fig. 1.



BAKER'S COMBINATION KITCHEN TABLE.

Fig. 2.



Re-inventions.

A paper was read at a late meeting of the Institution of Naval Architects, by Mr. McGregor, showing how inventions relating to marine propulsion have been many times re-invented and patented. The examination, undertaken for official purposes, extends over a period of two hundred and fifty years, embraces over one thousand patents of this class granted during this time, but had reference chiefly to some eight hundred granted ten years ago. First, as regards the power employed for propulsion: he found that aside from steam, ten distinct patents were granted for obtaining the power from animals, thirteen from wind exclusive of sails, six from springs, three from gunpowder, twelve from compressed air, thirteen from gas, and six from electricity. Of the Water Witch style of propulsion, by ejecting water from the vessel, fifty-nine patents had been taken out. Plans for propulsion by discharging in a similar way, gas, fire, or steam, were protected by twenty-nine patents. The paddle wheel itself, under nine patents is to be turned by wind, under nine patents by animals, thirteen by men, and one by combined action of steam and manual power combined. Feathering floats have been patented scores of times, every case being almost identically the same in principle and construction.

The screw propeller has a like series of duplicates of inventions where patents for an increasing pitch number five, adjustable pitch fourteen, sixteen were granted for screws to steer with, thirteen for screws in tubes, six for screws and paddles combined, and twelve for the form now called "twin screws." Before the year 1858 one hundred and forty patents were taken out for propellers with fore-and-aft motion, and precisely the same plan has been repeatedly patented within the last nine years. The patentees most alert in taking out these eight hundred marine-propulsion patents were engineers and private gentlemen, while of that class most directly interested in improvements of this nature there were only fourteen naval commanders, eleven ship builders, eight ship owners, and five mariners.

Petroleum as a Painting Oil.

In No. 20, current Vol., page 311, we published the substance of a communication from West Virginia on "Lubricating Petroleum as a Siccative Oil," referring to experiments made. Prof. Dussauce, who conducted the experiments, desires to correct what would be otherwise an error, the statement in regard to West Virginia lubricating petroleum. He says the experiments were not made with the lubricating petroleums indiscriminately of that section, but with one entirely dissimilar to the ordinary lubricating petroleum, which is of the same specific gravity as sperm oil and contains no paraffine, nor does it congeal at a very low temperature, properties which belong, so far as ascertained, only to that kind. The Professor does not claim the same siccative qualities for all lubricating petroleums, but only for this, the name of which and territory where obtained he does not, however, give.

A MAGNESIUM HAND LAMP for mines and tunnels has been made on Larkin's plan, to burn the metal in the form of powder instead of wire or ribbon, being fed by a simple mechanism with a spring. Sand may be intermingled to moderate the consumption and the intensity of the light, and it is supposed that lime may be substituted for sand with brilliant and yet economical effect. The light can be raised or lowered in a moment, so that no waste need be incurred.

Steamship Economy.

Mr. Murray's paper, read at the late meeting of the Institution of Naval Architects, will carry with it some discouragement to those who had counted upon the attainment of great economy by the use on board steamships of surface-condensers, compound engines, super-heaters. etc. As for surface condensation, it is as true that it has failed in many cases by causing the destruction of the boilers, as that it has been quite successful in many others. The causes of failure are very justly traced, however, in most cases, to neglect on the part of the engineers, and thus they are wholly preventable.

As for compound engines, they have, as a rule, worked with less fuel for their power than single engines, and they have an advantage, in the case of very high expansion, of bringing less irregularity of strain upon the piston rods, connecting rods, shaft, and brasses. Thus far, however, in the case of screw engines, they have often given more trouble in working than single engines, breaking down more frequently. Their greater complication, and the greater total weight of the working parts, were of course, obvious at first, but we consider that it was the duty of marine engineers to fairly work out a system offering certain undeniable and very considerable advantages. This they have done, so far as low-pressure compound engines are concerned; but the real applicability of this class of engines, is with pressures much higher than are regularly carried in any steam vessels, this side at least of the Mississppi river, where, in fresh water, from 150 lbs. to 180 lbs. is considered a fair range. The case, of course, goes more against quick-working compound engines, for screw ships, than against the compound paddle engines, working at a very moderate speed on the Pacific, so far away, too, that there is no one to tell us their mishaps and infirmities, supposing any to exist.

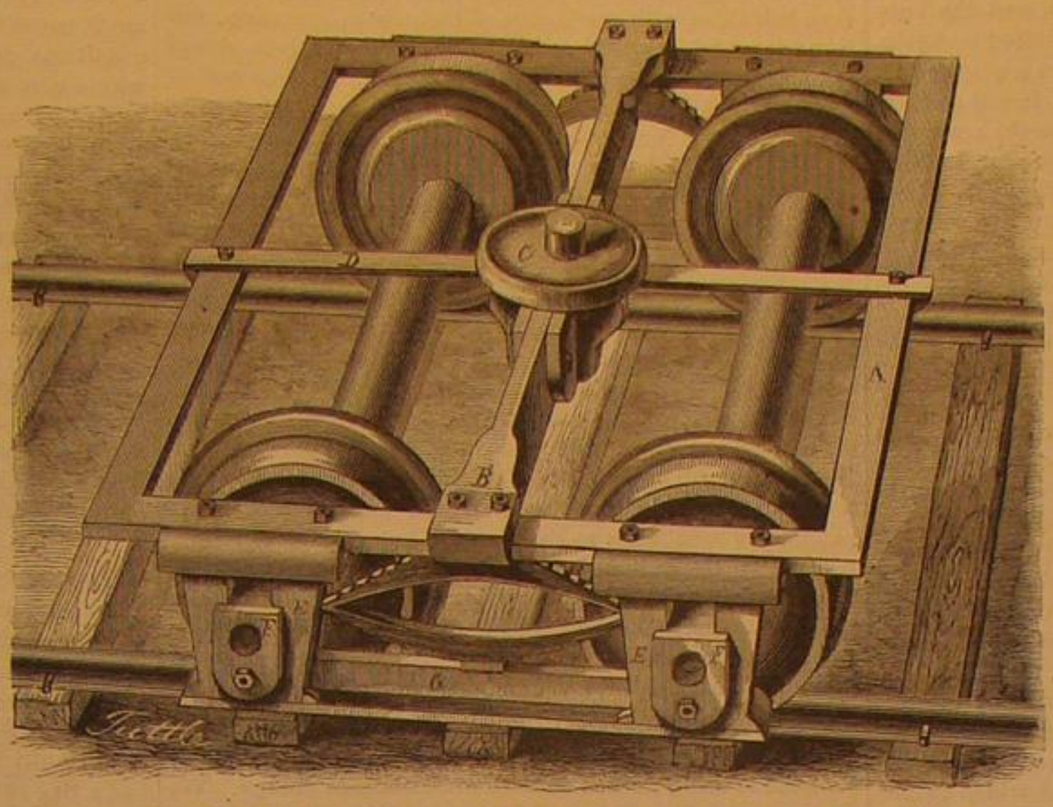
As for super-heating, really good boilers with high steam domes around the uptakes are well nigh independent of such aid, and all boilers may be, and ought to be make to give dry steam. It is dry, rather than very hot steam, that is required. Unsaturated steam, as Mr. Fairbairn and Mr. Tate showed very conclusively by their experiments made seven or eight years ago, has its elasticity considerably increased by the addition of a very few degrees of super-heat; and this clearly shows that the superheat converts a certain quantity of suspended moisture into additional steam. But when the whole is in the condition of a dry and perfectly elastic gas, as is then the case, it requires, as is well known of all the gases, a very considerable quantity of heat to produce any important increase of elasticity. The specific heat of steam is low as compared with that of water, for instance—or, in other words, it takes much less fuel, or much less by any measure representing the quantity of heat, as distinguished from its mere intensity by the thermometer, to heat a pound of steam say 100 deg. than would be required to heat a pound of water as a liquid to the same extent. And from this fact the elasticity of say one pound in weight of steam could be doubled by the application of much less heat than would be required to produce as much more steam from water. In these facts lie the theoretical advantage of superheating, and if rubbing surfaces of cast iron or any other known substance would stand it, we might go on superheating to almost any extent, and with decided economy in fuel. But the limit if practicability is very soon reached, and it lies not very far beyond the ordinary temperature of high-pressure steam itself. The heat which melts tin, not to say lead, turns oil into gum, and converts packing rings and valves into scraping instruments of great rasping efficiency. And the superheaters burn out and fall to pieces in rust, and nothing can save them. For moderate superheating, however, and a high steam dome around the uptake appears to answers the purpose, there is a decided gain, as otherwise a considerable portion of water, already heated to the full temperature of the steam, is thereby prevented from running away with so much heat at every stroke.—*Engineering.*

WORKING SHIPS' YARDS.—The improved method of bracing around ships' yards, introduced in England within a year or two, meets with high favor among those who have used it. The chain brace is continuous from one end of the yard to the other, passing across the deck through pulley blocks at the sides, and worked by a winch amidships. In bracing the yards one man can thus do the work of at least five, and the exposure and danger to the men is much lessened.

Improvement in Car Trucks.

The engraving is a perspective view of a very simple and strong truck for locomotives, freight, and passenger cars. The frame, A, is of iron, the sides braced by a bar, B, running across between the two axles. This bar is very deep and supports at its center the saddle, plate, and king bolt, C, having on its upper surface a recess to receive the plate. The saddle closes against the sides of the bar and is secured by screws or bolts. It is readily detached and another one substituted. D is a brace secured to the saddle and to the end bars of the frame, A. The struts, E, are bolted to the frame in the usual way. They carry the boxes, F, through the lower portion of which pass bolts or pins, which sustain the lower bar, G, on which rest the springs, either elliptical or semi-elliptical, in the latter case receptacles for their ends being formed on the bar, G.

The saddle support for the king bolt may be of steel or of cast or wrought iron. In the outer side of each box is an aperture through which the lubricating material can be introduced. These apertures are closed by slides, not seen in the engraving, to exclude dust. The arrangement of the springs with the bar, G, distributes the load evenly. The weight comes first on the spring through the medium of the bar, B, and is transmitted to the bar, G, and thence through the boxes to the axles. For passenger cars the double spring is used while the single spring is best adapted to locomotives and tenders. The whole truck is of iron, no wood being used. It is light, and from its material and method of construction, is strong. Railroad men will easily discover what advantages it possesses over the ordinary truck. It was patented January 22, 1867, by Reynolds & Cutler, whom address for additional particulars at Scranton, Pa.



REYNOLDS & CUTLER'S CAR TRUCK.

PETROLEUM AS A FUEL.

Fuel in the shape of coal is composed principally of carbon. Now in a case of perfect combustion, carbon combines with oxygen in the proportion of 6 lbs. of carbon to 16 lbs. of oxygen, and has a calorific value of 15. Allowing that coal is only 80 per cent. carbon, it will have a value of 12, and making a still greater allowance of 25 per cent. for imperfect combustion it will have a value of 9, which we will take as the calorific value of coal.

Fuel in the shape of petroleum is composed of carbon and hydrogen, (C_n+H_{n+2}) and the proportion by weight in the heavier oils is hydrogen one, to carbon six.

The calorific value of hydrogen is 64; therefore in a compound of carbon and hydrogen, which is one seventh hydrogen, the calorific value of the compound will be $\frac{15\times6+64}{7}=22$.

We have, therefore, for the calorific value of coal, 9, for the calorific value of petroleum oil, 22.

This allows for imperfect combustion of the coal, and perfect combustion of the oil. In practice, one pound of oil may be made to generate as much heat in combustion, as two pounds of coal.

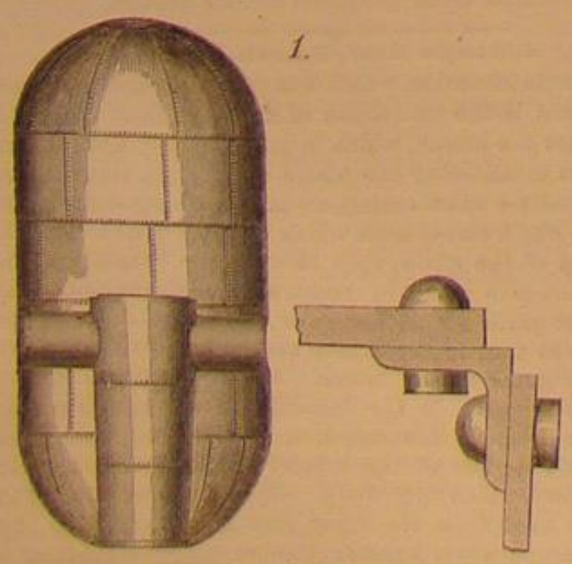
Probably no apparatus has as yet obtained these results, and no apparatus can possibly obtain more than this.

The above values are pounds of water evaporated (from 212°) per pound of combustible, and are taken from good authorities.

STEAM BOILERS---THEIR FORM, CONSTRUCTION, AND MATERIAL.

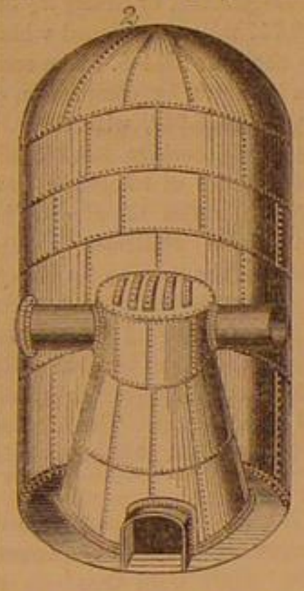
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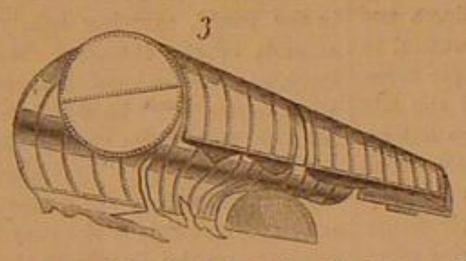
In the last article we noticed several instances of explosions caused by imperfect and weak construction, while the form of the boiler was not at fault. It may be truly affirmed that



such instances are altogether too common. A boiler is not merely a vessel of any prescribed form, made of boiler iron and riveted together. The stays, their strength, number, and arrangement are not less important, and where other devices are employed for strengthening the shell or other portions, the material should bear the proper relation in size, form, and fastening to the work it is expected to do and the force it has to resist. Want of judgment in these matters, and want of good workmanship will ruin the best planned boiler ever built.

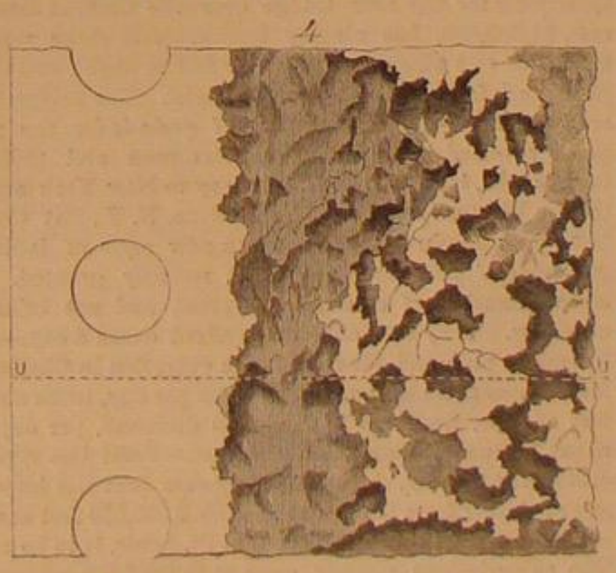
No. 1 is a case in point. This was an upright boiler with hemispherical ends, having a central flue rising from the bottom, connected near its top with a cross tube opening through the shell just below the center. This boiler utilized the waste heat from puddling furnaces, the heat passing over a portion of the shell, and then through the side tubes down through the center tube to the underground flue of the chimney. The ground plate forming the center tube was attached to the sides by a ring of angle iron shown in section in the engraving. From the proportions it can be seen that the angle iron is too weak. The pressure of steam on the flat crown plate fairly sheared the angle iron through, and the plate itself was blown down the tube into the chimney flue, when the boiler was violently lifted by the reaction of the water.





No. 2 exhibits a very weak boiler of a different construction. It has a flat bottom and an internal conical fire box with two side tubes opening through the shell. There were no stays between the fire box and the shell, and the fire box broke from its crown sheet and blew down upon the grate. The flat bottom gave way at the angle iron, while the shell flew to a great hight a shapeless mass.

Corrosion is a prolific cause of explosions. It may be local or general, internal or external. The latter sort of corrosion are too little noticed generally. Improper setting of boilers is one cause of it, and where the locality is concealed the deterioration may be carried on for a long period before attention is directed to it, and perhaps the first intimation may be a terrific explosion. Such an instance is shown in No. 3, where the corrosion followed the line of brick work upon which the boiler rested. The bricks being porous conducted moisture from a damp foundation and deposited it on the boiler at the point of contact, oxidizing the iron. Where the corrosion, either internal or external, is local and confined to a small surface, sometimes the strength of the surrounding plates will prevent an explosion, the boiler merely opening at the weak spot and discharging the water and steam, but this does not often occur. Corrosions generally extend over considerable extent; especially is this the case where the corrosion is internal, caused by impure water. Specimens of corrosion from this cause are given in Nos. 4, 5, 6, and 7. It attacks the iron in pits and spots, making deep holes in places where probably the iron is of a quality peculiarly susceptible to oxidation. Scale is undoubtedly a protection to the iron from this action as may be seen in No. 6, where the holes eaten by corrosion are larger below the surface than where protected by the scale.

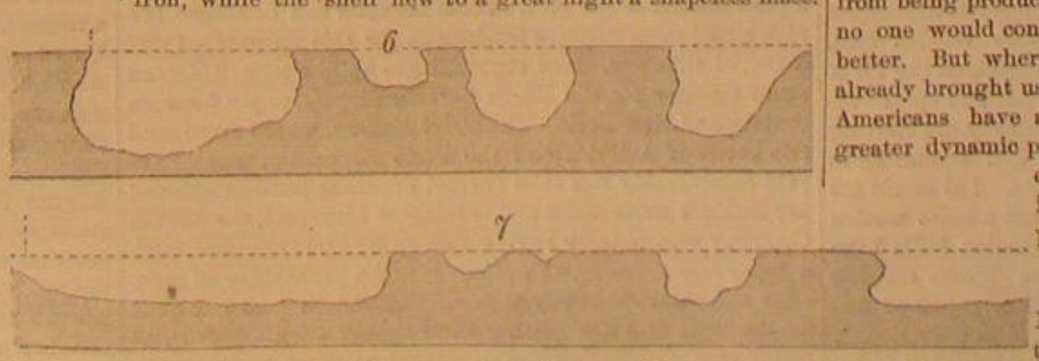




This engraving is a section of the plate shown in face view in No. 4. It is drawn to full size and taken through the line, U. This plate was cut from the lower part of the shell of a large tubular boiler externally fired. The corrosion was greatest on that portion most exposed to heat and had been going on for eight years. It was caused by water obtained from iron mines. It will be seen that its effects extended almost through the plate.

Nos. 5 and 7 represent a portion of a plate taken from a plain cylindrical boiler which had worked about ten years. The section, No. 7, is on the line, V, No. 5. While scale undoubtedly protects, in a measure, the surface from corrosion, at the same time it conceals the progress of the mischief.

Before this series of articles is finished we shall further allude to this subject of corrosion.



English and American Guns.

The dynamic value of a pound of powder burnt in one of the great American guns, it is well known, is greater than in the best English guns—a circumstance generally imputed to the large capacity of the bore relatively with the powder burnt, which permits the larger expansive employment of the gases. The initial pressure of the powder gas is less in the American gun than in the English, from the less load per square inch of areaof bore which theball imposes. Thebursting or damaging action is therefore less, while the dynamic value is greater—precisely the effects which we wish to produce, as our object is not to burst the gun, but to propel the shot.

It has already been explained in these pages how we may, by the aid of piston shot and other devices, best expend the energy of a projectile in producing penetration of armor or other intended effects. Heretofore the difficulty has been how to impart the requisite amount of energy to the shot, and two systems for doing this have been propounded—the English high-pressure system, with which it is almost impossible to avoid the bursting of the gun, even when of wrought iron, and the American low pressure system, in which the want of pressure is compensated by increased area of bore, and by which cast-iron guns may be used with comparative safety. Of course, there is nothing to prevent the American principle from being produced in wrought iron as well as in cast; and no one would contend that the wrought iron would not be better. But whereas we have adopted a system which has already brought us up to the limit of our best materials, the Americans have adopted a system which, while realizing greater dynamic power, has not yet brought them to the limit of their worst. It is almost an insult to our intelligence to ask us which system is to be preferred.—*Engineering.*

It is stated that Mr. Roebling, of Trenton, N. J., the bridge builder, and the parties interested in the Brooklyn bridge, which is to terminate at Sands street, Brooklyn, and near Tammany Hall, New York, have decided that no piers in the stream will be necessary, one being placed upon each bank of the river, and the 1800 feet distance between being accomplished by suspension.

GREENLAND.—Mr. Edward Whymper, the Matterhorn climber, and Mr. John Browne, the Rocky Mountain botanist, have started from Copenhagen on a tour through the interior of Greenland, in the interest of science, and at private expense.

Correspondence.

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

Hints to Inventors on the Destruction of the Potato Bug.

MESSRS. EDITORS:—Last year the potato tops were eaten up by great numbers of bugs, and the crop was very small. Some people would shake the stems a little, and the bugs would fall off, but next morning they had climbed up again. I know a man whose family picked more than a quart a day, but he did not raise as many potatoes as his family needed. In digging up the gardens this spring the grubs are found from 6 to 9 inches deep, just the same as last year, making their way to the surface in time to eat the coming crop. They are not found on any other plants, and very few are going to plant potatoes about this neighborhood this season.

I remember some years ago that the turnip tops were eaten the same way in England by a fly or bug, that diminished the crop so much as to affect the price of mutton, the large turnips being the main food for sheep, and farmers sowed very small patches. I remember well the laughter and derision that took place when it became known that a certain farmer, who had been boarding a poor Jack-of-all-trades that had been making what they ironically termed a perpetual motion, had sowed nearly all his farm to turnips, for they believed he would not get 50 good ones from it. The farmer and inventor told them that they had a machine that would save the crop: but nothing short of seeing the crop, which was an excellent one, of large, smooth, and almost spherical turnips, could convince them, and the result was, the farmer who found the means and the inventor who constructed the machine made each a fortune by supplying the machines for destroying the bugs or flies. It was very simple and resembled a sulky plow, having two wheels to drive a fan which sucked up the insects and dashed them against a board which killed them.

Now perhaps some experimentalist who has the means will take a hint from this, and enable farmers to destroy these loathsome and disgusting insects, so that since the old disease or rot has nearly disappeared, we may have plenty of potatoes.

W. J.

Galena, Ill., May 6, 1867.

Kerosene and Caterpillars.

MESSRS. EDITORS:—A few years ago I was living in a house in Kentucky, before which stood two beautiful shade trees of ailanthus kind. I had raised them from mere saplings, and they now stood as high as the roof, and were beautiful in form. My next-door neighbor has a number of apple trees, into which the caterpillar worm, sometimes called the silk worm, sometimes the drop worm, had got to a large extent, and had eaten up almost every leaf. The next year I watched for them on my shade trees, and sure enough they came in large numbers, and enveloped both trees with their gauzy network to a great extent. I had studied my plans, and when they had got full possession and well established in their colony I put my plans in execution as follows. I got a long, one and a-half inch auger, with which I bored a hole down into the heart of the tree, at an angle of about 45°. I filled this hole with coal oil, such as I was then burning in my lamp, and corked the hole up. I watched for the result. The next day I perceived no effect. The second day I noticed a number of the insects crawling about the fences and bushes, and in other unusual places; so thinking I had done some little that evening I took out the cork and again filled the hole—which was empty—corking up as before. The third day they were to be seen running everywhere except on the shade tree, which they most decidely avoided, except the younger ones in the web which I had to take out forcibly, neverthless I filled the hole again once more, My experiment stopped the progress of their destruction for that season on that tree.

R. Y.

Cincinnati, Ohio.

[The writer is silent concerning the effect on the tree. We suspect that there are trees as well as bugs to which coal oil is hateful. Perhaps his ailanthus would have run away as fast as the caterpillars had Providence furnished it with legs. We have heard of sulphur being used in a similar manner with like success and we should presume with less injury to the tree.—EDS.

BUSINESS AND MANUFACTURING ITEMS.

WOOLEN.—The Lewiston Falls (Me.) Manufacturing Company have "shut down" on account of the general depression in the woolen-goods market.—The Woodvale Woolen Mill, at Johnstown, Pa., which partially stopped work on the 1st of April, is now running with full force, but pays its operatives reduced wages.—The Pittsfield Woolen Company are starting up their machinery after a long silence, and beginning to manufacture heavy beaver goods for fall trade. 100 hands are employed.—Boffins & Co. have recently built a large woolen mill at Rushville, Ind.—The Oregon City Woolen Mills have lately received from the Worcester Loom Works six new looms, two spinning jacks and several other pieces of machinery. This manufactory will now have in operation 25 looms, most of them of the latest patterns, 8 spinning jacks, 6 sets of carders, and other machinery to match, with a capacity for working 600,000 pounds of wool, running day and night.

COTTON.—A new cotton mill is nearly ready to be started in Wauregan (Plainfield) Conn. It is a duplicate of the large mill built some 18 years ago by the Wauregan Company, and is connected with it by a middle structure 157 feet long by 40 wide, for repair shops and the water wheels. Their main mills are 500 feet long by 50 wide, with 5 stories, and will run 50,000 spindles and 1,124 looms on print cloths and sheetings. Machinery for this new mill was ordered in England, and some of it has arrived. The pickers, however, are all built in this country, and are not excelled by any either of American or English manufacture.—The Arnolds, who now carry on four cotton mills and employ 350 hands at North Adams, turning out 5,000 pieces of print per week, are building at Williamstown a new mill which will contain 300 looms.—The new mill of the Willimantic Linen Company is now more than half filled with machinery, of the newest invention, and is in successful operation. This is one of the largest thread establishments in the United States, making all sizes and 32 different shades of color.—An improvement recently patented in machine-knit hosiery consists in knitting a tube with protuberances and contractions at proper intervals, which form the heels and toes; so that a machine turns out, instead of the ordinary straight cylindrical web, a continuous string of stockings.

IRON.—The Troy Bessemer Steel Works are capable of converting 60 tuns per day.—The Albany Iron Manufacturing Company, incorporated at the late session of the Legislature, has bought 50 acres of land in Albany, and will build thereon a blast furnace, rolling mill, etc. Other parties will erect a stove foundry, which will give employment to 125 hands, on the island south of the city.—The stock of a new company for the manufacture of knitting machines under an exclusive patent, has been taken at Bath, Me.—Three small iron steamboats have lately been built in San Francisco for the navigation of Lake Chapala, in the interior of Mexico, near the city of Guadalajara. The first boat has been shipped in pieces to San Blas. From that port the materials will be hauled over mountainous roads several hundreds of miles to the shores of the lake, where the boat will be put together and launched.

RAILROADS.—The Pittston *Gazette* says: The Lehigh Valley Railroad is being pushed on with commendable energy. We can see nothing to prevent this route to Wilkesbarre and the cities being opened at the time first announced, August next.—The Union Coal Company's road is rapidly approaching completion. During the month of May the third rail will be laid, and trains put on.—The British Railways in existence at the end of 1865 cost a total of £455,478,143, or nearly 2¼ billions of dollars.—India contained 2,747 miles of railroad which conveyed 12,826,518 passengers in the year 1864–5. The commercial progress of British India is shown by comparison of the imports of 1840–1, amounting to £8,415,940, with those of 1864–5, which amounted to £28,150,923, besides £21,363,352 of treasure.—There are about 86,000 miles of telegraph now in the world, carrying nearly 250,000 miles of wire.—The summit of the intended Mount Cenis Railroad is 5815 feet above the sea level. The terminus of the railway up Mount Washington will be 6,226 feet. A contemplated mountain railway from Vera Cruz to Mexico must ascend 8,460 feet, and this hight must be climbed from the ocean level in a distance of 150 miles; the gradient for great distances is as much as 1 in 25, and this with many and short curves. The highest elevation on the Pacific Railroad is 9,504 feet at the one hundredth meridian.

MISCELLANEOUS.—The estimated value of the manufactures of San Francisco for 1866 was over $20,000,000, and the aggregate in the State about $30,000,000. More than usual attention has been given recently to the manufacture of plows, farm wagons, and the smaller implements of husbandry.—Quarrying for the new bridge over the Ohio, at Louisville, cost, $1,500,000, has already begun. The stone work is to consist of two abutments, each 80 feet in hight, and thirteen piers each from 120 to 140 feet in hight. The bridge is to be ready by 1870.—The movement of grain is for the present quite reversed in its direction. European and Californian bread stuffs, it is said, find their way to New York and even to the Western States.—The Modena, N. Y., Hat Company have just begun to manufacture a new style of ladies' and gentlemens' hats under a patent recently granted. It is a close imitation of straw, water-proof, and not injured by crushing. They turn out one hundred dozen a day.—A new hydraulic pipe and file machine in operation in Charlestown, Mass., runs at an expense of 60 cents per day, turns out 1,000 feet of pipe, from 3 to 12 inches in diameter, per day, with about 13 tuns pressure on every pipe.—From the reports of customs at Sydney, Australia, it appears that the imports of sawed timber from Oregon are nearly 3,000,000 feet annually.—The mammoth Lindell hotel, at St. Louis, is to be rebuilt. The subscriptions already amount to $285,000.—The street department of the city of Montreal has tried with satisfaction the plan of loosening up packed snow and ice by means of a plow instead of the pick. Some inventor can doubtless furnish a still more effective implement for this purpose.—Caird & Co., of Glasgow, have contracted to build a new 2,600-tun screw steamer for the North German Lloyd's, to ply between Bremen and New York.—The *Great Eastern*, whose first round trip between America and the Paris Exposition must have paid considerably less than current expenses, has discontinued her luckless movements and is lying at Liverpool, the French Company undoubtedly having thrown up their contract, with a heavy loss already on their hands and a probability of damages and costs yet to pay at law. Passengers who had paid for the next trip are getting their money back.—The great steam ram *Dunderberg* was purchased at short notice by the French Government through the Atlantic telegraph, while the peril of war was still imminent. The cost of the ship, about $1,750,000, is said to have been paid.

POMPEII.—One of the latest discoveries reported from the excavations, is that of a bronze vase hermetically sealed, and containing a considerable quantity of water, which was pronounced clear, fresh, and remarkably soft, after its repose of 1800 years.

MINING INTELLIGENCE.

THE NEW COLORADO COAL FIELDS.—At Belmont, Boulder county, eleven distinct veins of coal have been discovered. The principal vein yet worked is nearly horizontal, commenced with a thickness of two feet, has deepened to twelve, and is deepening still. The other veins vary from three to twenty-one feet in thickness. All are packed in fire clay above and beneath. At Profile Butte, three miles south of Belmont, seven veins have been found under precisely similar conditions, partially laid bare in the bank of a creek. Elsewhere also, the coal appears all along the mountains. Specimens from a vein 11 feet thick, containing considerable rosin, have been received at the General Land Office, Washington. Mr. Herman Stoelting, the mining engineer who reports these facts, describes the coal as of a fine black color, burning with a long yellow flame, emitting but little smoke, and leaving but little ashes, of a white or reddish color. It appears to be uncommonly free from slate and iron pyrites. Judging from the surrounding deposits, the coal is not a true bituminous but a brown coal or lignite. Iron ore is extensively scattered over the surface, in quantities sufficient to supply several blast furnaces for a series of years. Pieces as large as 1000 pounds in weight have been found imbedded in the soil. It yields from fifty to seventy per cent of metallic iron. The ore also contains manganese, which renders it favorable for smelting.

THE CANADA GOLD MINES.—An official report from the Inspector of the Quinte gold-mining district shows that up to the 6th of May about one hundred shafts had been sunk in Madoc and surrounding townships, and within the last month some two or three thousand miners, prospecters, etc., have added themselves to the population. A steam quartz-crushing machine had been imported and would go into operation in a few days. Daily mails are extended through the mining region, and a line of telegraph is being rapidly pushed forward to a central point. The Montreal *Herald* notices a Chaudiere nugget weighing fifty-one ounces, and worth nearly $1,000 found upon what is called the Kilgour claim, at about eighteen feet below the surface of the ground, and some thirty feet distant from the Gilbert river. Mr. Lombard, of Chicago, is now the owner of the Richardson mine. Quartz machinery will be placed on the spot and a large amount of capital invested.

The gold discoveries in the Vermillion Lake region, Minnesota, are being extensively worked.

The Levant mine, Cornwall, commenced in 1820, has turned out $5,000,000 worth of copper and tin ores. The engine shaft is now 1700 feet below the surface, and two of the levels extend about three quarters of a mile beneath the Atlantic Ocean.

Several veins of the valuable "black band" ore (a mixture of nearly pure iron and coal which we have heretofore described) are being worked and new veins are being opened. The total amount shipped over the Mill Creek railroad, to April 20th, was 2,866 tuns. A bed supposed to be black band, or carbonaceous iron ore, has been found at Phœnix Park, lying immediately on the Diamond or J. It is about ten inches thick, and can be worked with economy in connection with the coal, by the Welsh plan of mining.

Peat of an excellent quality is found in Wisconsin, and can be supplied to consumers at one fifth the cost of any other fuel.

It is stated that in the exportation of coal Erie ranks second in the United States. The amount of the export trade of 1866 was over 250,000 tuns. The bituminous coal is taken by vessels to the ports on the upper lake—mostly to Chicago. The returning freights are made up from the ores of Lake Superior.

OIL.—During the four days ending April 12th, the receipts of petroleum at the port of Pittsburgh reached the unprecedented amount of 97,284 barrels, the greatest amount ever received in the same duration of time since the establishment of the oil business. The Titusville *Herald* says: The amount of iron tankage is now over one half million of dollars. Large owners have determined to store all their oil until a fair price can be had, and with a half million barrels safely stored now, and another half million of tankage, to place the oil market absolutely under the control of oil producers and speculators.

Galand's New Breech-Loader.

This simple invention, which has gained immediate attention in Paris, is the production of a gunsmith at Liege. A screw closes the breech, which is partly hollow, and contains four pieces constituting the whole mechanism, viz: the percussion needle, a spiral spring, a pin performing the office of a trigger, and a sort of hook which operates to cock the gun. Two turns of the screw open or close the breech, and the whole is taken to pieces by unscrewing a single nut. The gun can be made for 25 francs, or less than $5. A device analogous to that in the James cannon is used to prevent the loss of gases at the breech. A sort of conical copper thimble is attached to the extremity of the breech screw, made of extremely thin metal, so as to spread out by the pressure of the gases at the instant of discharge, and cover the joints into which they would otherwise penetrate. The powder is fired from the upper part of the cartridge, by pressing the pin above named. The cartridge consists of a small canvas bag with a disk of pasteboard at the bottom, and at the center of the disk a little fulminate; upon this five grammes (say 1-5 oz.) of powder is placed; next, a greased wad; finally the bullet, over which the bag is tightly tied. Nothing remains of the cartridge in the barrel after firing

COAL IN AFRICA.—Dr. Livingstone's last expedition inland, from Pemba or Kinday harbour, disclosed frequent trunks of silicified wood, a sure indication of coal berneath, and pieces of it were met with in the sands of the river.

Recent American and Foreign Patents.

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

EXPRESS MONEY ENVELOPE.—E. Hulbert, Atlanta, Ga.—This invention consists in an improved express money envelope so constructed that the enclosed package may be protected on all sides by a double covering, and which, it will be impossible to open without leaving traces to show that it has been tampered with.

WIND POWER.—C. C. Gish, Virden, Ill.—This invention relates to a new and improved wind power designed for pumping water, and it consists of a wind wheel constructed in a novel manner and arranged in connection with a pump, tank, and a receiver provided with a valve with float attached, and connected with a lever by which the wings of the wind wheel may be opened and closed automatically.

PRESSING BRICK.—Horace Crofoot, Oak Park, Ill.—This invention relates to a new and useful improvement in pressing bricks from dry clay. The object of the invention is to compress the dry clay in such a manner that atmospheric air will be expelled therefrom, whereby the pressed clay or unburnt bricks are prevented from cracking while being burnt, a contingency which at present causes many imperfect bricks owing to the cracking of the same by the expansion of the air in them under the heat of the kiln.

BEDSTEAD.—G. G. Cochrane, Brooklyn, N. Y.—This invention relates to a new and improved means employed for securing the parts of the bedstead together, whereby a firm and secure connection of the parts is obtained, and which will admit of the bedstead being put up and taken down with the greatest facility.

FLOUR BOLT.—Benjamin Boormar, Waukesha, Wis.—This invention consists in constructing the reel in such a manner that it will have a smooth interior without any obstructions or projections to interfere with a proper passage of the drop through the bolt. This result is effected by securing the bolting cloth to the inner surfaces of the longitudinal slats of the reel frame.

MOP HEADS.—H. H. Mason and Joseph Messenger, Springfield, Vt.—This invention relates to a new and useful improvement in that class of mop heads which have their movable jaws operated by a screw and nut. The invention consists in a novel way of attaching or connecting the ends of the wire or rod, comparing said jaw to the nut, whereby a very cheap and durable connection of said parts is obtained.

ATTACHMENT FOR FAN MILLS AND OTHER MACHINES.—Herman Wolf, Avon, Pa.—This invention has for its object to furnish an improved device for attachment to fan mills and other machines to hold them steady and in their places while being used, and by means of which they may be adjusted and held steadily even upon an uneven floor.

BRICK MACHINE.—Thomas Walsh, John Walsh, David Evans, Brownsville, Tenn.—This invention relates to a new and improved machine for pressing and molding bricks, whereby a very compact, strong and durable machine for the purpose specified is obtained, and one which will perform the work expeditely with but a moderate application of power.

CULTIVATOR.—G. W. Stockton, Oquauka, Ill.—This invention relates to a new and improved cultivator for cultivating crops grown in hills or drills, and consists in a novel manner of hanging and arranging the plow beams, whereby the plows are placed under the complete control of the operator and rendered capable of being moved laterally or vertically as occasion may require.

COTTON PICKER.—J. E. Carver, Bridgewater, Mass.—This invention relates to a new and improved cotton picker designed to supersede the direct manual process or the detaching of the cotton from the bolls directly by hand. The invention consists in the employment or use of a reciprocating tongue provided with teeth and fitted within an oblong quadrilateral box. This tongue is armed with reflex spires or teeth and directly above it within the box, there is an elastic plate also armed with reflex spires or teeth which serve to hold the cotton abstracted from the bolls and drawn into the box by the inward movement of the tongue and insure its discharge from the rear end of the box.

RAILROAD SWEEPER.—Edward A. F. Olmstead, New York City.—This invention has for its object to improve the construction of the railroad sweeper patented July 10, 1866, and numbered 56,236, so as to make its operation more satisfactory and effective.

POTATO DIGGER.—Thomas Burditt and George B. Burditt, Dansville, N. Y.—This invention has for its object to furnish a simple and convenient hand machine for digging potatoes by the use of which the operation may be greatly facilitated.

APPARATUS FOR PACKING COTTON AND SIMILAR SUBSTANCES.—F. A. L. Cassidey, Newmansville, Pa.—This invention has for its object to furnish an improved apparatus for packing cotton and other similar substances and introducing them into bags or sacking.

APPARATUS FOR IMPREGNATING WOOD.—George Pastkuchen, Hoboken, N. J.—This invention relates to a machine in which railroad ties and sleepers and any other kind of wood can be dried and saturated with tar or any other suitable substance which will prevent the decaying of the wood. The invention consists in the arrangement and construction of a boiler and of a sheet-metal cylinder into which the wood is placed. The annular boiler surrounds the cylinder and is placed upon a furnace; the steam created in the boiler is used to drive an air pump whereby a vacuum is created in the drying cylinder, and the pores of the wood are opened to receive the substance with which they are to be filled.

NIPPERS.—Thomas G. Hall, New York City.—This invention relates to a pair of nippers the movable jaw of which is secured to one end of a lever, the other end of which is acted upon by a toe attached to the inner end of the appropriate handle in such a manner that a great leverage is effected and the operation of the nippers in cutting wire or other articles is materially facilitated. The stationary jaw is secured to the end of its handle by dovetail end screws so that the same can be readily taken off for the purpose of sharpening or that it can be replaced when worn out. A suitable set screw prevents the cutting edges of the two jaws from overlapping or from being forced too close.

DEVICE FOR SHARPENING CUTLERY.—James Meyer, Jr., New York City.—This invention relates to a new and improved device for sharpening cutlery of all kinds, and has for its object portability, efficiency and economy in construction. The invention is an improvement on that class of sharpeners in which the hard steel cutting plates are connected by a pivot and between which the blade to be sharpened is drawn. An engraving of this invention will shortly appear in our columns.

SMELTING FURNACE.—James A. Root, East Canaan, Conn., and J. N. Bartram, Sharon, Conn.—This invention consists in constructing the hearth of stone cut and laid in such a manner as to have a circular interior in its horizontal section and admit of the furnace operating perfectly when first erected. The usual way is to build the hearths of fire brick, and of square form, which invariably operates imperfectly until c[illegible]ition caused by the descending ore wear them in cylindrical form. e angular corners form a great obstruction to the descending ore and occasion considerable trouble until they become rounded by wear. The invention further consists in a novel and improved manner of constructing the blast tubes, to wit: with telescopic slides or extension pipes, as hereinafter fully shown and described, whereby said pipes may, with the greatest facility be graduated in length as circumstances require.

MACHINE FOR GRINDING AND GAGING SCALE PIVOTS.—Frederick Meyer, Newark, N. J.—The object of this invention is to grind or polish the pivots on scale beams and levers in such a manner that thereby the same are correctly gaged so that the distances between the different pivots are exactly and automatically determined.

DEVICE FOR REGULATING THE FLOW OF LIQUID.—J. H. Guild, Rupert, Vt.—This invention relates to a device whereby the flow of liquids into vessels of any description may be regulated so that the liquid may not rise above a certain mark. Its object is to so arrange the apparatus that the valves which generally get out of order after having been used for some time, may be done awa with

SLEIGH BRAKE.—Frederick Cohlmeear, Keck's Center, N. Y.—This invention has for its object to furnish an improved sleigh brake, so constructed and arranged that whenever it is necessary for the horses to hold back the sleigh, the act of holding back will apply the brake with a force proportioned to the forward pressure of the sleigh.

CHURN.—William Alexander, Union Valley, N. Y.—This invention has for its object to furnish an improved churn, simple in construction, not liable to get out of order, and which will churn the cream quicker and more evenly than the churns now in use.

SCRAPER.—Philander S. Foster, Richmond, Me.—This invention has for its object to furnish an improved scraper, by which the snow may be removed easily and quickly from ice, streets, walks, yards, etc.

CULTIVATOR.—A. T. Heflin, Monmouth, Ill.—This invention has for its object to furnish an improved cultivator, by means of which two rows may be cultivated at the same time.

STUMP EXTRACTOR.—David Carroll, Union, Pa.—This invention relates to that class of machines employed for extracting stumps in fields, and consists in the employment of an endless chain, in combination with three wheels, over and around which the chain works, the said wheels being located upon a derrick erected for the purpose.

BEEHIVE.—Lafayette Kramer, Point Pleasant, Pa.—This invention relates to improvements in the construction of beehives, and consists in the arrangement of movable boxes fitted in a case for double or single hives, and so connected that a swarm of bees can be driven from one box into another box, which is empty, whenever the cells in the old honey comb become clogged with wax, causing the bees to degenerate in size and activity, and it is necessary to restore the swarm by building a new comb; also in a convenient provision for colonizing or forming new swarms; also in plans for thorough ventilation of the hive, and for a moth trap which effectually excludes the bee moth from the hive, and provides for the destruction of the worms.

COTTON-BALE TIE.—William Onions, St. Louis, Mo.—This invention relates to an improved device for fastening the iron hoops on cotton and other bales.

PLOW.—Darwin Almy, Tiverton, Mass.—This invention consists in a guide or regulating wheel, and its connections for attaching to any common plow, and detached when desirable.

LOCK.—George B. F. Cooper, New Albany, Ind.—This invention relates to an improvement in locks more especially designed for railroad freight cars, but applicable to warehouses and other purposes, and capable of modification for use on either sliding or swinging doors.

SELF-ADJUSTING CAR TRUCK.—J. Q. A. De Huff, Summitville, Iowa.—This invention relates to an improvement in railroad car trucks, and consists in arranging each of the wheels to run on an independent axle, instead of connecting them to run in pairs on the same axle, as usual; but while the wheels shall move independently of each other on their own axles, they are so connected and arranged in movable boxes that they shall act in concert, and in turning curves of a track the axles will all preserve a position at right angles to the line of motion.

STEAM AND LIQUID PRESSURE REGULATOR.—William H. Stanton, Dunmore, Pa.—This invention consists in arranging a cylinder and piston and other appliances, and controlling the piston in such a manner that being connected with the safety valve lever, and operated by steam from the boiler, the safety valve will be opened or closed by the pressure of the steam on the piston.

DOOR HOLDER.—William Quagle, Warsaw, Ill.—This invention relates to the manner in which a swinging door is made to stand in any desired position when open.

STEAM GENERATOR.—Thomas C. Little, Dixon, Ill.—This invention consists in injecting water by a force pump against heated and steam generating surfaces.

KETTLE.—Allen N. Merrill, Batavia, Ill.—This invention consists in pivoting the cover to the rim or flange of the kettle at one side or eccentrically, and providing a lip at the opposite side of the top of the kettle, by which the lid is fastened or prevented from raising without raising the kettle; and also in the manner in which the cover is locked in that position.

OIL CUP.—William Douglas and H. M. Ingler, Bellair, Ohio.—This invention consists in so constructing an oil cup that the oil that reaches the wrist or journal shall be discharged upward, by the motion of the cup on the crank, through a hole so small that the quantity discharged shall only be sufficient to lubricate the wrist for which it is intended.

APPARATUS FOR THE PRODUCTION OF ILLUMINATING GAS FROM PETROLEUM.—Heinrich Hizel, Leipsic, Saxony.—This invention relates to improvements in apparatus for the production of illuminating gas from petroleum and petroleum residue, and consists of a mechanism for pumping petroleum or petroleum residue into a retort heated to a red heat in a continuous jet. Being there immediately converted into gas, it is conducted to a condenser, and thence led to the gasometer.

MANUFACTURE OF VINEGAR.—John Higbie, Ulster Park, N. Y.—This invention relates to an improved process for the manufacture of vinegar from apples, including the skins and cores, the refuse going to make, when mixed with steamed potatoes, ground feed, and refuse milk when convenient, an excellent feed for pigs.

LINIMENT.—James. C. Dustan, New Vernon, N. J.—This invention or discovery relates to an improved composition liniment, or medical compound, for the cure of sprains in the joints of horses and other animals, spavins, ring-bones, splints, poll evil, fistulous withers, stringhalt, and other diseases to which horses are especially subject,

BENCH VISE.—Charles R. Gibson, Madison, Ind.—This invention relates to a method by which the vise is made to adjust itself to the shape of the article put into it whether such article be square or tapering.

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 50 cents a line, under the head of "Business and Personal."

H. S., of Ohio.—Take nitric acid, dilute it with water—equal proportions of each—moisten the gun barrel with it, and let it lie a day or two. Wash it in water, and rub with oil and polish with beeswax. The barrel must be free from grease when the acid is applied. This will handsomely brown your barrel.

I. W. A., of Ohio.—You will find our ideas of perpetual motion briefly expressed in No. 21 current volume page 330 and 331. . . . Miller's saw teeth are inserted by springing the plate of the saw half the thickness of the tooth. Address the patentee for more definite information.

V. C., of Mich.—The error of substituting "feet" for "inches" in our paragraph relative to the steamer *Russia*, is so evidently a typographical one that your inquiry is superfluous. "Even Homer sometimes nods" etc.

G. H. M., of N. Y.—Green wood in seasoning shrinks or contracts. Of course if a seasoned spoke is driven into a mortise made in a green hub, when the hub is seasoned the spoke will be loose.

W. W. T., of Mass.—Rifle balls are usually lubricated with a mixture of tallow and wax. Paraffine is now largely used and is the best and cheapest. If too hard, melt a little tallow with it.

J. P. J., of Conn.—You can make a brilliant green for maps, charts, and engravings to be tinted with water colors by pouring the whites of eggs on common coffee berries. It is glossy and durable.

S. M. P., of Mass.—A cut nail if crooked will break when straightened on stone sooner than when straightened on iron. It may be from the want of elasticity in the stone, but probably is on account of the irregularities of surface or the softness of material of the stone, allowing the ends of the nail to imbed itself and offer resistance to its movement

J. L., of Pa.—Mica has been used for a long time for the windows in stoves and furnace doors. Lately it is used for reflectors, and for ornaments, one side of it being silvered with pure silver. The value of mica depends upon its transparency and the size of the sheets. Pieces only a few inches square are saleable provided they are clear and free from blemishes.

J. R. B., of N. Y., proposes to increase the efficiency of powder in blasting by securing a body of air between the charge of powder and the tamping. A few inches above the powder, the fuse having been properly adjusted, he secures a wad of cloth or tow and then fills up the hole with sand or other tamping material. He has tried the experiment with very satisfactory results. He illustrates the philosophy of the case, by alluding to the well known fact that guns are liable to burst when the charge is not well rammed down to the powder.

F. E. B., of Iowa.—"What is the greatest weight lifted by water wheel 4 inches in diameter, under 2 feet head and 2 square inches of water?" The water strikes the wheel at a velocity of 681 feet per minute. This velocity of a stream 2 inches in cross section gives a total force of 2668 foot lbs. exerted on the wheel. An undershot wheel returns about one-third of this force, and the best turbines about four-fifths; consequently from 100 to 240 pounds per minute, might be lifted according to the construction of the wheel.

S. F. G., of Conn.—We have a favorable opinion of seasoning wood by the use of steam. By that process you may prevent the cracking of the wood which you use for screws, mallets, etc.

C. N., of N. Y.—We are not aware that any one has on sale an ink which is so fugitive that it becomes invisible shortly after writing with it.

G. L., of R. I.—To construct a small water filter, provide a false bottom to your cask, perforated with holes all over its surface; spread over this bottom one or more thicknesses of flannel, upon this a layer of fine clean sand, upon the sand pulverized charcoal, and at last fill up with gravel. A good proportion of sand charcoal and gravel would be, sand 1, charcoal, 4, gravel 2.

N. F., of Vt.—Dextrine is an excellent adhesive and is sometimes used on envelopes.

J. M. C., of Ill.—Water may be raised by a hydraulic ram to operate an overshot wheel, and when well constructed will utilize about 60 per cent of the force of water *i. e.* 100 lbs. of water will lift 60 lbs. to the hight from which the 100 fell, and 30 lbs. to double the hight. A turbine is more economical than the ram when a large quantity of water is to be raised.

L. D. G., of Me.—Waste no time nor money on divining rods, or fortune tellers.

A. M., of N. Y.—The best cheap solvent of india-rubber is petroleum naphtha. Some of the other solvents are bisulphide of carbon, benzole, sulphuric ether, chloroform, and camphene.

H. V., of Conn.—The neutral chromate of potash is yellow, and the bichromate is red. The first is the article you need for the ink. If you ask for yellow chromate of potash the druggists will understand you.

H. M. T.—"How many revolutions on its own axis will a wheel make in rolling once around a fixed wheel of the same size?" One.

L. and C., of Ind.—You can purify your gold alloy by keeping it melted in contact with air, or by melting it with borax and adding saltpeter.

C. E. D., of Mich.—You will probably not make a good job of patching your looking glass. Make the experiment thus: take a piece of tin foil a little larger than the bare spot on the glass, amalgamate its surface, cover the spot with it and retain it in place by means of a pad of cloth. The pad may be removed in a week.

R. W. R., of Pa.—The working load for a hempen rope 2 3-4 inches in circumference is from 600 to 900 lbs. breaking strain two to three tuns. You need such a rope for your system of pulleys (3 fixed and 3 movable) when you wish to raise a weight of 7000 lbs. The strain on each of the ropes of the system would be 700 lbs.

T. P., of N. Y.—We suggest that you try paraffine as a protector of the iron work, in your bleach house, which is exposed to the fumes of sulphur. The paraffine may be applied in the melted state or in solution of petroleum oil.

H. H. H., of Miss.—You will find on reference to the former issues of this paper abundance of reliable formulas for the preparation of writing ink.

C. O. V., of Pa.—To discharge the magnetism from a small piece of steel like the balance of a watch determine in what parts its poles are located, and bring in contact with one of them, the similar pole of an ordinary magnet.

B. R., of N. Y., believes the cause of abortion in cows is an unnatural position of the foetus, by which the unbillical cord becomes pressed against its throat and stops the circulation of the blood. The peculiar position of the foetus is often brought about, when the cow jumps over fences or wide ditches.

E. C., of Vt.—Dry gas meters are now extensively in use, and they are constructed on the bellows principle which you describe.

R. C., of C. W.—Straw goods are bleached by exposing them to the fumes of burning sulphur. A good way to carry on the process on a small scale, is to place a few ounces of sulphur on an earthen plate at the bottom of a barrel, set the sulphur on fire, and hang the articles to be bleached, above reach of the flame. The barrel may now be covered till the bleaching is perfected. You will have no difficulty in bleaching straw like the sample you send. . . . You can prepare hypochlorite of magnesia, by adding a solution of Epsom salt to a solution of bleaching powder, until the precipitate of sulphate of lime ceases to be produced.

W. B., of Mass.—You may make a silicate of soda which will answer your purpose as follows: Take pulverized quartz 1 part, bicarbonate of soda 4 parts, mix intimately and melt in a crucible. When the glass is cold, pulverize and dissolve by boiling in water.

A. H. B., of Vt.—Add about five per cent of tin to the zinc which you cast in thin plates. The alloy melts at a lower temperature and is more fluid than zinc. In casting see that the sand is not too damp, and have wide gate ways.

G. B., of Mass, says: "In your 'Answers to Correspondents,' No. 18, current volume, you reply to 'A. D. B.,' of Mass., that his engine of 13½ inches, 30 inches stroke, 72 revolutions, and 80 pounds pressure, steam cut off at half stroke has a horse-power of 99 678. I make it about 40 horse-power. Will you give your rule?" The rule is this: Multiply the area of piston by the pressure in pounds to the square inch, and the product by the number of feet traveled by the piston per minute. Then divide this product by the unit for horse-power—33 000—which gives in this case 99·3347 horse-power.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Wanted—location for Portable Saw Mill—steady sawing, from one to five years. Address Marion Lumber Company, Midway, Washington county, Pa.

Woolen Mill Wanted at Coloma, Ill. See advertisement and address A. P. Smith, Sterling, Ill.

Manufacturers and Wholesale Dealers in Household Tin ware please send address to Robert Broome, Providence, R. I.

Printing Press Makers will oblige by sending their business card to Richard Yeomans, Printer, Cincinnati, Ohio.

Engine Lathe wanted, second-hand, 6 to 10 feet long. L. F., Box 131, Holly, Mich.



RAILROAD BRIDGE OVER THE SUSQUEHANNA AT HAVRE DE GRACE.

SCIENTIFIC AMERICAN.

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VOL. XVI., No. 22....[NEW SERIES.] ....*Twenty-first Year.*

NEW YORK, SATURDAY, JUNE 1, 1867.

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CAUTION.

It has become necessary for us to state very distinctly that the Scientific American Patent Agency Offices are at No 37 PARK Row, and not at No 39.

THE VOCATION OF THE ENGINEER.

Until within a few years the ultimate object of the recipient of a collegiate education was admission to the pulpit, the bar, or the domain of medicine. In fact to "go to college" implied an intention to become a "minister," a lawyer, or a doctor; but this has changed, and it is now not uncommon for graduates of our collegiate institutions either to settle down as mechanics or attempt the *role* of the journalist, the last position being one which they do not always fill with credit to themselves or advantage to the public.

But there is the vocation of the engineer which now opens a large field for educated young men. In England for many years the business of the civil and the mechanical engineer has been one of importance and lucrative. "Internal improvements," here some years ago a political catch-word, is there an established fact. Engineers in England have been for many years and still are highly valued, and their services are eagerly sought after in more than one department of the arts. It is beginning to be so here. Educated men capable of understanding those principles of science which lie at the foundation of the mechanic arts and who have a practical knowledge of those arts are greatly in demand. The extentensive works which are continually being undertaken by the government, corporate bodies, and individuals require for their successful prosecution talent, accurate knowledge, and perseverance, if not genius.

The rapid and general application of machinery to every department of industry, the employment of steam for so many purposes, the improvements in our means of communication open a field much too large for the laborers who are fitted to till it. The single department of architecture is demanding the most thorough knowledge of its laws and the talents of the best minds. In the construction of bridges, causeways, tunnels, roads, the designing and building of steamships with their huge machinery, the introduction of supplies of water to cities and villages, and many other works of a public and extensive character, something more than mere muscle or mechanical ability is called for. It demands intellect—the brain force—which in these operations is the prime mover.

Manufacturing establishments, which now are projected on a gigantic scale, often involving the expenditure of hundreds of thousands each, must be planned and controlled by comprehensive minds, thoroughly schooled to an intimate knowledge of mechanical causes and results. Mistakes in such works, arising from ignorance or incompetence, although under other circumstances trivial, may ruin an enterprise undertaken on a grand scale.

While we need more first class mechanics, capable of doing as well as directing, we require not less the planning and management of educated engineers, men who do not commit errors nor produce abortions. Proofs of this statement abound on every hand. The experiments of empirics without a particle of science—charlatans in mechanics—are altogether too common. Experiments are valuable only when guided by fixed principles and a knowledge of law, and this knowledge is attainable and should be gained by every one who aspires to a position of eminence either in mechanical or civil engineering.

For such a position a collegiate course is not always necessary; indeed, several of the most eminent engineers have been and are self educated. But the education is essential, whether obtained in the walls of a college or in the garret. There are not many young mechanics who do not have such an education within their reach. Time and a spirit of application are the chief requisites, and there are few boys or apprentices who have not the one and cannot cultivate the other. The opportunity is theirs, and certainly the incentive is not wanting. Already the vocation of the engineer is both honorable and profitable, and is rapidly becoming more so in both respects, while the study which prepares for it and the practice of the profession is singularly seductive and interesting.

THE BELT QUESTION.

On this subject we have received several communications, those from practical mechanics, with only one exception, endorsing our ideas expressed in our issues of February, 16th, March 30th and April 13th. We select from one of the many which agree with us the leading ideas, and give the amount of that one which objects to our misunderstood position.

W. H. B., of Mass., says: Your theory in regard to centrifugal force is unquestionably correct, but is it sufficient to account for the action of the belt? In any ordinary case is this force sufficient to overcome the tension of the belt? Let any one take a cone and wind upon it a strip of paper, or ribbon, beginning by holding the strip at right angles with the axis of the cone, the cause of the action of the belt will be sufficiently apparent without the aid of the centrifugal theory. I think a narrow or round belt would be subject to the same law as a wide one, etc.

J. W. T., of Ohio, says: Let any one take a cone (a tapering vial served my purpose,) and wind a strip of paper around it, commencing at the small end, and observe how rapidly it begins to approach the larger end if allowed to take its own course. In my opinion a belt runs to the largest part of a pulley for the same reason. The belt being endless and restrained by the other pulley, cannot follow this inclination as the paper can, but the tendency to do so causes it to curve edgewise slightly toward the largest diameter of the pulley, and this changes the direction of its motion just before it comes in contact with the pulley.

When we answered our correspondent in our issue of Feb. 16, we had no idea of accounting for every case of the running of belts. We said simply this; that "the *tendency* of belts as of a liquid on a revolving shaft is by centrifugal force to traverse the part furthest from the center." We did not say that no other element but centrifugal force entered into the problem. We merely stated that centrifugal force exercised a *tendency* to carry the belt to the highest point. No observant, practical mechanic will deny this, although theorists without practical knowledge may pit their notions against established and easily ascertained facts.

In reply to a correspondent we said, in our issue of March 30, "if only the stretching of the belt's edge compels it to traverse the highest point, it would seem that one edge being once curved, the time could not arrive when the strain would become equal on both edges, unless the belt passed its width entirely over the highest part of the pulley, when the belt would have attained its normal condition of straightness and again repeat the process of traversing transversely indefinitely." Again, in our issue of April 13th, we say: "the idea that the tendency of a belt to work to the highest portion of a pulley is caused solely by the stretching of one of its edges, does not appear to account for every case."

It will be seen that we did not offer the centrifugal theory as an *adequate* reason for the running of belts on the highest part of a pulley, but only as *one* of the reasons—that this force created a *tendency* in this direction. Both the correspondents whose articles we have used offer the same illustration, and both are wrong. They wind a ribbon on a cone and say that as the increasing diameter of this cone will take up an increased amount of this ribbon, therefore the running of a belt on the highest diameter of a pulley is accounted for. One, W. H. B., says the yielding nature of the substance of which belts are made will account for this movement toward the higher surface, or the larger diameter. Suppose he takes a steel tape, unyielding, the result in winding on a cone would be the same.

But it is one thing to wind a tape or ribbon on a fixed cone and another to run a belt on two pulleys revolving. In the one case there can be no centrifugal force; in the other there may be much. Whatever unpracticed theorists may affirm, every mechanic who has had experience with belts and pulleys knows, or may know, that centrifugal force—the power developed by rotation—has something to do with the running of belts, and this force is developed, in a measure, on slowly revolving shafts, and not entirely confined to those of rapid revolution, although in one case we may not be able to see the effect so apparently as in the other.

Other communications have been received on this subject, but as those from which we have quoted contain the ideas of the rest, there is no necessity of referring at length to them. If the stretching of a belt's edge alone accounts for the tendency to traverse the greatest diameter, why should not slow moving belts thus tend to that position? In one hundred revolutions performed in thirty minutes certainly a belt would stretch more than in one hundred revolutions performed in one minute; yet the slow moving belt will not tend to the crown of the pulley so much as the rapidly moving one.

EXPENSES OF A WEEKLY NEWSPAPER.

Few are aware of the expenses of publishing a leading weekly newspaper. We recently took occasion to sum them up, for one week's issue of the SCIENTIFIC AMERICAN—and it is the average of every week—and here give the figures for the benefit of any one contemplating a similar enterprise:—Editorial assistants, correspondents and reporters, $165; engravings, $240; composition (type setting) and proof reading, $150; paper (2½ tuns), $1,100; press work (printing), $175; envelope paper, wrapper writing and other mailing expenses, $110. Total per week, $1,940; total per year, $100,880.

The above being exclusive of office rent, heating, etc., and of the expense of conducting our extensive patent agency, which amounts to a much larger cost than that of publishing the paper. It will be apparent to our readers, as it is patent to us, that so large and handsomely illustrated sheet can be furnished at the low price of $3 per year only by having a very large subscription list. And it is by industry and energy on the part of its proprietors, for the past twenty-two years, that the SCIENTIFIC AMERICAN has attained its very large circulation, which is at least tenfold greater than that of any other paper of its kind in the world.

"FOUR YEARS' WORK OF A THOUSAND MEN."

The Susquehanna Bridge at Havre de Grace, an engraving of which appears on page 348, connects the hitherto severed portions of the Philadelphia, Wilmington, and Baltimore Railroad. It is located about half a mile above the mouth of the Susquehanna River, and about one quarter of a mile below the point of Watson's Island.

The line of bridge, which is a continuation of the line of railroad on the east side of the river, is at right angles to the general line of the stream. The river at this point is divided by the bar extending southerly from Watson's Island into two channels, the easterly of which has a depth of forty-nine feet, and the westerly of twenty-five and one-half feet, while at the point where the bridge crosses the bar the greatest depth is but five and a half feet below low water.

The piers which support the superstructure are thirteen in number and are of stone carefully laid in cement, within caissons of boiler iron which reach a point above the line of running ice. From this hight the piers are finished with cut stone laid in courses. The draw pier (No. 8) is circular, with a diameter of twenty-four feet eight inches at the top of the caisson, while each of the other piers has a width of eight feet and a length of thirty-five feet four inches at top of caisson, and a width of seven feet three inches at top of cut stone. Beside the piers which carry the superstructure, there are at the draw two guard piers, one above and one below, which serve to protect the draw from injury and to aid vessels in passing.

The piles for the pier No. 3, in the deepest water built in, were leveled at a depth of thirty-eight feet and five inches, and the piles for the pier No. 4, in the shoalest water built in, were leveled at a depth of four feet eleven inches below low water.

The abutments, two in number, are of cut stone. From low water to under side of chords at abutments is twenty-five feet eight inches, and the bridge rises by a regular curve from each abutment toward the center, making the distance from low water to under side of chords at piers Nos. 7 and 9, twenty-seven feet six inches.

The superstructure, which is for a single track, is of wood, built mainly on the Howe plan, with arches, and consists of twelve spans of two hundred and fifty feet nine inches very nearly in the clear, and a draw of one hundred and seventy-four feet nine inches.

The whole distance between abutments is three thousand two hundred and seventy-three feet and nine inches. On the west side of the river the bridge is connected with the old track by a piece of double-track road three thousand feet long.

The charter of the Susquehanna Bridge was obtained of the Maryland Legislature at the session of 1853. Surveys and examinations of different lines were made, and the building was begun in the same year, but in 1854, after some piles had been driven and some materials purchased, the work was suspended until 1862.

1862. Between the middle of June and the end of November full examination of the bed of the river was made, the plan of the piers was decided upon, the piles for piers 3 and 4 were driven and sawed off, and a portion of the masonry in caisson of pier 4 was laid.

1863. Work was resumed early in June and carried on until the end of December. During this season the whole of the masonry in caisson of pier 3 was laid, and a part of that above, the piling for pier 2 was begun, and the piles for piers 5, 6, and 7 were driven and sawed off.

1864. Work was resumed early in April and carried on until the latter part of December. During this season the piles for the east abutment were driven and sawed off, and a part of the masonry laid, piling for pier 1 was begun, piling at pier 2 was finished and sawed off, and the larger part of the masonry in caisson was laid; at piers 5 and 6 all of the masonry in caissons was laid, and the larger part of that above, and the foundation of west abutment was begun.

1865. Work was resumed in the latter part of March and continued until the end of December. During this season more masonry was laid at the east abutment, piling at pier 1 was finished and sawed off, and the whole of the masonry in the caisson, and the whole of that above it was laid; at pier 2 the rest of the masonry in caisson and the whole of that above was laid; at pier 3 more of the masonry above caisson was laid; at pier 4 the rest of the masonry in caisson and all of that above was laid; at piers 5 and 6 the rest of the masonry above caissons was laid; at pier 7 the foundation, the whole of the masonry in caissons and a part of that above was laid; at pier 9 the foundation and the whole of the masonry in caisson and the whole of that above was laid; at pier 12 the foundation and the whole of the masonry in caisson was laid; at pier 13 the foundation, the whole of the masonry in caisson and a part of that above was laid; at the west abutment the whole of the foundation was finished and a part of the masonry laid, and spans 1 and 2 of superstructure were framed and finished.

1866. The work was hardly interrupted by the winter. During this season the masonry of the east abutment, of piers 3, 7, 12, and 13, and of the west abutment was completed; at piers 8, 10, and 11 and at north guard pier the foundations, the whole of the masonry in caissons, and the whole of that above was laid; at the south guard pier the foundation was laid and the masonry completed above high water.

Spans 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13 of superstructure were framed, and spans 3, 4, 5, 6, 7, 10, 11, 12, and 13, and the bottom chords of span 9 were raised, when by a tornado on the 25th of July the whole of the superstructure except span 1 and the bottom chords of span 9 was torn from the piers and destroyed.

Spans 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13 were subsequently framed and raised so as to allow the crossing of a locomotive on the 20th of November, and on the 26th of November the bridge was so far completed as to allow of its being formally opened for travel. Since the opening of the bridge the work of completion has steadily progressed, and is now nearly finished, except the iron covering of the trusses, and the iron second story of the abutments, which are designed to flank the superstructure. These pieces of work will not be completed before another year.

The unstable nature of some parts of the bed of the river, together with the unusual depth of the water and the occasional violence of the ice freshets at the site of this bridge, are what have given the work a character of unusual engineering difficulty. The mode of constructing the piers was especially designed to meet this difficulty, and it has answered its purpose very perfectly. The masonry was laid within wrought iron water-tight caissons, which were fastened to timber platforms, and lowered gradually with the building of the masonry to prepared foundations of piles. The lowering was in some cases assisted by screws, and in others guided to the bottom by temporary guide piles. One of the piers was lowered by means of six 3½-inch screws, fifty-six feet long, to a pile foundation in water generally over forty feet deep.

The bridge was built after the plans and under the superintendence of Mr. George A. Parker, C. E., and receives the highest commendations of eminent engineers. It has been tested by a load of four times the weight of any train that can ever pass over it. Its cost was about $1,500,000, an immense amount for a single transit structure on a road of only one hundred miles, but the public will be great gainers in the shortening of the time of travel between Philadelphia and Baltimore, and in the absence of the danger to which all have felt exposed in making the passage on the immense train ferry-boat hitherto used.

THE NEW STEAM GUN CARRIAGE.

An interesting trial of the broad-side gun carriage, invented by James B. Eads, of St. Louis, took place last Thursday, in the presence of Commodore H. A. Wise, Chief of the Ordnance Bureau; Capt. Mullany and Commodore Buckner, ordnance officers of the navy; Mr. I. W. King, Chief Engineer of the Brooklyn Navy Yard, and Cols. Crispin and McAllister of the ordnance corps of the army.

The carriage supports one of the fifteen-inch navy guns weighing about 46,000 lbs. A steam cylinder 11 inches in diameter and 6 feet 4 inches stroke of piston, is secured between the gun slides of the chassis or lower carriage and parallel to them. The piston rod runs out in the direction of the port or muzzle of the gun, and is attached by its crosshead and connecting rods to the upper carriage which moves on the slides immediately over the cylinder. By a lever at the rear of the carriage steam is admitted to either end of the cylinder through a slide valve. The steam from the boiler is introduced into the carriage and exhausted from it, through the pivot on which the carriage is trained. A stop valve prevents the return of the steam to the boiler when under the compressing force of the recoil.

The gun was moved back and forth with great ease and rapidity, and was checked at each end of the stroke by the steam. When the gun is run into battery it is held there by the force of the steam in spite of the rolling of the vessel, until it is discharged or brought back by the operator. When the gun is fired the piston is sent back against the steam which cannot escape until the recoil is entirely checked. At this moment a self-acting device reverses the valve, the compressed steam is allowed to escape and steam from the boiler is introduced in the other end of the cylinder, causing the gun to start again in the same direction of the recoil, but at a gentle speed, until it is left completely at rest at the end of the stroke where the carriage comes against gum-elastic buffers. It is here held by the steam until the gun is reloaded when the operator runs it out again at will.

Solid shot were used weighing about 450 lbs., and a number of charges were fired varying from 35 lbs. to 55 lbs. each, of gunpowder of nearly twice the strength of the large grained cannon powder recently used in the experiments at Fortress Monroe. Four shots were fired against time in less than five minutes, one of them occupying but 45 seconds to load and fire.

The ball is raised by an ingenious device to the muzzle of the gun, by steam, where it is rolled into the bore of the gun by the men. To put the shot on the shot lifter and deliver it at the muzzle, required but six seconds of time..

A pressure gage and a pressure valve like the common lever safety valve were provided to test the pressure of steam in the cylinder. The initial pressure was 100 lbs. The cylinder was calculated to stand 2,000 lbs. per square inch.

The weight was placed on the lever of the valve at 400 lbs. The 45-lb. charges caused a pressure of 260 lbs. to be shown by the steam gage. The valve was unmoved. The concussion of the first 50-lb. charge broke the glass over the dial plate of the gage and disarranged it so that it was of no further use. The pressure valve was opened but whether from the effect of the steam pressure or from the jarring of the lever and pe was not fully determined. The pe was then set to indicate 500 lbs., and the valve was undisturbed until 55-lb. charges were used, when it was again opened. The pe was again moved out until a pressure of 700 lbs. was shown by it. Several charges of 55 lbs. were fired, and the inventor proposed to test it with 60-lb. ones. The Chief of the Bureau, however, was satisfied with the successful performance of the carriage without subjecting the gun to heavier charges, and expressed his willingness to accept it without further trial. All present seemed to be convinced that this method of working our large guns was the most rapid and reliable yet suggested.

It is to be regretted that more reliable means were not used to ascertain the pressure of recoil in the cylinder, as from such data could be calculated the exact power developed in recoil with different charges. A ball moving at 1,000 feet per second of initial velocity, weighing 450 pounds exerts a force equal to 450,000 foot-pounds. If the gun and carriage weigh 50,000 pounds, they will have an initial velocity of 9 feet per second and a force of 450,000 lbs., which must be absorbed before they are completely brought to rest. It is of course a question of strength of materials and of steam pressure, what size cylinder will be required to do this work. As the gun stands twenty or thirty thousand lbs. to the square inch, it is easy to make a cylinder of strength enough to check the recoil of the heaviest guns. But such data are needed to decide on the requisite diameter, thickness and length of cylinder required and the initial pressure of steam. A cylinder of 16½ inches diameter would have had only half the pressure withstood by the one in the trial. Compressed air can be used instead of steam, if desired, to work the gun.

GLEANINGS FROM THE POLYTECHNIC ASSOCIATION.

An item read by the chairman on the cure of hydrophobia, prescribing the rubbing of the wound with crystals of nitrate of silver, called forth some remarks as to the cause and treatment of the disease. Mr. Page believed it to be a nervous affection, and that a sudden and involuntary plunge of the patient into cold water would effect a cure. A member suggested that the experiment might be tried this summer on rabid dogs in confinement, for the possibility of securing a remedy is worthy the making of some such trials for testing its value. Mr. Reed narrated a case which came under his knowledge, where lockjaw in a jackass was perfectly cured by suddenly throwing the animal into cold water.

A microscope fitted with a Nicol's prism was exhibited, and its value to the chemist, in detecting in an analysis by means of polarized light minute organic salts, was fully set forth. The process of taking micro-photographs was explained, and some pictures of trichinæ, taken from pork and also the muscles of a human body, were shown.

Mr. Wright explained by means of a model the construction of a new life raft whose chief merits, beside its buoyancy were its light weight, its cheapness, and its compact form when not in use. The raft consists of six water tight cylinders of convenient size, connected together by a trellis framework: over the whole is a light platform of hinged boards. The trellis and platform may be folded up when not required for use, so that four of these rafts, each capable of saving fifty passengers, occupy no more space than one ordinary ship's boat. The standards which support the life lines, act also as bolts to connect the pontoon and deck. A mast and sail may be rigged at leisure after launching. The provision tank is so arranged that sea water can never injure the food.

Dr. Rowell explained a new process of making oval picture frames, of curved veneers of black walnut, whereby the same shade and gradations of color are continuous throughout, and a frame of great beauty and strength is cheaply made.

Dr. Bradley followed with an elaborate essay on electricity and telegraphic instruments. He entered into a minute description of the several galvanic batteries employed in telegraphy, pointing out the defects of each, and referring particularly to the merits of Hill's battery, now coming into general use. The remainder of this voluminous paper was substantially a repetition of the article read at a meeting of the Association some months since, in connection with the presentation of his anthistometer, or measurer of resistance, and reported at length in these columns at that time. The speaker introduced an imposing array of figures and formulas unintelligible to the majority of the audience, by way of proving the truth of Ohm's law concerning the retarding power of the electrical battery.

After a brief dissussion of Dr. Bradley's paper the Society listened to the reading of an article by Dr. Feuchtwanger on gypsum, its nature, geological formation, and the region of country through which it is found. These remarks were preliminary to an account of a late visit to the immense gypsum deposits near Windsor, Harts county Nova Scotia. The gypsum beds of this vicinity is one hundred and fifty feet wide, and probably not less than fifty miles in extent, this being the largest deposit in the world. From this locality, he stated, 100,000 tuns of plaster of Paris are annually exported.

ELECTRICAL ANTI-INCRUSTATORS.

The first application of electricity to steam boilers was made by Mr. Perry of Philadelphia, who in 1864 petitioned for a patent for suspending a magnet in the boilers to induce an electric current and thereby to prevent boiler explosions. Electricity and magnetism considered by him as identical, have too often been confounded; though indeed related, as are light and heat, it would be equally absurd to attempt the illumination of a room from boiling water as to admit the claims of this inventor in getting electricity from a magnet. Rejected on his first application, a patent was finally granted to him in 1865. On the same month a patent was also issued to Mr. Porter of Philadelphia, for getting rid of the explosive electricity. An unexpected result, it is asserted, was obtained by the use of this invention, namely, the boilers remained free from incrustations. Some fifty years ago Humphrey Davy sought to prevent corrosion of the copper coating of vessels by sea water, by soldering pieces of zinc against the copper sheathing. A galvanic current was set up which preserved the copper at the expense of the zinc but as a set-off to this protection, it was found that deposits of marine vegetation, were always formed against the copper. A few years ago, Webster and Young applied this principal for preventing boiler incrustation. A plate of copper suspended in the water, would, it was expected, by galvanic action receive the salt from the water, as the copper coating took up the ocean deposits, but as this deposit on ships was formed at the expense of the zinc, so here the iron was corroded and destroyed.

These remarks were prefaced by Prof. Vander Weyde, to the presentation of a plan of his own for establishing simple electric repulsion between the shell of the boiler and the particles of solid deposit, so that they are prevented from adhering to the boiler. It is a well known fact that that vapor of water containing salts in solution is always positively electric. Most deposits are also positively electric. Now by suspending pointed wires, like lightning rods, from inside the boiler, above the water, the positive electricity from the steam will be collected and again diffused through the boiler, and as electricities of the same name repel each other, the positive electrical salts can not be deposited and incrustation will be prevented.

Machine Tools.

It is remarked in *Engineering*, that the patterns of self-acting tools have acquired within five years a remarkable uniformity all over Europe. At the London Exhibition of 1862, the first signs of this conformity were seen in sets of machine tools from Saxony, which were such close copies of the English as to be hardly distinguishable without close inspection. The Chemnitz manufacturers who began thus, went on, buying the English tools without disguise, copying them with minute fidelity, and even casting direct from their parts In France, the *Conservatoire des Arts et Métiers* began the collection of designs of English machines, and invited all manufacturers to take copies of them. Their complete drawings of the English machines exhibited in 1862, actually included many better and more accurate than the makers themselves possessed. The French makers, however, have departed from the models more frequently than the Germans, with variations which our English contemporary considers mostly clumsy or obsolete. American tools are credited with a more distinct and original character, "placing them on a totally different level from mere imitations," although the excellences of the English styles are not neglected, and several of our makers are said to compare favorably in the present Exposition with any in Europe.

Telescopic Discovery.

We are informed that a new double star, supposed to be below the defining power of more than two or three telescopes in the world, has been observed by means of the fine instrument in the possession of Jacob Campbell, Esq. of Brooklyn. It is almost in a line between Procyon and the companion star by which the defining power of first class telescopes is frequently tested- But although it is a common practice of astronomers to try their glasses by first observing Procyon and then waiting a few minutes for the companion star to come into the field, this new companion, which enters the field before the other, had never been revealed by any of the instruments so often crossed by it. Professor Winlock, the astronomer at Cambridge, was informed of the discovery, and after some search with the fine Munich telescope of that observatory, detected the new star, although at first as elongated, not double. The success of European instruments with the new test, is yet to be heard from. The remarkable quality of Mr Campbell's telescope (a twelve inch lens, three inches smaller, if we mistake not, than that of the Munich instrument at Cambridge) is due to the well known skill of Mr. Clark of Cambridgeport, who has been engaged for months in correcting and perfecting it.

HON. D. A. WELLS, Commissioner of Revenues, sailed on Saturday, 18th inst., for Europe on an official mission. Mr. Wells will visit the large manufacturing towns of England and investigate their system of manufacture, time required of the operatives, their pay and social condition. He will also investigate the English system of raising revenues, all of which will be reported to Congress at the next session. Mr. Wells is a keen observer, an indefatigable worker and a gentleman every way fitted for the important office he so acceptably fills. Mr. Wells expects to return in September.

CHEAP LECTURE DIAGRAMS.—Prof. Kick, of the Prague Polytechnic Institute, proposes the following way of preparing inexpensive diagram boards for lecture-room purposes. A sheet of stout brown paper is first coated with thin glue in which is mixed a quantity of lamp black and powdered pumice stone. After the application of two coats of this composition the design is traced with French chalk, the lines afterward to be gone over with ordinary chalk or colored crayons. To fix the drawing the inventor by means of a "vaporiser" or spray apparatus projects water in a finely-divided state over each line; the glue is thus softened and allows the chalk to sink into it, and when dry forms a protecting varnish. Diagrams so prepared can be rolled up and rubbed without damage, and corrections may be made with great facility.

Patent Claims

ISSUED FROM THE U. S. PATENT OFFICE
FOR THE WEEK ENDING MAY 14, 1867.
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.

64,618.—CHURN.—William Alexander, Union Valley, N. Y.
I claim the dasher, D E, constructed substantially in the manner herein shown and described and for the purpose set forth.

64,619.—PLOW.—Darwin Almy, Tiverton Four Corners, R. I.
I claim the arrangement of the lever, D, the rod, b, and the links, c c' and g, connected with the guide wheel, E, for regulating the depth of the furrow of a plow, operating as herein described.

64,620.—WELL-BORING AND DRILLING MACHINE.—Charles W. Atkeson, St. Louis, Mo.
I claim the attachment of the chain drum, J, gearing, K L, and wheel, M, to the walking beam, substantially as herein described and for the purpose specified.

64,621.—CATTLE TIE.—E. P. Banks, Portland, Me.
First, I claim the combination of the bolt, d, clamp, a, and bow, b, when constructed as set forth in Fig. 1, for the purposes specified.
Second, The combination of the bolt, d, clamp, a, and bow, b, when constructed as set forth in Fig. 3, and for the purposes specified.

64,622.—VESSEL FOR MALTING AND BREWING.—Chas. Berckhemer, Cincinnati, Ohio.
I claim a perforated bottom or other metallic portion of a brewer's or malt-ster's vessel, composed of cast or wrought iron electroplated, as set forth.

64,623.—BLOTTING PAD.—Reinhold Boeklen, Brooklyn, N. Y. Antedated May 3, 1867.
First, I claim the employment or use of a flexible board or bottom to the blotter, operated and for the purpose substantially as herein described.
Second, The employment of the slides, D D, combined with the wedge-shaped ends of the blotter board, A, operated and for the purpose substantially as herein shown.

64,624.—PAPER FILE.—Reinhold Boeklen, Brooklyn, N. Y.
First, I claim the employment of one or more slides, I, or flaps, K, in combination with the file books, operated as and for the purpose substantially as herein shown.
Second, The construction and arrangement of the spring plates, B, and its guide, F, in combination with the back board, A, operated in the manner and for the purposes substantially as herein described.

64,625.—FLOUR BOLT.—Benjamin Boorman (assignor to himself and Isaac Lain), Waukesha, Wis.
I claim the strips, a, of the bolting cloth, E, secured to the parallel arms, D, of the revolving flour bolt, A, by means of the strips, b, in such a manner that the said strips, a, shall be flush with the inner surface of said slats, D, as herein set forth for the purpose specified.

64,626.—CARRIAGE SHACKLE.—James Brennan, New Haven, Conn.
I claim the combination of the two parts, C D, hinged together at the rear, and secured at the front by a screw, E, as and for the purpose specified.

64,627.—POTATO DIGGER.—Thomas and George Burdett, Dansville, N. Y.
I claim the arrangement of the fork, D, with the axle, A, bar, C2, of the frame, C, and wheels, B, when all are constructed and operating as herein set forth.

64,628.—STUMP EXTRACTOR.—David Carroll, Union, Pa.
First, I claim the pulleys, E G and I, in combination with the chains, M and N, substantially as shown and described and for the purposes set forth.
Second, I claim the castors and shoes, R R R, in combination with the derrick, substantially as shown and for the purposes set forth.

64,629.—COTTON PICKER.—J. E. Carver, Bridgewater, Mass.
I claim the reciprocating tongue, B, one or more placed within a box, A, and armed with reflex spines or teeth, and used either with or without the toothed plate, E, substantially as and for the purpose set forth.

64,630.—COTTON PRESS.—F. A. L. Cassidey, Newmansville, Fla.
First, I claim the suspended slotted packing case or cylinder, B, or equivalent, in combination with the frame, A, substantially as herein shown and described.
Second, The combination of the ratchet bar, D, spring, E, and rods, C, with the packing case, B, substantially as herein shown and described.
Third, The combination of the piston head, I, with the packing case, B, and rods, C, substantially as herein shown and described.
Fourth, The construction and arrangement of the bottom, F, hinge, G, and catch, H, on the lower end of the packing cylinder, B, as herein set forth.

64,631.—WAGON-WHEEL LOCK.—Thomas G. Clifford, Derby, Conn.
I claim the arrangement of the bolts, I, in combination with the plates, F, and the shaft, G, with its ratchet, b, constructed and arranged to operate substantially in the manner herein set forth.

64,632.—BEDSTEAD.—George G. Cochran, Brooklyn, N. Y.
I claim the rods, D D', at each side of the bedstead, provided at their inner ends with right and left screw threads, connected by nuts, E, and attached to their outer ends to the posts, A, by the hooks and eyes, c d, and the knobs, e, and hooks, f, in combination with the tenons, b, on the ends of the rails, c, and the mortises, a, in the posts, A, substantially as and for the purpose set forth.

64,633.—SLEIGH BRAKE.—Frederick Cohlmeier, Keck's Center, N. Y.
I claim, First, An improved sleigh brake formed by the combination of the draft bars, F, supporting bar, G, bent levers, H, and dogs, I, with each other, and with the frame and tongue of the sleigh, substantially as herein shown and described and for the purpose set forth.
Second, The combination of the bar, M, and levers, N, with the draft bars, F, and with the frame of the sleigh, substantially as herein shown and described and for the purpose set forth.

64,634.—SPRINGS FOR VEHICLES.—D. L. Columbia, R. V. Stocking, and C. W. Woodruff, Morrison, Ill.
We claim, First, Suspending the bodies of vehicles upon bands of india rubber, so applied that the action of the load shall take effect in the elongation of the springs, and it be raised by their contraction, substantially as described.
Second, The combination of the india-rubber bands, H, standard, D, and oscillating lever, E, substantially as and for the purpose set forth.

64,635.—LOCK FOR CAR DOORS, ETC.—George B. F. Cooper New Albany, Ind.
I claim the catch bolt, D, in combination with the sliding bolt, B, operated by the thumb pawl, c, to lock or secure the fastening without employing a key, arranged substantially as herein described.

64,636.—METHOD OF TRANSPORTING CARS THROUGH TUNNELS.—John H. Crane, Charlestown, Mass.
I claim the method of transporting cars through tunnels, by means of traversing cars, having rails upon their platforms, which rails connect with the railway tracks at the opposite ends of the tunnel, substantially as set forth.
I also claim making the cars, c, sectional and jointed, substantially as described.
I also claim the hinged or swinging rail platform, h, made to swing up from, or to be swung over upon the cars, substantially as described.

64,637.—PRESSING BRICKS.—Horace Crofoot, Oak Park, Ill., assignor to himself and T. W. V. P. Mercereau.
First, I claim the fixed mold plate, J, and reciprocating plungers, F I, when arranged to operate as shown, or in an equivalent manner, so that the clay after being subjected to one pressure in the molds, f, will be raised therein to their wider parts, and subjected to a gradual pressure by both sets of plungers, in order to expel the atmospheric air from the clay, substantially as described.
Second, Providing the upper plungers, F, with convex faces, d, when said plungers, thus constructed, are used in connection with molds, f, having inclined sides, and also used with a set of lower plungers, I, to raise the clay in the molds, after being subjected to one pressure, substantially as and for the purpose set forth.

64,638.—COATING FOR IRON SHIPS AND OTHER STRUCTURES.—Francis Cruickshank, Edinburgh, Great Britain.
I claim the preparing of an improved anti-fouling coating, with the mercurial compounds hereinbefore specified, and substantially in the manner hereinbefore described.

64,639.—GUARD FOR RAILWAY CARS.—Felix Manuel Daunoy, New Orleans, La.
I claim the application of a gum rubber drum in front of every wheel of a horse or steam car, as herein described.

64,640.—CAR TRUCK.—J. Q. A. De Huff, Summitville, Iowa.
I claim the arrangement of the double-cogged segments, e, hung in the cross frame, F, between the curved guides, E, combined with the springs, d, slot, c, racks, g, the boxes, b, and the axle, C, arranged and operating substantially as and for the purpose described.

64,641.—FIELD FENCE.—Frederick Dickinson, Geneva, Ohio.
I claim the special construction and arrangement of a fence for the purpose and in the manner set forth.

64,642.—CAR WHEEL.—John V. Dinsmore (assignor to himself and Moses Harris), Milford, Mass.
I claim the arrangement of the elastic packing or ring, B, the inelastic tire, C, the body, A, the end supporters, D E, and devices substantially as described, or their equivalents, for preventing the tire from slipping around on the elastic ring, and enabling such tire to vibrate and play in radial directions, as specified.

64,643.—SAW.—Henry Disston, Philadelphia, Pa.
I claim the recess, e, in the blade, for the reception of a detachable tooth, in combination with holes, t t, bored in the blade, and arranged in respect to the corners of the said recess, substantially as and for the purpose herein set forth.

64,644.—UTERINE SUPPORTER.—D. Dodge, M. D., Rockford, Ill.
I claim the sleeves, D and C, jointed to the pad, in combination with the tube, B, and springs, H I, substantially as and for the purpose set forth.

64,645.—CUPOLA FURNACE.—James Dougherty, Philadelphia, Pa.
First, I claim a cupola or blast furnace, the interior of the lower portion of which is composed of the chamber, G, with vertical walls, and above the latter the basin-like chamber, F, constructed at the top, all substantially as specified.
Second, The combination with a cupola or blast furnace of a system of tweers having openings so arranged as to discharge a blast of greater volume below than above, as set forth.
Third, The air openings, w, arranged in respect to the projections, m, and basin-like chambers, F, as described.

64,646.—OIL CUP FOR MACHINERY.—William Douglas and H. M. Ingler, Bellair, Ohio.
First, We claim the cone-feeder, D, constructed and arranged substantially as described for the discharge of the oil upward by the motion of the engine crank.
Second, We claim the arrangement substantially as herein described for oiling the wrist-pin directly in combination with an upward feeding oil-cup

64,647.—PLOWS.—James C. Duncan, Olney, Illinois.
First, I claim a plow, embracing the mold board, A, landside, B, border, or sole, C, and heel brace, D, all being united in one end, and the same piece of metal which is cut and shaped substantially as described and represented.
Second, I claim the slotted rest, D', when formed in one piece with the plow, and employed for the support of the beam, G, substantially as and for the purpose specified.

64,648.—PORTABLE FENCE.—James C. Duncan, Olney, Ills assignor to himself and J. B. Alexander, Washington, D. C.
I claim the supporting trestle, consisting of the battens, C C, braces, E E, pins, D, rails, A, and cross-tie, F, combined substantially in the manner and for the purpose specified

64,649.—LINIMENT.—James C. Dustan, New Vernon, N. J.
I claim an improved liniment, composed of the several ingredients combined in the proportions and manner substantially as and for the purposes herein specified,

64,650.—BREECH-LOADING FIRE-ARM.—Julius Elson, Boston, Mass.
First, I claim the combination, as well as the arrangement of the advancer, H, and its cam, q, or operative mechanism with the hammer and the breech block applied to the barrel and stock, and with the mechanism as described for elevating or depressing the breech-block, C, and bolting and unbolting it with respect to the barrel substantially in manner as specified.
Second, I also claim the combination as well as the arrangement of mechanical parts or instrumentalities for elevating and depressing the breech block, C, and bolting and unbolting it with respect to the barrel in manner as set forth, such parts or instrumentalities consisting in the hammer, E, its pin, f, and arm, g, the lever or arm, e, stud, e, spring, D, the bolt, F, and its operative mechanism, substantially as described.

64,651.—CHERRY SEEDER.—Lot P. Evans, Springville, Pa.
I claim the cylinders, b b', and the plates, d d', arranged and operating with respect to each other, substantially as herein specified and described.

64,652.—COMBINED TOOL.—Gilbert J. Ferriss, Washington, D. C., assignor to himself and Byron Sykes.
I claim the tool as above described, operating in the manner and for the purpose set forth.

64,653.—ENVELOPE.—Edward Fitzki, Washington, D. C.
I claim the application of incisions in the envelope of any size, style or materials as fully described as above.

64,654.—INSULATOR.—George Floyd, Cincinnati, Ohio.
I claim the chambered insulator provided with ledges, H H', approached by a flaring aperture, F, in the described combination with the two parted and shouldered shank, the said shank and chamber being oblong in their horizontal section all substantially as set forth.

64,655.—ROAD SCRAPER.—P. S. Foster, Richmond, Maine.
I claim, First, An improved scraper, A, having tilting or pivoted bottom board, a2, and being adjustably pivoted to the runners, B, constructed and operating substantially as herein shown and described and for the purpose set forth.
Second, The combination of the inside scraper, G, and pinted rods, g2, with the scraper, A, substantially as herein shown and described and for the purpose set forth.
Third, The combination of the crank-shaft, H, and ropes or chains, I, with the scraper, A, and inside scraper, G, substantially as herein shown and described and for the purpose set forth.

64,656.—PIPE WRENCH.—Moses H. Freeman, Somerville, Mass.
I claim the combination as well as the arrangement of the clasp, D, and spring, H, the tooth, a, the series, C, of notches the jaws, E A, and the bar B.
I also claim the combination as well as the arrangement of the lever, F with the clasp, D, the spring, H, the tooth, a, the series, C, of notches, the jaws, E A, and the bar, B, such bar being provided with a handle, and the whole being constructed so as to operate substantially as hereinbefore explained.

64,657.—CULTIVATOR.—Andrew Friberg, Moline, Ills.
I claim securing the share to the stock by means of the block, C, and stirrup, e, when said parts are constructed and arranged substantially as herein shown and described.

64,658.—BENCH-VISE.—Charles R. Gibson, Madison, Ind.
I claim, First, The combination of the jaws, A A', with the universal jointed vise screws, B C D, and nut, F, all constructed and arranged substantially as described.
Second, The combination of the jaws, A A', the stirrup, f f, block, G, and pin, K, all constructed and combined as set forth.

64,659.—FIRE-PROOF CEILINGS AND ROOFS.—Joseph Gilbert, Philadelphia, Pa.
I claim, First, A ceiling or roof composed of girders, A, corrugated arched plates, B, and socket bearers, d, adapted to the said girders and plates, the whole being constructed and arranged substantially as described.
Second, In combination with the above, I claim the bricks or blocks, X X, applied in the manner and for the purpose described.

64,660.—ROD CUTTER.—J. E. Gillespie, Boston, Mass.
I claim a rod cutter constructed and operated substantially as specified.

64,661.—WINDMILL.—C. C. Gish, Virden, Ills.
First, I claim a wind wheel constructed substantially as shown and provided with hinged wings, d, and rods, e, sliding hubs, D E, arranged in relation with water receiver, L, and loaded lever, G, substantially as shown and described for the purpose specified.
Second, The float, F, in tank, Q the valve, N, in the water-receiver, L, and the lever, G, all arranged to operate in connection with the wind-wheel, substantially as described.

64,662.—COMBINED HAMMER, SCREW-DRIVER, AND WRENCH.—Willis D. Gold, Philadelphia, Pa.
I claim a combined hammer, screw-driver, and double wrench having the characteristics and operating substantially as represented and described.

64,663.—FLOAT VALVE.—J. H. Guild, Rupert, Vt.
I claim the arrangement in the perforated vessel, A, of the float, B, having the perforated or notched vertical rod, b, engaging with the pivoted oscillating lever, c, connected by the link, d, to the lever, e, pivoted to the opposite side of the vessel, in such a manner that as the float, B, is elevated by the water, the projection, f, upon said lever, e, presses against the elastic pipe, C, effectually closing the same, substantially as described for the purpose specified.

64,664.—NIPPER.—Thomas G. Hall, New York City, assignor to himself and C. E. McDonald, Brooklyn, N. Y., said C. E. McDonald assignor to E. Harvey Gifford, Brooklyn, N. Y.
I claim the lever, D, handles, F and F, toe, b, spring, t, jaws, B C, set screw, h, constructed, arranged and operating substantially as and for the purpose described.

64,665.—TURN-TABLE.—Freeman Hanson, Buxton, Maine.
I claim the arrangement of the plate, c, having its projections, f, its part, h, and wheels, d, plate, b, and projection, g, all as and for the purposes described when the said plate, c, is operated by means of the four screws, k, in the manner herein set forth.

64,666.—ATTACHING AND DETACHING HORSES, ETC.—John K. Harris, Madison, Ind.
I claim, First, The horse-hitching device releasible by the driver, consisting essentially of the hooked plate, B, self-engaging bolt, E, and buckle, R, substantially as set forth.
Second, The buckle proper, consisting of the double tubular frame with the pair of spiral springs, P P', and the draw-bar, O, substantially as described.

64,667.—DESTROYING INSECTS ON TREES.—James Hatch, Lynn, Mass. Antedated May 1, 1867.
I claim the fumigating furnace, c, pan, d, pipe, e, and rack or cloth, b, when used together in combination, substantially as and for the purpose specified.

64,668.—CULTIVATOR.—A. T. Heflin, Monmouth, Ills.
I claim, First, Forming the shovels, I, with wings, the outer wing of each shovel being curved or turned up substantially as herein shown and described and for the purpose set forth.
Second, The combination of the pivoted bar, D, with the beam, G, and vertical bar, a', of the frame, A, substantially in the manner shown and described and for the purpose set forth.

64,669.—MANUFACTURE OF VINEGAR.—John Higbie, Rondout, N. Y.
I claim the improved process for the manufacture of vinegar from apples, substantially as shown and described.

64,670.—SEED PLANTERS.—George A. Hill and Conrad Lohnes, Springfield, Ohio, assignors to themselves and James M. Harner, Donnelsville, Ohio.
We claim, First, The combination of the double sided plough curving upwards from near the point to the heel and the shovels, O, adjustably attached thereto substantially as and for the purpose set forth.
Second, The combination of the wheel, D', adjustable pins, D', lever, E, and spring E', substantially as described.
Third, The combination of the lever, E, valves, F and F', and pins, F2, with the compound lever, G, having curved slots, G', in the outer ends substantially as set forth.
Fourth, The combination of the compound lever, G, valves, F and F', connecting bar, H, lever, J, hook, I', and driver's seat, K, substantially as described.
Fifth, The combination of the driver's seat, K, lever, P, cam, Q, and tongue, R, substantially as set forth.
Sixth, The combination of the tongue, R, attached to the rear of the frame and the brace, T, attached to the front thereof, and constructed and arranged to operate substantially as set forth.

64,671.—FLAME REGULATOR AND EXTINGUISHER FOR LAMPS.—William H. H. Hinds, Groton, Mass. Antedated May 1, 1867.
First, I claim the attaching of two pieces of metal made to close together around or above the flame to a cap to which cap is attached a collar or chimney holder when a chimney is used in such a manner that the said two pieces of metal shall form the vertex or top or a part of the vertex or top of said cap as herein described and as shown in figs. 1 and 2.
Second, The closing and opening of the said two pieces of metal by means of a collar or chimney holder as herein described and as shown in figs. 1 and 2.

64,672.—APPARATUS FOR PRODUCING GAS FROM PETROLEUM.—Heinrich Hirzel, Leipsic Saxony.
First, I claim the pumps V, and feed pipes Q, feeding the petroleum in a continuous jet to the retorts A, in combination with said retorts substantially as above set forth and described.
Second, The clockwork mechanism N, or its equivalent for working the pumps V, in combination with said pumps operating in the manner and for the purposes substantially as set forth and described.
Third, The wings R, regulating the clockwork mechanism N, in combination with said clockwork.
Fourth, The condenser E, combined with the connecting tube F, the latter setting into the hydraulic main C, where the bench consists of more than one retort or where one only is employed the condenser E, furnished at its bottom with an hydraulic main substantially as set forth and described.
Fifth, The hydraulic main C, in combination with the excess pipe or discharging tube, O, stand pipes, B, bell valves, D, and connecting tube, F, or their respective equivalents all substantially as set forth and described.
Sixth, The trapped tube I, in combination with the condenser E, and cistern G, substantially as described.

64,673.—PORTABLE WATER CLOSET OR ANOSMIA.—James G. Holmes, Charlestown, S. C.
First, I claim in a portable water closet constructed substantially as described, I claim the use of an exterior upright vessel and of an interior inverted vessel so arranged as to prevent the escape of any fetid odor by means of a water packing extending to the lower portion of the exterior vessel, substantially as described.
Second, As a new article of manufacture a portable water closet which is rendered inodrous by means of a closed inverted vessel with its water packing which extends to or below the bottom of the vessel which is to contain the fæces, substantially as and for the purpose described.
Third, In a portable water closet, I claim the rendering of the same, effective by means of an external vessel, an internal inverted vessel packed with water while the vessel to receive the fæces is separate and distinct from either of the others substantially as desdribed.

64,674.—EXPRESS MONEY ENVELOPE.—E. Hulbert, Atlanta, Ga.
First, I claim the improved express money envelope formed with additional flaps b1 b2, et e2, upon the side edges of the end flaps B, and B, substantially as herein shown and described and the purpose set forth.
Second, Forming holes through the side flaps D and E, in such positions that when the said flaps are folded and pasted down said holes may correspond with each other to allow the sealing material to come in contact with the end and side flaps at the same time substantially as herein shown and described.

64,675.—BEE HIVE.—Lafayette Kramer, Point Pleasant, Pa.
In a double bee-hive I claim the combination and arrangement of the case A, with the hinged lid B, and hinged door C, enclosing the shifting boxes 1 2, in pairs separated by the partitions a, and connected with the surplus honey boxes D D1 D2, substantially as and for the purposes herein described.

64,676.—WRENCH.—Wm. H. Landbeck, Rochester, N. Y.
I claim the oblong plate F, and spring E, the whole arrangement in the manner and for the purpose substantially as herein described.

64,677.—HOT AND COLD AIR BATHS.—Simon M. Landis, Philadelphia, Pa.
First, I claim the falling shutter a, with slide c, as set forth.
Second, Foot stool L, and seat stool 11, lined with tin or zinc, as set forth in combination with the bath room.
Third, Slides 2 and b, and double door E, and D, as set forth.
Fourth, Double inclined floors 6 6 and 7 7, as described and set forth.

64,678.—FRUIT DRYER.—Charles Leavitt, Cleveland, Ohio.
I claim the herein described arrangement of the channels or flues C C', and D, in combination with the pipes K and O, case A, for the purpose and in the manner set forth.

64,679.—HOP FRAME.—Joseph C. and Delos P. Leonard, Union City, Mich.
We claim our improved hop frame or trellises, constructed of inclined stakes or poles D D, supported by horizontal wires or chains A, stretched and secured as herein described all substantially in the manner and for the purpose herein set forth.

64,680.—STEAM GENERATOR.—Thomas C. Little, Dixon, Ill.
First, I claim the inner shell B, placed concentrically within the outer shell A having a flue J, between them for the passage of the products of combustion from the fire chamber G, the inner shell B, provided with a circular plate suspended from the rod N, against which the water from the injection pipe C, is thrown substantially as described for the purpose specified.
Second, The combination and arrangement of the shells A B, injecting pipe c, connecting pipe D, fire box G, and circular plate suspended from the rod N, substantially as described for the purpose specified.
Third, I claim the fire box constructed as described.
Fourth, I claim the arrangement of the arm a, the connecting rod c, and the crank b, by which the valve is operated in combination with pipes D and C, for the purposes set forth.

64,681.—PEAT MACHINE.—Charles Luxton, Hudson, N. J.
I claim the octagon roller, in combination with the lever for compressing peat, fuel or for making bricks.

64,682.—ALARM GUN.—T. E. Marable and Grey Utley, Petersburg, Va.
We claim the combination of the horizontal and radial barrels, when fired at the center by a single cap, and vertical hammer in the top of the box, arranged and operated as herein set forth.

64,683.—MOP HEAD.—H. H. Mason and Joseph Messenger, Springfield, Vt.
We claim the connecting of the movable jaw, D, to the nut, C, by means of the right and left screw threads on the ends of the jaws, D, fitting in right and left female or internal screw threads, m, ears or projections, c c, on the nut, C, substantially as shown and described.

64,684.—STREET-LAMP LIGHTER.—M. McGill and Joseph E. Tynan, Paterson, N. J.
We claim a hand lantern constructed as and for the purposes described.

64,685.—KETTLE.—Allen N. Merrill, Batavia, Ill.
I claim the eccentric hinge, E, the lip, F, the slide bolt, G, and the wood handle, H, in combination with the cover, B, the arms, C D, and the kettle, A, substantially as described.

64,686.—MACHINE FOR GRINDING SCALE PIVOTS.—Frederick Meyer, Newark, N. J.
I claim the construction and arrangement of the longitudinally sliding carriage, C, reciprocating carriage, D, and carriage, E, as herein set forth for the purpose specified.
Second, Adjusting the scale pivots to be ground on both sides by means of the set screws or pins, k l, secured to the arm, i, of the sliding carriage, E, and bar, H, upon the frame, A, substantially as herein set forth.

64,687.—KNIFE SHARPENER.—James Meyer, Jr., New York City.

I claim, First, The cutting plates, E E, provided with longitudinal rounded edges and connected together by a sliding joint, substantially in the manner as and for the purpose set forth.

Second, The combination of the handle, A, with the two pairs of cutters, E E F F the clamp at one end of the handle and the recesses in the same to receive the cutters, with or without the strap, G, substantially as and for the purpose specified.

64,688.—FIBROUS PACKING FOR STEAM ENGINES.—Wm. H. Miller, Philadelphia, Pa.

I claim a packing consisting of a hemp, cotton, or other fibrous filling made into the form of a hart or roving and covered with a fibrous cover, substantially as described.

64,689.—CAR COUPLING.—Thos. S. Minniss, Meadville, Pa.

I claim a stop or hook that will hang on top of the drawhead and swing by its own gravity across the pin hole, which in combination with the pin when it is dislodged will make a complete counterbalance to the projecting end of the link to hold it horizontal, being a catch, trigger, and weight combined in a single piece, constructed and operated as and for the purpose set forth.

64,690.—THROTTLE VALVE.—Geo. Fred. Morse, Portland, Me.

I claim the arrangement of the partially balanced sliding throttle valve in its casing by means of its cylindrical form and by having the steam openings on one side and the channel, d, on the other side of the valve open to the admission and pressure of the steam to more than balance the area of the ports, so that the valve shall be pressed against the steam openings in the seat, but with so slight a pressure as to cause but little friction and require but little force to move it.

64,691.—MANUFACTURE OF SHOVELS.—H. M. Myers, Allegheny City, Pa.

I claim a blank for a shovel blade and handle straps when said blank is cast of steel, substantially as herein described and for the purpose set forth.

64,692.—PRUNING SHEARS.—John Neff, Jr., Pultney, N. Y.

I claim the lever, C, and spring, D, when made and arranged substantially as specified and used for the purpose set forth.

64,693.—BUCKLE.—Thos. L. Ogier, West Chester, Pa.

I claim the combination of the two parts, a f, pivoted to each other and furnished with the roughened surfaces, c i, for catching and clamping a leather or other flexible strap, substantially as and for the purpose described.

64,694.—FOLDING SEAT.—A. M. Olds, New York City. Antedated May 5, 1867.

First, I claim the combination of the legs, A A A, band, E, and rings, B B B, arranged substantially as and for the purposes set forth.

Second, The combination of the legs, A A A, plugs, L L L, and seat, M, substantially as and for the purposes described.

64,695.—SWEEPING MACHINE FOR RAILROADS.—E. A. F. Olmstead, New York City.

I claim the construction and arrangement of the levers, L M, of the same length, their inner ends slotted and pivoted together and to the stirrup, O, working vertically in the slotted support, P, and adjusted by means of the hand screw, Q, said levers near their outer ends pivoted to the supporter, N, upon the platform, A, and their outer ends pivoted to the rod, R S, attached to the ends of the shaft, K, respectively, whereby the said shaft and broom, G, are raised and lowered, substantially as herein set forth, for the purpose specified.

64,696.—COTTON-BALE TIE.—Wm. Onions, St. Louis, Mo.

I claim the metal block, A, in combination with the wedge shaped metal piece, B, secured to the bale hoop end, C, arranged and operating substantially as and for the purpose set forth.

64,697.—MANURE DISTRIBUTOR.—H. S. Palmer, Norvell, Mich.

I claim, First, The cam pulley, H, the arm, I, and the hinged board or frame, G, when constructed and operating in the manner and for the purpose as herein specified.

Second, The cam pulley, H, in combination with the arm, I, when so constructed that the pulley can be moved nearer to or further from the fulcrum, whereby the discharge may be regulated by altering the stroke of the teeth, J.

Third, I claim the hooks, B B, the braces, D D, and the strap or chain, F, in combination, when arranged and constructed as herein specified.

64,698.—CLOTHES PIN.—Wm. Patterson (assignor to Geo. T. Comins), Lowell, Mass.

I claim the arrangement of the split teeth, C C, in combination with the body, B, constructed and operating in the manner herein represented and described.

64,699.—BEDSTEAD FASTENING.—Martin Pechmann (assignor to himself and J. F. C. Peckhardt), New York City.

I claim the combination of a cylindrical nut, B, with a screw, A, substantially in the manner as and for the purpose specified.

64,700.—WAGON BRAKE.—John W. Phillippi, Stahlstown, Pa.

First, I claim the bolster, A, arranged and combined with the grooved friction roller, B, and axle, C, by means of bands, b' b' b b, substantially in the manner and for the purpose as herein set forth.

Second, The rods, F F, and rods, e e, as arranged for combining the brakes with the bolster and axle, substantially in the manner and for the purpose as herein set forth.

Third, The construction of an elongated slot, f, in the coupling pole, in combination with the bolster and friction roller, substantially in the manner described.

Fourth, The check or stop as arranged and combined with the coupling pole, substantially in the manner and for the purpose as herein set forth.

64,701.—BREECH-LOADING FIRE-ARM.—Thos. Poultney, Baltimore, Md., and Silas Crispin, New York City, assignors to Thomas Poultney.

We claim the horizontal reinforce lip or projection described, on the breech piece receptacle of breech-loading fire-arms of the class specified, said reinforce being formed and located substantially in the manner and for the purpose set forth, and having to serve in combination with it a guiding stud, z, or its equivalent in effect, also as explained, for the purpose explained.

64,702.—COMPOSITION FOR PENCILS.—S. C. Pruden, Athens, Ohio.

I claim an indelible pencil formed of the ingredients hereinabove named, mixed in or about the proportions substantially as described.

64,703.—APPARATUS FOR IMPREGNATING WOOD WITH TAR AND OTHER MATERIALS.—George Pustkuchen, Hoboken, N. J.

First, I claim an apparatus for impregnating wood, that is made and operated substantially as herein shown and described.

Second, The application of an air pump for the purpose of impregnating wood, when combined with the cylinder, C, and boiler, B, substantially as and for the purpose herein shown and described.

64,704.—DOOR HOLDER.—William Quayle, Warsaw, Ill.

I claim holding a door in any desired position by raising and lowering the rod, C, and its attachments, substantially as herein shown and described.

64,705.—CAN FOR HOLDING WHITE LEAD AND OTHER MATERIALS.—Alexander Randol, Allegheny City, Pa.

I claim the groove, D, in flange, C, of the lid, A, when used in combination with the bead, f, of the body, B, of the can or vessel, said flange, groove and bead being constructed, arranged and operating in the manner and for the purpose herein described.

64,706.—PLANING MACHINE.—Lemuel Read, North Brookfield, N. Y.

I claim in a rotary planing machine moving the cutters over the material operator on instead of the said material under the cutters, by means by the crank, F, pinion, I, and rack, L, pinion, K, and sliding frame, C' constructed and operating in combination, substantially as described.

64,707.—PLOW.—Jacob Reedy, Toledo, Iowa.

First, I claim the guard, C, adjustably attached to the beam or standard of a shovel plow, so as to operate substantially in the manner and for the purpose set forth.

Second, The pulverizer, F, adjustably attached to the standards or beam so as to operate in rear of the shovels of a plow, substantially in the manner and for the purpose set forth.

64,708.—POTATO DIGGER.—Elijah Rexford, Mentor, Ohio.

First, I claim the mode of supporting the fork as described so that it can be operated in the peculiar manner set forth, by means of the guide, C C, notched head, E, spring catches, G G', perforated rail, D, ratchet and pawls, J L, and handle, M, or by means equivalent thereto as and for the purposes stated.

Second, Supporting the guides, C C, and perforated rail, D, which carries the said fork, on the axle tree, A, and wheels, B B, whereby I am enabled to use said axletree as a fulcrum for raising the said fork with its contents as set forth.

64,709.—SMELTING FURNACE.—James A. Root, East Canaan, Conn., and J. M. Bartram, Sharon, Conn.

First, We claim the constructing of the hearth of a smelting furnace of cut stone having their inner surfaces rounded so as to form an interior of inverted conical shape with a solid or single stone, a, extending across the passage, c, substantially in the manner as and for the purpose set frrth.

Second, Having the lower parts of the blast pipes, B, formed of sections, c, arranged to slide one within the other, substantially as and for the purpose specified.

Third, The glasses, f, in the pipes, B, in combination with the openings, d, substantially as and for the purpose set forth.

64,710.—LOCKING APPARATUS FOR FERRY BOATS.—J. Rowland, Brooklyn, E. D. N. Y.

I claim the hooks, f f, arranged on the underside of the bridge, B, and weighted at their inner ends, substantially as and for the purpose herein shown and described.

Second, The bars, a, arranged at each end of the boot, below the deck and operated by the shaft, b, and chains, c, substantially as and for the purpose herein shown and described.

64,711.—CARRIAGE CLIP.—George B. Salmon, St. Paul, Minn.

I claim the combination of the thill iron, E, clip, B and rubber plate, G, and bolt, b3, the whole constructed and operating substantially as described and for the purposes set forth.

64,712.—STEAM GOVERNOR.—R. Sanderson, Cleveland, Ohio.

First, I claim the arrangement of the valve seat, E, and valves, G, when operating conjointly in the manner, substantially as described.

Second, The springs, J, as arranged in combination with the lever, I', rock shaft, H, and steam valve or valves for the purpose and in the manner as set forth.

Third, The screw, P, as arranged in combination with the lever, I' shaft, H, and valves, G, as and for the purpose substantially as set forth.

64,713.—TURN TABLE FOR BRIDGES.—Coleman Sellers (assignor to William Sellers & Co., Philadelphia), Pa.

I claim the combination of the central cylinder, M, radial bolts, K and L, and the cylindrical curb, H, or its equivalent, substantially as described for the purpose specified.

64,714.—MODE OF MAKING DRAINING TILE.—Benjamin A. Shaffer, Cass county, Ind.

I claim the lever or roller, as substantially described above for making and forming underground draining tile, the said lever or rolling working in a sliding mold or in any other manner, substantially the same.

64,715.—ATTACHING THILLS TO VEHICLES.—N. H. Shaw, Holderness, N. H.

First, I claim suspending the shaft to its coupling on carriage axle, between two bearings or ear pieces thereof susceptible of adjustment, substantially as described.

Second, A shaft coupling having that part of the same attached to the axle made in two parts or sections secured and hung together at one end and one upon the other with the shaft strap or bar suspended by a center bolt between ear pieces at their other ends, substantially as and for the purpose described.

Third, The conical shaped bearings between the shaft strap or bar and the part of the coupling secured to the axle, substantially as described.

64,716.—STEAM WHISTLE.—Thomas Shaw, Philadelphia, Pa.

I claim the combination of tubes, a and g, as set forth in combination with the apertures, f, for the purpose specified.

64,717.—SWEAT LEATHER FOR HATS.—David Shive, Philadelphia, Pa. Antedated May 9, 1867.

I claim the application to a hat of the supplementary sweat leather, B, constructed and operating substantially as and for the purpose described.

64,718.—BILLIARD REGISTER.—G. Simpson and R. M. Taylor, Waterbury, Vt.

I claim the arrangement of the two external dials with movable hands, A A' to indicate the points tallied by each flagen and the bell to give notice when the game is up in combination with the internal notched disk, D, spring finger and pawl, c, used a series of ratchet wheels, H I J, having numbers to register and indicate the games played, the same being operated in keeping the tally substantially in the manner herein described for the purpose specified.

64,719.—CHANDELIER.—Russell J. Skinner (assignor to Mancel Talcottt), Chicago, Ill.

First, I claim the combination and arrangement of the rod, L, tube, J, reservoir, A, tubes, B, and wick cups, C, operating substantially as and for the purposes specified.

Second, I claim the arrangement of the spring catch, b, or its equivalent, with the tube, J, and rod, L, when provided with one or more grooves, c, substantially as and for the purposes set forth.

Third, I claim the combination of the sleeve, G, arms, F, and globe rests, E, with the case, I, arranged and operating substantially as specified and shown.

Fourth, I claim the combination of the spool, N, movable section, O, and elastic band, R, substantially as and for the purposes specified.

Fifth, I claim the arrangement of the cap, a, with the reservoir, A, and tube I, or its equivalent, operating as and for the purposes specified and shown.

64,720.—SAFETY-VALVE DEVICE.—William H. Stanton, Dunmore, Pa.

First, I claim the combination of the piston, B, in the cylinder steam channel, C D, opening into the cylinder at a, above the piston, and at b c, below the piston, piston, J, spring, K, and set screw, m, substantially as described for the purpose specified.

I claim the plunger, J, the spring, K, the channels, C D, the apertures, a b c, and the set screw, m, arranged and operating substantially as described in combination with the cylinder and the piston, for the purposes set forth.

64,721.—CULTIVATOR.—G. W. Stockton, Oquaka, Ill.

I claim the swivel rods, G, in combination with the joint or pivoted clevises, c, the draft-evening device, K, and bent bars, L, arranged and operating substantially as described for the purpose specified.

64,722.—APPARATUS FOR WELDING CHAIN LINKS.—Edward Tangye, Brussels, Belgium. Antedated April 26, 1867.

I claim the improvements in tools for welding the links of welded iron chain and welded steel chain, hereinbefore described and illustrated in Figs. 1, 2, 3 and 4, of the accompanying drawings.

64,723.—COMBINED SEEDER AND CULTIVATOR.—Frederick W. Tilton, Bristol Station, Ill.

First, I claim the connected frames, B and C, carrying the teeth, I, and roller, D, in combination with the beam, N, and its connections for adjusting the depth to which the teeth may operate, all substantially as as and for the purpose herein set forth.

Second, I claim, in combination with the roller, D, and framing, B, the gearing, D' E, and universal joint, e, provided with the lever, J, and spring, K, for bringing the gearing into action with a yielding force and allowing it to be thrown out of and into gear, substantially as and for the purpose herein specified.

Third, I claim, in combination with the roller parts, D C, the cultivator parts, B I, and the drilling mechanism, G M A, with their several connections, adapted to operate conjointly substantially in the manner and for the purpose herein set forth.

64,724.—STEP FOR UPRIGHT SHAFTS.—Charles R. Tompkins, Rochester, N. Y.

I claim the inside sleeve, b, with its projections and the oil chamber, d d, in combination with steel screw, g, substantially as described.

64,725.—COOKING RANGE.—John Van, Cincinnati, Ohio.

I claim the arrangement of broiler or fire chamber, B, having both descending and ascending valve-guarded communications, O P, with the flues, K L M, of one or more elevated ovens, J J', at the discretion of the operator.

64,726.—BRICK MACHINE.—Thomas Walsh, John Walsh and David Evans, Brownsville, Pa.

First, We claim the slotted and grooved plunger, I, working in the chamber, J, provided with the partitions, o, in combination with the plungers, b, and the slide, N, provided with the molds, h, all arranged substantially in the manner as and for the purpose set forth.

Third, The slides, M, working through the hoppers, K K, and in openings, d, in the sides of the chamber, J, in combination with the rotary shafts, L, provided with the pins, c, substantially as and for the purpose specified.

Third, The combination and arrangement of the reciprocating slide, N, provided with the openings or molds, h, the plungers, I I, chamber, J, slides, M, and hoppers, K K, provided with the rotary shafts, L, having pins, c, attached, all arranged substantially as and for the purpose set forth.

64,727.—SEAT FRAME FOR CHAIRS.—G. A. Watkins, Proctorville, Vt.

I claim securing the legs to the seat of the chair by means of the metallic corner pieces, i, provided with the perforated extension plate, K, bent at right angles thereto and forming nuts to receive a bolt passing through the leg of the chair, substantially as herein shown and described.

64,728.—ADJUSTING SCREW FOR THE LEGS OF FANNING MILLS.—Herman Wolf, Avon, Pa.

I claim the construction and arrangement upon the legs of a fan mill or other machine of the bars, D, with their ends bent at right angles and perforated to receive the adjustable pointed screw, E, provided with the handle, F, as herein set forth for the purpose specified.

64,729.—HAY UNLOADER.—Julius Wood, Smyrna, N. Y.

I claim the combination of the hooks, ropes, and head piece, or their mechanical equivalent, as and for the purposes herein set forth.

64,730.—WATER INDICATOR FOR BOILERS.—Isaac F. Woodward, Philadelphia, Pa.

I claim a glass tube having a closed top and lower open end communicating with the steam space of a boiler in combination with an indicating rod arranged to slide in the tube and connected to or controlled by a float, all substantially as and for the purpose herein set forth.

64,731.—PAINT BRUSH.—John N. Woodward (assignor to himself and Thomas Arenser), Aurora, Ill.

I claim the band, A, with eyes, tongues and slots, as described, for attachment adjustably to the outside of paint brushes, substantially in the manner set forth.

64,732.—SHAVING BRUSH.—W. T. Wylie, New Castle, Pa.

I claim the arrangement of the case, C, piston, E, screw, I, nut, E, and cap, G, as and for the purpose described.

64,733.—CLAW FOR DRAWING NAILS.—J. S. Allen and O. Gillmor, Norwich, Conn.

We claim the combination of the pivoted fulcrum piece, C, with the gripping jaws formed upon the two levers, A B, substantially as herein set forth for the purpose specified.

64,734.—EYELETTING MACHINE.—N. Ames, Saugus Centre, Mass. and J. E. Gowen, Stoneham, Mass., assignors to A. B. Ely (by separate deeds), Newton, Mass.

First, We claim the combination of a vertically reciprocating puncher and header, each acting independently of the other, with a heading seat confined to and reciprocating in the same vertical plane, all arranged and operating so as to act at the same fixed points, substantially as described.

Second, Supplying the eyelets from a common hopper to the heading seat or holding point by means of the endless belt and groove, substantially as described.

Third, The combination of a horizontally reciprocating supporting table with a vertically reciprocating puncher, header, and heading seat, all arranged and operated in relation to the same fixed point, substantially as described.

Fourth, The work feeding device, constructed and arranged with an eyeletting machine substantially as described.

Fifth, The adjustable gage, in combination with the reciprocating table for regulating the setting lines of eyelets, substantially as described.

Sixth, Punching the holes by the vertically reciprocating movement of the puncher in connection with the punching table, furnishing the eyelets, and inserting and heading the same by the vertically reciprocating action of the heading seat, at the same fixed point, automatically, substantially as described.

Seventh, The reciprocating punching table and heading seat, so combined, arranged, and operated as to alternately occupy the same place for punching the holes and heading the eyelets at the same fixed point, substantially as herein described.

64,735.—PUMP.—Calvin Baker, Weymouth, Mass.

I claim the combination as well as the arrangement of the chamber, H, the pump barrel, A, the induction conduit, G, the valve, E, and the box, B, the whole being made to operate substantially as described.

64,736.—SHOE BRUSH.—C. L. W. Baker and L. S. Hills, Hartford, Ct., assignors to Lester S. Hills and George D. Jewett.

We claim the stopper, k, with the tube or tubes, h, brushes, e e', and receptacle, c, substantially as and for the purpose described.

64,737.—ROLLING MILL.—Royal M. Bassett (assignor to himself and Theo. S. Bassett), Derby, Ct.

I claim the employment, in combination with the box, of the lower roll of the adjusting wedge, L, inclined seat, K, screw shaft, P, and hand wheel, S, or its equivalent, the whole to operate as specified for the purpose set forth.

64,738.—MODE OF LIGHTING GAS.—W. W. Batchelder, New York City.

First, I claim the mode or process, herein described, of rendering a cord or tape combustible and inflammable by friction, substantially as set forth.

Second, The cord or tape coated with the ingredients, and in the manner herein specified.

Third, The application to and combination with a gas burner of otherwise ordinary or suitable construction, of a device composed of the following elements, viz:—

1st. A receptacle for the fuse or igniting cord.

2d. A tube through which the fuse is conveyed from the receptacle to within igniting distance of the gas issuing from the burner.

3d. A friction device to ignite the fuse at the end of the tube.

4th. A feeding mechanism to supply the fuse to be burned.

Fourth, The fuse receptacle made annular so that it may be mounted upon the burner, substantially as set forth.

Fifth, The combination with the receptacle and tube containing and conveying the fuse, as described, of a friction device operated by a rotary spindle, substantially in the manner and for the purposes set forth.

Sixth, The combination with a rotary spindle, carrying the friction devices of an endless screw and feed rack, under the arrangement described, so that by rotating the spindle the said rack shall be revolved and effect the feed of the fuse, substantially as herein shown and specified.

Seventh, In combination with the fuse receptacle and the feed and friction device, I claim the device herein shown and described, or the equivalent thereof, for checking the retraction or backward movement of the fuse.

64,739.—METHOD OF HANGING CENTER BOARDS OF VESSELS.—William W. Bates, Chicago, Ill.

I claim suspending the center boards of vessels by means of the frame, B, in combination with the plates, D, constructed and arranged substantially as described.

64,740.—WINDOW-BLIND FASTENER.—Charles P. Bell, Nashua, N. H.

I claim the stem B, provided with a thumb piece upon its side and a catch upon its lower end when used in combination with the socket or tube, A, provided with an opening or slot in its side to receive the thumb piece, and with a coiled spring, C, which surrounds the stem as and for the purpose herein specified.

64,741.—MELODEON.—Jonas Berger, Knoxville, Tenn.

I claim, in the construction of an upright melodeon, arranging four swells and springs with the double reed boxes and bellows, and combining therewith the double series of levers, as arranged for operating the swells, substantially in the manner and for the purpose as herein set forth.

64,742.—BUTTONS.—A. W. Browne, Brooklyn, N. Y.

I claim the fastening device consisting of the retainer, B, the ends of its stem or shank being provided with hooks, S, projecting inwardly or toward each other, in combination with the plate or button head, A, which is provided with the bridge or eye, I, substantially as described.

64,743.—CORNSTALK CUTTER.—Samuel Bryan, Jefferson, Wis.

First, I claim the frame consisting of the bars, A and U, mounted on the wheels, B, with the curved axle, O, and knives, K, arranged as shown and described.

Second, The swinging frame, G, arranged to receive and hold the cut stalks, as set forth.

Third, In combination with the swinging frame, G, I claim the windlass, Y, with its cord, a, arranged substantially as set forth, for compressing the bundles for binding.

64,744.—HARVESTER.—Charles W. Cardot, Fredonia, N. Y.

I claim in a two wheeled machine, a compound gear frame and shoe composed of the parts c c1 c2 and c3 c4 c5 and hinged to the axle of the driving wheels the whole being constructed, arranged and operated in the manner substantially as set forth.

64,745.—ATTACHING THE DRAFT POLE TO MOWING MACHINES.—Charles W. Cardot, Fredonia, N. Y.

I claim in a two wheeled machine having a gear frame shoe constructed as herein described and journalled to the axle of the driving wheels, the attachment of the draft pole to such frame at a point or points between the axle and shoe for the purpose and substantially as described.

64,746.—DRAFT POLE FOR MOWING MACHINES.—Charles W. Cardot, Fredonia, N. Y.

I claim a draft pole having a removable push back iron or sleeve C, in combination with the sliding rod B, pulley D, and chain b', constructed, arranged and operating substantially as herein described.

64,747.—PLOW.—Andrew Carson, Memphis, Tenn.

First, The herein described construction of the shovel A, with the steel laid on the front side and its turned up edges B, in combination with its center C.

Second, The diagonal band D, constructed as described and shown.

Third, The center C, with its notches.

Fourth, I claim the braces E and F, in their relation to the beam H, and standard I, all arranged as and for the purposes specified.

64,748.—FIELD ROLLER.—C. B. Colcord, Greenville, Ill.

First, I claim the combination and arrangement of the frame A, with the oscillating frames B' B', substantially as described and set forth.

Second, I claim the adjustable device C, c, C2, for the purpose of changing the ballast box forward or backward, substantially as described.

64,749.—FRUIT GATHERER.—J. C. Counts, Cross Roads, Ohio.

I claim an apparatus for gathering fruit constructed with the parts A B C D and E, respectively, constructed and arranged substantially as set forth.

64,750.—BALANCE VALVES FOR STEAM ENGINES.—Jacob G. Crockett, Portsmouth, N. H., assignor to himself, John J. Flanders and John W. Hayes.

First, I claim the arrangement of two valves on the same shaft, so that the shaft shall hold the valves against the pressure of the steam, and relieve the valve seats from the pressure of the valves, substantially, as herein set forth.

Second, I claim the devices described for traversing one of the valves on the shaft to adjust both to their seats, substantially as described.

64,751.—METHOD OF REPAIRING RAILROAD RAILS.—John B. Deck, Martinsburg, West Virginia.

I claim the anvil A, with its recesses and grooves combined with the dies B B', lifters C C', and levers D D', arranged and operating substantially as and for the purpose set forth, and this I claim whether the anvil be furnished with one or more pairs of dies with lifters and levers as described.

64,752.—MEASURE AND FUNNEL COMBINED.—Henry L. Dickenson, East Berlin, Conn.

I claim the combination of the measure A, and nozzle C, with the valve G, sleeve C', and spring E, substantially as and for the purpose described.

64,753.—ENVELOPE.—Henry Everdell, New York City.

I claim the envelope constructed substantially as described with a flap and tongue, the latter fitting through an incision in a closed wing or portion of the back, and the tongue or flap and wing into which it fits being embossed and provided with a bow or knot to give a secured aspect to the envelope while it is left free to open yet protected against flaring open substantially as specified.

64,754.—MACHINE FOR MAKING WAGON CLIPS.—George Feightner, Wooster, Ohio.

I claim the stationary die G, and movable dies C F, in combination with the die box B, constructed as and for the purpose set forth.

64,755.—COMBINED HOE AND HAND PLANTER.—Henry Feesler and Isaac E. Betz, Canton, Ohio.

We claim the cylinder E, as constructed and used in combination with the plug C, with its set screw and seed recess, and handle D and A, as and for the purpose specified.

64,756.—STEAM HEATING AND VENTILATING APPARATUS.—Ferdinand Fisher, Cambridge, Mass.

I claim the apparatus above described, for utilizing exhaust steam for the purpose of heating, and for ventilating apartments or buildings, consisting of the tubular drum A, with its induction and eduction pipes d e, and the blower or blast apparatus B, combined and operating as set forth and explained.

64,757.—KNUCKLE JOINT.—George B. Garlinghouse, North Madison, Ind.

I claim a knuckle joint provided with cylindrical terminations adapted to roll upon each other, and held in place by racks and links, or their equivalents, substantially as set forth.

64,758.—CHURN.—David Gates, Captina, P. O., Ohio.

I claim the combination of the radial dashers G, with centre tube M, be

tween the posts P P P, and cross braces J and L, when constructed, arranged and operated as herein described and for the purposes set forth.

64,759.—FEED RACK.—E. Gratten, Williamstown, Mich.

First, The combination of troughs O and H, constructed and operating in the manner and for the purpose herein set forth.

Second, The receptacle F, constructed as and for the purpose described.

Third, The troughs O and H, in combination with the adjustable sides C, and rack bars n, and the perforated bottom F, the whole constructed, arranged and operating as and for the purpose herein specified.

64,760.—Suspended.

64,761.—EYELETTING MACHINE.—Luther Hall (assignor to Alfred B. Ely), Boston, Mass.

I claim, First, The latterally-sliding head or carrier, in combination with the punch and set, constructed, arranged, and operating in the manner and for the purpose substantially as described.

Second, The head or carrier so constructed and operated as to allow the punch and set to be alternately depressed by the same lever, substantially as described.

Third, So constructing the mechanism that the punching table and setting bed shall reciprocate laterally, alternately occupy the same place, the holes be punched, and the eyelets set at the same time, in the manner substantially as described.

Fourth, Feeding the material forward after the eyelet is set and away from the setting point, by means of the solid pointed setting bed, under an arrangement and combination of parts, substantially as described.

Fifth, The constantly-pressing spring-presser foot, in combination with the feeding mechanism as described, stripping the material as it is eyeleted from the constant grasp of the table and the foot, under an arrangement of parts as set forth.

Sixth, The hopper for holding the eyelets, in combination with agitating devices as described, and the adjustable chute provided with the enlarged receptacle or disk at its lower end, constructed and arranged as and for the purpose set forth.

Seventh, The setting die, so constructed and operating as to pick up the eyelets from the enlarged receptacle in the chute by adhesion, and present them to the place of insertion, substantially as described.

Eighth, The combination of the levers, V and F, and pin, S, operating in the manner and for the purposes set forth.

Ninth, The striking lever, so constructed and arranged as to cause the set to be forced into the eye of the chute and pick up the eyelet while the punch is making the hole for its reception, substantially as described.

Tenth, The combination of plates, Q and R, arranged and operated as described.

Eleventh, Punching the holes, supplying, inserting, and setting the eylets, adjustably spacing the distances, and feeding forward the work by means of devices, so combined as to effect these objects automatically, when constructed, arranged, and operated in the manner described.

64,762.—ANCHOR STOCK.—John Luke Hanly, San Francisco, Cal.

I claim an anchor stock, C, in combination with the permanent flange, C, and removable key, D, substantially as and for the purpose herein set forth.

64,763.—MANUFACTURE OF THE CARBONATE OF LEAD.—Henry Hannen (assignor to S. A. Hannen and S. W. Greene), Philadelphia, Pa.

I claim, First, The manufacture of carbonate of lead by the action upon metallic lead or oxide of lead of water, acetic acid, and carbonic acid gas, when the said fluids are brought in contact with the lead, substantially as described.

Second, Subjecting the lead to the action of carbonic acid gas under a pressure, substantially as and for the purpose set forth.

Third, Subjecting the lead, during the process of its conversion into a carbonate, to the action of chlorine, for the purpose specified.

64,764.—RAILROAD SWITCH.—Andrew Hartman, Canton, Ohio. Antedated May 5, 1867.

I claim in an automatic switch the arrangement of the plate, b, with tumbler, g, weight, m, trigger, n, and spring, s, operated by the shoe, q, and eccentric, C, connected to the railroad car and rail respectively, when used in combination with the plate, E, levers, D D', connected by the rods, d, and operating in the manner substantially in the manner substantially as specified.

64,765.—HINGED GUN-REST.—Joseph Hawkins, West Windsor, N. J.

I claim the slide, F, and jointed rod, G, in combination with the plate, D, beneath the barrel, B, of a fire-arm, the whole being constructed and arranged as described.

64,766.—SUSPENSORY BANDAGE.—Edward Heaton (assignor to C. B. Whittlesey), New Haven, Conn.

I claim the combination of the pouch, A, having the opening, C, protected in the manner described, with the body piece curved, formed, and attached thereto, as shown and described, and the straps, D and E, also curved, formed and attached to the said body piece, as set forth, the whole constructed and arranged in the manner herein specified.

64,767.—MODE OF SECURING WOOD TO METAL.—Robert Howdon (assignor to Crane, Breed & Co.), Cincinnati, Ohio.

I claim securing wooden or like objects to metallic surfaces, etc., by casting Babbitt or other metal of easy fusion into flaring or branching holes, C D, and otherwise, as herein shown and described.

64,768.—LAMP.—John S. Hull, Cincinnati, Ohio.

I claim the cap, B, as applied to the condensing pump, A, and in combination therewith, for the purpose herein specified.

I also claim the extension of the valve rod through the lamp reservoir, and the arrangement of the valve-adjusting device connected therewith in the base of the lamp, as herein set forth.

64,769.—GENERATOR FOR VAPOR LAMPS.—John S. Hull, Cincinnati, Ohio.

First, I claim the chamber, B, of a gas generator, when constructed with lips, I I', projecting above the point of ignition, and in immediate contact with the flame, the oil being conducted through them in tubes, C and C', substantially as set forth.

Second, in combination with the opening, M, through the chamber, B, connecting with the internal chambers, G, I claim the adjustable collar, K, for regulating the supply of atmospheric air, substantially as and for the purpose set forth.

Third, I claim the chamber, B, when constructed with pipes, C C', lips, I I', and openings, B2 and M, arranged substantially as and for the purpose set forth.

Fourth, I claim the receiving chamber, D, formed in the boss, L, with its induction and eduction openings, when the flow of gas through the same is regulated by a valve, E, substantially as set forth.

64,770.—MOTIVE POWER.—Andrew Johnson and W. H. Elliot, Bloomington, Ind.

I claim the motive power, which is constructed and operated substantially as herein described.

64,771.—HAND PLOW.—F. Keefer, Greenfield, Ind.

I claim, First, The arrangement of the beams, A, the wheel, B, roller, G, and shank, H, provided with the brace, J, and point, I, as and for the purpose set forth.

Second, The hinged brace, E, in combination with the standard, C, and beams, A, as and for the purpose specified.

64,772.—DEVICE FOR CLEANING STABLES.—Solomon Kepner, Pottstown, Pa.

I claim the fork, A, and hooks, B B, and combination of fork and hooks, for the purpose herein set forth.

64,773.—BEEHIVE.—K. P. Kidder, Burlington, Vt.

I claim, First, The arrangement of the frames having bars constructed as described, with the support slotted as described, and with the bottom strips, e e, substantially as herein set forth.

Second, The box or trap, G, in combination with the tube or passage, H, and body, A, whereby the drones are allowed to pass out, but not to return to the hive, and are caught and separated from the worker bee, so that they may be destroyed, substantially as set forth.

64,774.—LIGHTNING CONDUCTOR.—J. A. Kissell and N. Blickensdufer, Chicago, Ill.

We claim a lightning conductor, consisting of a strip of copper, having the ribs, a, formed solid therewith, as herein shown and described.

64,775.—STEAM-ENGINE GOVERNOR.—J. P. Theodore Lang, Washington, D. C.

I claim, First, The combination and arrangement of the curved slotted guides, H H, collar, h, arms, d, friction rollers, d', springs, f f, weights, E E, collar, F, friction rollers, g g, loose collar, a, rods, l, collar, k, constructed, arranged, and operating in the manner substantially as shown and described and for the purpose set forth.

Second, The combination of the valve, M, and cover, L, with the governor, substantially as set forth.

64,776.—APPARATUS FOR CARBURETING GAS.—W. H. Lauback, Philadelphia, Pa.

First, I claim the carbureting vessel, B, in combination of the regulator, A, substantially as described.

Second, I claim the combination of regulator, A, and hydrocarbon vessel, B, substantially as described.

64,777.—APPARATUS FOR MAKING PEAT CHARCOAL.—James B. Lyons, Litchfield, Conn.

First, I claim a revolving cylinder, constructed and arranged as herein described, for making charcoal or coke directly from the crude or bog peat, substantially as herein set forth.

Second, I claim constructing a furnace with cast-iron ends and a fire box, in and over which is a revolving cylinder made of boiler iron, fitted and supported on friction rollers, to enable it to be easily turned to change the position of the material.

Third, I claim the pipe, h, as arranged for conducting the gas from the cylinder, A, into the fire box, C, to supply feed for operating substantially as and for the purposes specified.

Fourth, I claim the flanged heads, a a, with semicircular openings, b, and sliding covers, c, in combination with revolving cylinder, B, friction rollers, e e, and fire box, C, as constructed for converting crude peat into charcoal and coke, substantially as described.

Fifth, I claim the gas pipe, h'', the bulk or vessel, m, stop cock, n, in combination with the furnace, C, and cylinder, A, all arranged and operating substantially in the manner as and for the purposes herein set forth.

Sixth, I claim the mode of constructing the double arches supporting the brick on ribbed curved bars so as to leave a longitudinal flue the whole length of the furnace, for saving the heat from the flame generated from the gas in the cylinder, as set forth.

64,778.—BRICK MACHINE.—John Marshall, Fond du Lac, Wis.

First, I claim in combination with the mold the wedge-shaped cover working in corresponding wedge-shaped grooves, in order to bind the cover home to the mold during the pressing, then to facilitate the removal of the cover, substantially as set forth.

Second, In combination with the lever, b, and the follower, I claim the swinging fulcrum, L, for preventing the side strain and consequent binding of the follower, substantially as described.

Third, The follower, D, working in the mold, in combination with the sliding cover, S, and operated by the knuckle-joint lever, F G, operated substantially as shown and described.

Fourth, The lever, R, provided with the hook, F, for releasing the cover, S, substantially as set forth.

64,779.—MACHINE FOR MAKING DOOR AND WINDOW FRAMES.—W. W. Maughlin, Baltimore, Md.

First, I claim the saw table, B, provided with the adjustable gage as described, in combination with the circular saw, b, and one or more grooving cutters, constructed, arranged, and operating substantially as and for the purpose set forth.

Second, The miter stand or table provided with the adjustable gage, F, in combination with the vertically adjustable miter saw, b', arranged and operating as set forth.

64,780.—BOOTS AND SHOES.—Edward Mayer, Philadelphia, Pa.

I claim extending the side and front edges of the insole of a boot or shoe upward around the inner side of the upper, substantially as and for the purpose described.

I also claim the application of the band, F, over the joint formed between and by the upper and the outside sole of a boot or shoe, substantially as and for the purpose described.

64,781.—LOW WATER INDICATOR.—Geo. McAllister (assignor to himself and Chas. B. White), San Francisco, Cal.

I claim a water gage composed of the float, f, arm, d, parts or case, A B and C, and passages, D D, constructed substantially as and for the purpose described.

64,782.—MAKING BUCKLES.—G. B. McDonald, New Albany, Ind., assignor to J. Bragdon & Co.

I claim making buckles by first rolling the metal bar to the shape represented in fig. 2, and afterward dividing and punching the same, all as described.

64,783.—METAL BEAM.—Joshua Merrill, Boston, Mass.

I claim the hollow metal beam made water tight and suitable to contain a body of water within it and provided with suitable apertures for the introduction of water, substantially as hereinbefore described and substantially for the purpose hereinbefore set forth.

Also in combination with said hollow metal beam constructed with suitable apertures for the introduction of water and the escape of steam, a body of water contained within said beam, substantially as described for the purposes set forth.

64,784.—PEAT GATHERING MACHINE.—Abraham Michelbacher, New York City.

First, I claim the combination of the scraper, F, the rotating buckets, E, and the receptacle, C, with a suitable carriage, substantially as and for the purpose specified.

Second, The scraper, F, pivoted in rear of the rotating buckets, E, and furnished with handles, n, whereby the said scraper may be made to operate at a greater or less depth, substantially as herein set forth.

Third, The receptacle, C, suspended on pivots in front of the rotating buckets, E, and constructed with an end board, F, hinged at its upper edge, substantially as and for the purpose specified.

64,785.—HOISTING MACHINE.—Wm. Miller, Cincinnati, Ohio.

First, I claim the combination of rod, H, levers, P P, and pawls, N N, jointed substantially as described, with the racks, O O, and a spring, L, substantially as and for the purpose set forth.

Second, The catches, S S, and spring, X X, or their equivalents, for the purpose of affording an automatic stop for the platform (to which they are not attached when the safety apparatus fails to act), as described.

64,786.—BREECH-LOADING FIRE-ARM.—W. H. & G. W. Miller, West Meriden, Conn.

First, I claim the construction of the breech piece with the central elongated slot, combined with the cross head and mortise in the case, for the purposes and operating in the manner described.

Second, The combination of the breech piece cylinder pinion, D, and cylinder, E, toothed and geared together and operating in the manner and for the purposes described, by means of the lever or arm, F.

Third, The combination of the elongated slot with the mortise or recess in the shell of the case, whereby the exact amount of upward and downward movement of the breech piece is regulated by the length of the slot, so that the cross head is brought home in the mortise or lifted out at the instant required.

64,787.—MEDICAL COMPOUND.—C. H. Mitchell, Bristow Station, Ky.

I claim the compound made of the aforesaid remedies for curing disease as specified.

64,788.—CARPET STRETCHER.—Geo. Mosman, Chicopee, Mass.

I claim the spring-holding jaws, d d, formed in one piece of metal, in combination with the plate, k, substantially as and for the purpose described.

64,789.—CORN HARVESTER.—Josiah Oadhoudt, St. Anthony's Falls, Minn.

I claim the frame, A, with its oblique guides, G G, reel, F*, constructed as set forth, cutters, E E, attached to the bars, D D, each side of the thills, C C, and the pivoted arms, g g g, for dropping the corn, when constructed, arranged and operating in the manner substantially as and for the purpose herein specified.

64,790.—BENCH PLANE.—Nelson Palmer (assignor to himself Sidney W. Palmer, and J. Foreman Palmer), Auburn, N. Y.

First, I claim the combination with the movable section or plate for adjusting the size of the throat of a recessed bed and frame formed in the plane stock in front of the bit and parallel to the face of the plane so as to enclose the said section on three sides and form the ways in which it slides for purposes of adjustment, substantially as shown and set forth.

Second, The bed for supporting the heel of the bit formed of lead or other suitable plastic material as specified, run between the said heel and the back of the throat so as to form an accurately fitting and solid bed for bit close to its cutting edge, substantially as herein set forth.

Third, The method of and means herein described for adjusting the bit longitudinally so that it shall project more or less from the face of the plane that is to say connecting the bit with an eccentric mounted in the bed of the bit the eccentric being operated substantially as herein shown and set forth.

Fourth, I claim the mechanism for maintaining the parallelism of the edge of the bit with the face of the plane, the same consisting of the combination with the bit and bed in which it is supported of a bar capable of sliding laterally in the bed as described, and connected with the bit under such an arrangement that it shall cause the edge of the bit to be tilted or inclined toward one side or the other, substantially as set forth.

Fifth, The combination of the transverse sliding bar provided with jaws and projecting arm or spur as described, with a cam or spiral grooved shaft and actuating lever or equivalent means, substantially as herein shown and set forth.

Sixth, The combination with the tilting or movable bed and bit which it supports of the toggle jointed and reversible lever and holding pins in the side of the stock, substantially as herein shown and described.

Seventh, The combination with the movable bed and toggle jointed lever of an adjustable bearing for the said lever, substantially as set forth and described.

Eighth, I claim the adjustable cap herein described, the same consisting of an upper and a lower plate or section connected by an eccentric rod or disk whereby the lower section may be adjusted in its proper relation to the cutting edge of the bit, substantially as shown and described.

Ninth, I claim the combination with the movable section for adjusting the size of the throat, of the knob for securing the same, under the arrangement herein described, so that the said knob shall not only serve to adjust and hold the said section in place but shall also be a handle for giving the movement of the plane, substantially as set forth.

64,791.—HORSE POWER.—D. J. Powers and H. B. Stevens, Madison, Wis., assignors by mesne assignments to Buffalo Agricultural Machine Works.

We claim the drivers platform, D, when resting on a central fixed pivot, C, substantially as and for the purpose herein specified.

We also claim the transferring shaft and wheel G and H, turning around the central pivot, C, for the purpose specified.

We also claim the flanges, m and p p, respectively on the master wheel, B, and pinions, f g, substantially as and for the purpose herein set forth.

We also claim the combination and arrangement of the master wheel, B, fixed pivot, C, drivers platform, D, and transferring shaft and wheel, G, and H, as herein described.

64,792.—HOE.—Arthur Prentiss, Prentiss Vale, Pa.

I claim as a new article of manufacture, a hoe for garden or other use, cut, formed and otherwise constructed as described and shown.

64,793.—INHALER.—Arthur Prentiss, Prentiss Vale, Pa.

I claim an inhaler when formed and its various parts arranged substantially as described and for the purposes set forth.

64,794.—CARRIAGE WHEEL.—Arthur Prentiss, Prentiss Vale, Pa.

I claim the wheel rim or felloe when swaged or otherwise formed into suitable shape of sheet metal either in one or many pieces in combination with the grooved tire, B, either when this grooved tire, B, is made the principle tire or used in connection with the supplemented one as shown in fig. 1.

64,795.—CARRIAGE WHEEL.—Arthur Prentiss, Otto, Pa.

First, I claim the combination and use of the socket, A, when provided with the small socket, E, and the flange, B, all in one piece with the pin or screw, i, and the felly and spoke of a wheel, substantially as described and for the purposes set forth.

I claim the spoke socket and joint clasp composed of the socket, A, flange, B, extended sides, C C, and connecting plate, D, all of one piece of malleable iron or its equivalent for the purpose shown.

64,796.—CAR WHEEL.—John Raddin, Lynn, Mass.

I claim arranging the elastic rubber ring or cushion so as to operate within a space as described formed between the hub and the web or its equivalent and side flanges of a wheel.

64,797.—HARVESTER.—Adam R. Reese, Phillipsburg, N. J.

First, I claim the fingers, b, pivoted to the bar, b, operating in combination with the clearer, S, substantially as and for the purpose specified.

Second, The shaft, K, provided with fingers, d, and arranged to operate in connection with the grain platform, substantially as and for the purpose specified.

Third, The grain supporting bar, T, provided with the oblique teeth, i, and raised and lowered automatically from the grain platform, substantially as and for the purpose set forth.

Fourth, I claim in combination with a harvesting machine, an automatic gavel regulator so constructed that it can be set so as to make the gavels at such different regular distances apart as desired, substantially as set forth

64,798.—BARLEY FORK.—Martin C. Remington, Auburn N. Y.

I claim the metallic head, A, as constructed with its arch, D, and raised socket, E, to receive a straight handle in combination with a bail or bow, B, and brace, G, operating in the manner as and for the purposes herein set forth.

64,799.—SOFA BEDSTEAD.—Stephen C. Roscoe, Obion county Tenn.

I claim the revolving lower cushion or seat of the sofa secured in its position as described in combination with the movable position of the frame passing out of the way and beneath the cushions or seats as herein substantially described.

64,800.—SPINDLE FOR SPINNING MACHINES.—Joseph Marie Ryo Catleau, Paris, France.

First, I claim the method of effecting the automatic retardment of the rotation of the spindle which carries the bobbin, substantially as shown and set forth.

Second, The combination with the spindle which carries the bobbin of the reciprocating tube, and helicoidal inclined planes under such an arrangement that the reciprocating movement of the said tube shall effect the automatic retarding of the rotation of the bobbins, substantially as herein shown and described.

64,801.—WAGON BRAKE.—John W. F. Schultz, Molino, Ill.

I claim the arrangement and combination of the levers, D C P, bar, G, rod, T, lever, H, when the whole is operated in connection with pulleys, I J, and chain, H, substantially as set forth.

64,802.—GATE.—George W. Sizer, Springvale, Wis.

I claim attaching the rear ends of the gate bars, B B B and B' directly to the part, A, with no other frame work and connecting them at the front ends by cross bar, b, and in combination with slotted part, A', the whole constructed substantially as described and operating as and for the purpose set forth

64,803.—BUTTER WORKER.—William E. Skinner, Milford, Mich.

I claim giving the paddle of the butter worker a compound motion in imitation of the motion given to the paddle by a dairy woman, substantially as set forth by the devices described or their equivalents.

And in combination with the paddle having the compound motion above claimed, I claim giving the butter bowl a rotary motion, substantially as described.

In combinaton with the butter worker, I claim the press box with movable sides hinged to its base, substantially as described.

And in combination with the press box above claimed, I claim the traversing follower, substantially as described.

64,804.—LAMP BURNER.—George Smith, Providence, R. I.

First, I claim the application of a spring to the slide or valve, a, which is used for closing the opening through a lamp burner, substantially as described.

Second, The relative arrangement of the laterally movable spring slide, a, with respect to the wick spur button, D, substantially as described.

64,805.—COMPOUND FOR WELDING STEEL.—C. Sparks, Donners Grove, Ill.

I claim the above described compound for welding steel.

64,806.—BEEHIVE.—Solomon Stevens, New Carlisle, Ind.

First, I claim the grooved strips, d d, in combination with the comb frames, e e, substantially as arranged for the purpose and in the manner specified.

I also claim the box, I and rube, g, combined arranged and operating in the manner and for the purpose set forth.

64,807.—MAKING GLASS LETTERS, NUMBERS, ETC.—Otto Stietz, New York City.

I claim a letter formed upon the reverse side of a piece of glass by means of etching in the face of the letter and covering it with a surface of metal or foiling, lapping upon the unetched portion, thereby producing an appearance of relief, substantially as described.

64,808.—DOOR FASTENER.—Horatio N. Taft, Sag Harbor, N. Y.

I claim a combination portable door fastener, constructed, combined and operating substantially as herein shown and described.

64,809.—BUSH FOR SPINDLES FOR GRINDING MILLS.—John H. Teahl, Eberlys Mills, Pa.

I claim the above-described mill bush consisting of the funnel-shaped metal box, D, having conical friction rollers revolving therein and carrying the spindle within the frame that holds the rollers, when constructed and operating substantially as described.

64,810.—GARBAGE BOX.—D. D. Templeton, New York City.

First, I claim the lid, A, constructed substantially as described.

Second, The angular groove, E, in combination with the box, W, and lid, A, substantially as described.

Third, The trap door, L, in combination with the box, k, communicating with the cellar and supporting the receptacles, B, substantially as represented ann described.

Fourth, The combination of the garbage and ash box, substantially as described.

64,811.—WEATHER STRIP.—E. S. Torrey, New York City.

I claim the combination of the strip of soft india-rubber, or its equivalent, with a strip or molding of hard rubber, or its equivalent, substantially as and for the purposes herein set forth.

64,812.—BRICK-MOLDING MACHINE.—Timothy Tufts, Somerville, Mass.

I claim the combination of one or more tubular conveyors, C, with the expressing chamber, B, its plunger, E, and mold, D, to operate substantially as specified.

I also claim the combination and arrangement of the covering plate, K, with the carriage, H, one or more tubular conveyors, C, the expressing chamber and its plunger, the whole being provided with mechanism for operating them substantially as specified.

I also claim the combination of the mold-lifting and depressing mechanisms with one or more tubular conveyors, C, the expressing chamber and its plunger, to operate with the mold, as specified.

I also claim the combination of the mold operative carriage, H, with one or more tubular conveyors, C, the expressing chamber, B, and its plunger applied to the mixing reservoir and provided with mechanism for operating them, substantially as specified.

I also claim the combination of the scraper, S, with one or more conveyors, C, the expressing chamber, B, and its plunger, E, to operate with the mold, substantially as set forth.

64,813.—TRUNK LOCK.—Leonhardt Uitting (assignor to C Liebrich), Philadelphia, Pa.

I claim the spring bolt, E, and tumbler, I, or its equivalent, constructed and operating substantially as described, so that a self fastening device and an ordinary locking bolt operated by a key may be combined in one lock.

64,814.—COTTON AND HAY PRESS.—C. Ph. Wagner, New York City.

First, I claim the combination of the vertical screw, C, with the segments, D D, provided with radial arms, E, pivoted by double toggle joints, F F', to opposite sides or ends of the platen operating so as to give to it a variable velocity and action, substantially as specified.

Second, The side braces, M, fitting into shoes, o, at their base and gearing with open hook ends of a cross bar, L, to the lower, the baling box at top, essentially as shown and described.

64,815.—SHIELD FOR PROTECTING WATER BACKS IN RANGES AND STOVES.—M. J. Wellman, New York City.

I claim the metallic plate between the water back and the fire and forming the back of the fireplace and protecting the water back at all times so constructed and arranged as to rest against the water back when the water back is to be heated and to be moved forward and permit a current of air to pass up between the said water back and the fire when the heat of the fire is to be excluded therefrom, as and for the purposes herein set forth.

64,816.—VENTILATING SKY LIGHT.—Norman W. Wheeler, Brooklyn, N. Y.

I claim, First, The combination of the hood, a, frame, B B, and glasses, E E E, or their equivalents, as set forth.

Second, The combination of the hood, a, pan pipes, I I J, and frame, B B, or their equivalents, substantially as set forth.

Third, The combination of the trunk, r, and glasses, S S S S, with the above, substantially as set forth.

Fourth, The combination of the pipes over and lighted frame, B B, or their equivalents, substantially as set forth.

64,817.—MACHINE FOR GRINDING THE CUTTERS OF HARVESTERS.—Henry Whitall, Woodbury, N. J.

First, I claim a portable machine adapted to grind the cutters of mowing and reaping machines, when arranged and operating in the manner substantially as described.

Second, In combination with a machine constructed substantially as described, I claim the clamp, P, when arranged for joint action with the said machine, as and for the purpose described.

64,818.—HARVESTER.—Wm. N. Whiteley, Jr., Springfield, Ohio.

First, I claim the coupling arm, J, in combination with the circular plate, H, substantially as and for the purpose set forth.

Second, The coupling arm, J, constructed to clasp the sector plate, H, at three points so as not to depend upon the pinion shaft for its center of motion.

Third, The coupling arm, M, mounted and moving upon the horizontal

axle stud, K, through which passes the cutters crank shaft, substantially as and for the purpose set forth.

Fourth, The hook, U, in combination with the flange, V, on the hub of M, substantially as and for the purpose set forth.

64,819.—HARVESTER RAKE.—Wm. N. Whiteley, Jr., Springfield, Ohio.

First, I claim, in combination with a harvesting machine having two adjustable wheels, a hinged cutting apparatus and a raking and reeling mechanism mounted on the inner end of said cutting apparatus rotating about a vertical shaft, F, and counter shaft D, with their bevel gear connections for the purpose of driving the said reel and rake by a train of gearing from the main pinion shaft and so that the movements of the reel and rake may at all times conform to the position of the finger bar, substantially as set forth.

Second, In combination with a harvesting machine having two wheels and a hinged cutting apparatus, the tubular drag bar, I, rigidly secured to the frame of the machine and forming the center upon which the cutting apparatus vibrates so that the axis of the reel and rake's driving shaft may be coincident with the axis upon which the cutting apparatus vibrates, substantially as set forth.

Third, The collar, T, provided with the notch, Q', in combination with the stop plate, E', and clutch lever, A', substantially as and for the purpose set forth.

Fourth, The clutch lever, A', in combination with connecting rod, B', and head lever, C, constructed and arranged as set forth.

64,820.—VEHICLE.—John G. Wilkinson, Quincy, Ohio.

First, I claim the arrangement of the rocker shaft, F, with its divided lever, H, rods, G G, and crank axle, B, with the frame, D, in the manner substantially as and for the purposes herein specified.

Second, The rocker shaft, F, when constructed in the manner as herein set forth.

64,821.—LOCOMOTIVE TRUCK AND ENGINE.—Joseph P. Woodbury, Boston, Mass.

First, I claim a locomotive engine constructed with horizontal boiler resting entirely on trucks, which have free lateral oscillation independently of the boiler, these trucks being provided with vertical frames, as shown and described for the purpose set forth.

Second, The vertically-acting cylinders, in combination with a frame which oscillates rotatively with the truck independently of the boiler.

Third, The combination and arrangement of the pipes, J, the pipe, F, exhaust pipe, Y, cap, I', and pipes, H.

Fourth, The combination of the circular series of radial rollers, a, with the concentric rings as shown in Fig. 5, holding the axes of the same and the horizontal boiler and the truck.

Fifth, The combination of the operating rod, z, toggle joint, U, and reverse handle, N, as shown in Figs. 1 and 2.

Sixth, The combination and arrangement of the arms, f f, the journal boxes, g g, of the driving wheels, and journal box, S, as shown in Fig. 8.

Seventh, The rod, z', with swivel connections, in combination with the throttle 7 of the forward engine.

Eighth, The swivel plate or yoke, p p, in combination with the engine frame and steam dome.

Ninth, The combination as well as the arrangement of the pipe, F, and its adjunct with the steam dome, D, as shown in Fig. 9.

64,822.—BABY CARRIAGE.—S. Sayre Woodruff, Brooklyn, N. Y.

First, I claim the combination of the pivoted reservoir, tongue, or shafts with the body of the carriage, substantially as herein set forth for the purpose specified.

Second, The combination of the pivoted reversible tongue or shafts, constructed with elastic sides as set forth, with the ears or stops, d and e, formed upon the body of the carriage, substantially as and for the purpose specified.

64,823.—TOBACCO BELTING KNIFE.—Joseph B. Worsham, Hibernia, Mo.

I claim the the belting knife or implement constructed and used substantially as herein shown and described.

64,824.—APPARATUS FOR MASHING AND COOLING IN BREWERIES.—George S. Yingling and Samuel F. Poorman, Tiffin, Ohio.

First, I claim the use of the adjustable bars, D D, provided at their lower ends with the shovels, G G, which are used in connection with the shovels, G G, as and for the purpose set forth.

Second, The arrangement of the shaft, A, with its bars, B E and D, its rounds, C C, and the shovels, G and F, the several parts being constructed and used as and for the purpose herein specified.

64,825.—MEASURING FUNNELS.—John H. Elward, Mendota, Ill.

I claim the combination of the valve, B, rod, C, lever, E, and slotted handle, F, said parts being so constructed and arranged that the lever, E, when the valve is closed, shall form a spring, by the tension of which the parts are held firmly in position, substantially as set forth.

REISSUES.

2,598.—BROOM.—William H. Cory, New York City, assignee by mesne assignments of Thomas Wright. Patented Nov. 13, 1866.

I claim the splints or strips made of any suitable material inserted in bundles through apertures formed in pairs in the base plate of the broom by looping them as described, said apertures being connected by a groove or recess to accommodate the loop and the latter held to its place by a back or upper plate, substantially as shown and described.

2,599.—MACHINE FOR REMOVING SEEDS FROM RAISINS.—Harvey Locke, Grand Rapids, Mich. Patented Nov. 28, 1865.

First, I claim the combination of mechanism for compressing the fruit and ejecting the seeds with a clamp for attaching the raisin-stoning machine removably to a table or support, substantially as set forth.

Second, I claim the combination of the compressing jaw with the grate and expeller, substantially as set forth.

Third, I claim the retainer, G, in combination with the compressing jaw and seed expeller, substantially as set forth.

Fourth, I claim removing the seeds from the expeller, F, by a clearer, H, substantially as set forth.

Fifth, I claim removing the raisin from the machine by the clearer, I, substantially as set forth.

Sixth, I claim the blade, L, in combination with the clearer, H, for the purposes and substantially as set forth.

Seventh, I claim in a machine for stoning raisins the combination of mechanism for compressing the fruit with mechanism for injecting and removing the seeds, substantially as set forth.

2,600.—PIPE CUTTER.—John Balmore, Harlem, N. Y. Patented Feb. 19, 1867.

I claim, First, In a pipe wrench with a hook-shaped jaw, hinged to a nut through which the shank passes, the round cup-shaped point, c, to operate in combination with the hinged hook-shaped jaw, A, in the manner and for the purpose set forth.

Second, The cutter, D, and groove, d, in combination with the shank, C, nut, B, and hook, A, constructed, arranged and operating substantially as and for the purposes set forth.

2,601.—LIGHTNING ROD.—N. Brittan, Chicago, Ill. Patented July 19, 1864.

I claim, First, A lightning conductor consisting of a single continuous flat strip of copper, as herein shown and described.

Second, In combination with the single continuous flat strip, A, I claim the tubular projecting portion, c, as herein set forth.

Third, The points, I, formed of spiral coils, when combined in one piece with the tubular portion, h, and the continuous flat strip, A, as herein shown and described.

2,602.—HARVESTER CUTTER-BAR CONNECTION.—George W. D. Culp, Allensville, Ind., and Wm. D. Keeney, Florence, Ind. Patented Aug. 25, 1863. Div. A.

We claim so connecting the pitman, B, to the cutter bar, A, of a harvesting machine by means of a single conical or conoidal journal, b, passing into a corresponding-shaped socket in the lug, a, and secured thereto by a friction plate, C, substantially as and for the purpose set forth.

The set screw, D, in combination with the friction plate, C, conical or conoidal journal, b, and lug, a, substantially as and for the purpose set forth.

2,603.—HARVESTER CUTTER-BAR CONNECTION.—George W. D. Culp, Allensville, Ind., and Wm. D. Keeney, Florence, Ind. Patented Aug. 25, 1863. Div. B.

We claim the conical or conoidal point or journal, H, constructed with a shoulder or collar, h', to form a bearing for the confining plate, I, substantially as and for the purpose set forth.

The single conical or conoidal wrist or journal, H, in combination with the solid box, F, having a corresponding socket and confining plate, I, as described and for the purpose set forth.

2,604.—HARVESTER CUTTER-BAR CONNECTION.—George W. D. Culp, Allensville, Ind., and Wm. J. Keeney, Florence, Ind. Patented Aug. 25, 1863. Div. C.

We claim connecting the pitman of a harvesting machine to the crank or fly-wheel wrist by means of a solid-pivoted box, as and for the purposes set forth and described.

The forked pitman, or its equivalent, provided with pivot points opposite each other in combination with the pivoted box provided with centers for said pivot points so arranged that said box may rock freely, as described and for the purpose set forth.

The center screw, G, or its equivalent, in combination with the pivoted box, F, and pitman, B, for the purpose of taking up the slack on the pivots of the pivoted box, substantially as described.

2,605.—GAS BURNER.—Elliott P. Gleason, New York City, assignee of Amos H. Ray. Patented June 15, 1858.

I claim, First, The construction and arrangement within the burner shell of the corrugated cone, D, the heating tube, G, and a suitable perforation or inlet, c, with the mode of operation substantially as and for the purpose described.

Second, In the construction of a gas burner the use of a tip constructed and secured substantially as described.

2,606.—VISE.—John S. Hoar, West Acton, Mass. Patented June 19, 1866.

What I claim as a special improvement in bench vises, of the kind described, or those to turn horizontally on a bedplate, is the combination of all the several parts of the vise, when constructed and arranged substantially as herein described.

I also claim the particular shape, herein shown and described, of the jaws of the vise, such causing them to be eccentric with respect to the shank, E.

2,607.—BAROMETER INKSTAND.—Thomas S. Hudson, East Cambridge, Mass. Patented June 4, 1861. Reissued Nov. 15, 1864.

I claim the improved barometric inkstand consisting of the combination of the dip basin, elevated ink cistern, hollow connecting arm and shell base, substantially as before set forth.

I also claim the combination of the dip-basin, elevated ink cistern, hollow connecting arm and base, with a collar secured to the dip-basin, substantially as set forth.

I also claim the combination of the dip-basin, elevated ink cistern, hollow connecting arm and base, with a funnel cup, substantially as before set forth.

I also claim the combination of the dip-basin, elevated ink cistern, hollow connecting arm and base, with a cover for the dip-basin, substantially as before set forth.

2,608.—HARVESTER.—Philo Sylla, Elgin, Ill., and Augustus Adams, Sandwich, Ill., assignees by mesne assignments of themselves. Patented September 20, 1853. Reissued May 17, 1859.

We claim, First, The combination of a finger beam, with slotted guard fingers, a reciprocating scolloped cutter, a double hinge connection between the finger beam and the main frame, and a driving shaft for the cutting apparatus, parallel or nearly so, to the ground.

Second, The combination of a double hinge floating finger beam with slotted guard fingers, a reciprocating scolloped cutter and a removable platform for converting the machine from a mower to a reaper.

Third, The combination of a finger beam with slotted fingers, a reciprocating scolloped cutter, a hinged connection to the main frame, a removable platform, and a reel.

Fourth, The combination of a finger beam with slotted fingers, a reciprocating scolloped cutter, a hinged connection to the main frame, and arms or levers, or their equivalents, for adjusting the hight of the cutting apparatus.

2,609.—MACHINE FOR WRINGING CLOTHES.—The Bailey Washing and Wringing Machine Company, Woonsocket, R. I., assignees by mesne assignments of S. A. Bailey. Patented April 5, 1859. Reissued June 28, 1864.

We claim, First, The employment of the wooden spring piece, a a, which is divided into two parts at its center, each part being slotted from the place of division, as shown in the drawing, towards its outer end, the same being covered by rubber cylinder, substantially in the manner and for the purpose specified.

Second, The spring, F, in combination with elastic rollers for the purpose set forth.

Third, We claim, in a wringing machine, substantially of the kind herein described, the combination of elastic rollers, impervious to water, with the standards, B, and vessel, A, secured and operated substantially as and for the purpose specified.

2,610.—HARVESTER.—Cyrenus Wheeler, Jr. Auburn, N. Y. Patented Dec. 5, 1854. Reissued Jan. 3, 1860.

I claim in combination with a harvester frame that is free to vibrate about a gear center, a laterally projecting finger bar, so hinged to one end or corner of said frame, as to permit the finger bar at each end to follow the undulations of the ground over which it is drawn.

2,611.—METHOD OF RAISING AND LOWERING THE CUTTER OF HARVESTERS.—C. Wheeler, Jr. Auburn, N. Y., assignee by mesne assignments of Jonathan F. Barrett. Patented July 10, 1865.

I claim, First, The combination of the frame carrying the cutting apparatus, vibrating about a gear center, and the vibrating draft frame.

Second, I also claim the combination of the frame carrying the cutting apparatus vibrating about a gear center with a vibrating draft frame and the lever or its equivalent for raising and lowering the cutting apparatus attached to said frame.

Third, I also claim the combination of the draft frame attached directly to the axle of the driving wheels with a frame carrying the cutting apparatus, vibrating about a gear center.

Fourth, I also claim the combination of a vibrating draft frame a frame carrying the cutting apparatus vibrating about a gear center and a drivers seat attached to said draft frame.

2,612.—BASE BURNING STOVE.—Dennis G. Littlefield, Albany, N. Y. Patented Dec. 9, 1862. Antedated Nov. 26, 1862.

I claim, First, The mill grate, B A B, constructed and operating substantially as and for the purpose herein described.

Second, I also claim the flaring portion of the center case, M', in combination with the furnace, D, substantially as and for the purpose described.

Third, I also claim the furnace, D, opening into and in combination with the chamber E E E, and so constructed as to emit both light and heat from the burning coal, in an upward direction, substantially as and for the purpose set forth.

Fourth, I also claim in combination with the subject matter of my third claim, the plates, f f and c c, which form the floor of the chamber, E E E, and a register opening from the ash pit, substantially as and for the purposes set forth.

Fifth, I also claim the compelling of the draft from the grate while the fire is kindling and previous to and during the process of replenishing the magazine to pass through the magazine for the purpose specified, by the means I have divised or by any other analogous devices.

Sixth, I also claim the chamber, I, communicating with the flue, P, whereby air finding admission through the aperture over which rests the cover, K, passes at once to the exit flue, as specified.

Seventh, I also claim the divided flue, K, around the chamber, I, and forming a communication between the chambers, E E E, and the flue, P, whereby the products of combustion are drawn to the smoke pipe and chimney and the heat rendered more effective by its proper diffusion within the burner as herein set forth.

Eighth, I also claim the plate, V, forming the top of the magazine, and projecting out over it, to the outer case, and having apertures, o, at the front side, and another u, into the flue, P, as described, substantially as and for the purposes set forth.

Ninth, I also claim such adjustment of parts of the magazine stove, as will carry the whole volume of the heated products of combustion to the front region of the stove, and thence to the rear part of it, over the top of the magazine in the manner I have described or by any other analogous devices.

Tenth, I also claim the gate like sliding cover, N, in combination with the magazine, H, as and for the purpose herein set forth.

Eleventh, I also claim the inward deflection of the case, M2, in its relation to, and combination with the furnace, and chamber, E E E, substantially as and for the purposes set forth.

Twelfth, I also claim the window openings in the outer case at M2, in combination with the recession of the case, substantially as and for the purposes set forth.

2,613.—MACHINE FOR SHEARING SHEEP.—Richard B. Walker and Lewis Miller, Akron, Ohio, assignees of John W. Jenkins. Patented Oct. 21, 1856.

First, We claim a flexible and extensible connection, between the stationary or first moving power, and the shears, whereby the shears may, while cutting, be moved over and around the body of the animal, substantially as described.

Second, I also claim so constructing the shears of a power shearing machine, as that it can be held and guided by one hand, leaving the other hand of the operator free, substantially as described.

Third, I also claim encasing the mechanism that drives the shears, so that the wool or fleece cannot become entangled therein, substantially as and for the purpose set forth.

Fourth, I also claim driving the vibrating arm to which the moving shear or cutter is attached, directly from an eccentric, substantially in the manner described.

Fifth, I also claim a guard plate or projection under the stationary fingers to regulate the hight as well as the length of cut at each vibration of the shear, substantially as described.

Sixth, I also claim a presser to regulate the pressure of the vibrating knife or shear upon the stationary fingers, substantially as described.

Seventh, I also claim the placing or locating of the power by which the shears are vibrated remote from the shears, thus leaving the hands of the operator free, one to hold the animal, the other to guide and direct the shears, substantially as described.

Eighth, I also claim so attaching the fingers to the bed plate, as that they can be readily detached for being sharpened, substantially as described.

Ninth, I also claim the arrangement of a slotted vibrating plate or sway bar, so that a wrist may give motion to it laterally without moving it longitudinally, substantially as described.

Tenth, I also claim guiding and directing the cutters or shears by the hand of the operator, when said cutters are driven by power independent of said operator, substantially as described.

2,614.—SHEEP-SHEARING MACHINE.—Richard B. Walker and Lewis Miller, Akron, Ohio, assignees of John V. Jenkins. Patented Sept. 8, 1857.

I claim attaching or suspending the cutter and its connections to an extended or projecting arm, substantially as and for the purpose described.

I also claim transmitting the power to drive the shear cutter, through or by means of one or more endless belts, and one or more shafts and one or more universal joints, whereby greater range of motion can be given to the cutter, and increased facilities to the operator in guiding them and in managing the animal to be sheared, substantially as described.

2,615.—MACHINE FOR SHEARING SHEEP.—Lewis Miller and Richard B. Walker, Akron, Ohio, assignees by mesne assignments of A. H. Kennedy. Patented Jan. 30, 1866.

First, I claim the extension arm made with a hinge so that it can be raised or lowered at the will of the operator, substantially as and for the purpose set forth.

Second, I also claim in combination with the extended arm, the balancing of it, so that the operator shall be relieved of the weight of the arm in raising it, and also for the purpose of taking up the slack of the connecting shaft, substantially as described.

Third, I also claim the coiled wire shaft for transmitting the driving power to the shears, substantially as described.

Fourth, I also claim spanning or extending the arm, C, over the driving shaft and pulley, for the purpose of better support, more strength, and greater compactness, substantially as described.

DESIGNS.

2,652.—BOTTLE.—Samuel A. Whitney, Glassboro, N. J.

2,653.—FLOOR OIL CLOTH OR CARPET PATTERN.—Charles T. Meyers, Bergen, N. J. assignor to Edward C. Sampson, New York City.

2,654.—SPOON OR FORK HANDLE.—Horace C. Wilcox, West Meriden, Ct.

Inventions Patented in England by Americans.

[Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

865.—CENTRAL-FIRE CARTRIDGE FOR BREECH-LOADING FIRE-ARM.—Benj. S Roberts, Maj. Gen. U. S. Army. March 20, 1867.

906.—SEWING MACHINE.—Sidney M. Tyler, Brooklyn, N. Y. March 30, 1867.

824.—STEAM HEATING AND VENTILATING APPARATUS.—Adolph Sternfeld, Boston, Mass. March 21, 1867.

838.—APPARATUS FOR SEPARATING THE GROUNDS FROM THE LIQUID IN MAKING COFFEE.—Henry J. Grisword, Boston, Mass. March 22, 1867.

853.—REINS FOR HORSES.—John Muir, Mary A. W. Ringler, and Sarah E. Kelly, New York City. March 23, 1867.

855.—APPARATUS FOR EXTINGUISHING LAMPS.—Nathaniel Mansfield, Boston, Mass. March 23, 1867.

859.—ROTARY DIGGING MACHINE, AND TEETH FOR THE SAME.—George G. Lobdell, Wilmington, Del. March 25, 1867.

971.—PAPER MACHINERY.—Francis Curtis, Newton, Mass. April 1, 1867.

851.—JUMPING OR SKIPPING HOOPS.—Charles L. Browne, Brooklyn, N. Y. March 23.

853.—COTTON-BALE TIE, ETC.—Henry Fassmann, New Orleans, La. March 25, 1867.

864.—MACHINERY FOR CUTTING CHANNELS IN STONE, ETC.—George J. Wardwell, Rutland, Vt. March 25, 1867.

866.—BREECH-LOADING FIRE-ARMS AND CARTRIDGES.—Loughlin Conroy and Tristram D. Vanderveer, New York City. March 25, 1867.

871.—STEAM AND VACUUM GAGE.—Emmett Quinn, Washington, D. C. March 26, 1867.

876.—SCREWS.—Valentine Fogerty, Boston, Mass. March 26, 1867.

882.—VALVE GEAR OF STEAM ENGINES.—William Wright, New York City. March 26, 1867.

883.—LOOMS.—Erastus B. Bigelow, Boston, Mass. March 26, 1867.

894.—MACHINE FOR PAINTING METALLIC SURFACES, ETC.—Henry Fassmann, New Orleans, La. March 27, 1867.

919.—APPARATUS FOR CONCENTRATING THE EXTRACTS OF BARK FOR TANNING AND OTHER PURPOSES.—Benjamin Irving, New York City. March 28, 1867.

3,429.—FASTENING FOR POCKET BOOKS, DIARIES, ETC.—John Dubber and Carlos Bardwell, N. Y. Dec. 29, 1866.

912.—SADDLE STIRRUPS.—Osborne Macdaniel, New York City. March 28, 1867.

920.—MODE OF AND MACHINERY FOR OBTAINING THE EXTRACTS OF BARK FOR TANNING AND OTHER PURPOSES.—Benjamin Irving, New York City. March 28, 1867.

951.—COUPLING TELEGRAPH AND OTHER WIRES.—David McComb, Memphis, Tenn. March 30, 1867.

958.—BROOM.—Eli P. Cooley, New York City. March 30, 1867.

965.—COMPOSITION FOR TREATING FLUIDS EMPLOYED FOR ILLUMINATING PURPOSES.—Hiram B. Wellman, Indianapolis, Ind. April 1, 1867.

966.—MODE OF AND MEANS FOR CLOSING AND FASTENING THE PORT LIGHTS OF SHIPS AND OTHER VESSELS.—Edward S. Hidden, New York City. April 1, 1867.

970.—SEWING MACHINERY.—James A. House and Henry A. House, Brooklyn, N. Y., April 1, 1867.

978.—APPARATUS FOR MANUFACTURING BOXES FROM SHEETS OF PAPER, METAL, AND OTHER MATERIAL.—Bryant Clarke, New York City. April 2, 1867.

920.—CENTRIFUGAL SUGAR MACHINE.—Alexander Mackey, New York, and Eberhard Muller, Williamsburgh, N. Y. April 2, 1867.

1,007.—REVOLVING BREECH-LOADING FIRE-ARMS.—Wm. Herrick, New York City. April 3, 1867.

1,045.—COMBINED WATER METER AND FORCE PUMP.—Elihu Spencer and Thomas Stephens, New York City. April 6, 1867.

EXTENSION NOTICES.

Julius Herriet, of New York City, having petitioned for the extension of a patent granted to him the 2d day of August, 1853, for an improvement in elastic type for printing on irregular forms, for seven years from the expiration of said patent, which takes place on the 2d day of August, 1867, it is ordered that the said petition be heard at the Patent Office on Monday the 15th day of July next.

William Miller, of Pensacola, Florida, administrator of the estate of Joseph B. Miller, late of Jersey City, N. J., deceased, having petitioned for the extension of a patent granted to the said Joseph B. Miller the 2d day of August, 1853, for an improvement in submarine tunnels, for seven years from the expiration of said patent, which takes place on the 2d day of August, 1867, it is ordered that the said petition be heard at the Patent Office on Monday the 15th day of July next.

James C. Cooke, of New Haven, Conn., having petitioned for the extension of a patent granted to him the 27th day of July, 1852, and reissued the 7th day of April, 1863, for an improvement in forming button backs and connecting the eyes thereto, for seven years from the expiration of said patent, which took place on the 27th day of July, 1866, this application having been authorized by Act of Congress, it is ordered that the said petition be heard at the Patent Office on Monday the 29th day of July next.

Thomas Crossley, of Bridgeport, Conn., having petitioned for the extension of a patent granted to him the 16th day of August, 1853, for an improvement in printed carpets, for seven years from the expiration of said patent, which takes place on the 16th day of August, 1867, it is ordered that said petition be heard at the Patent Office on Monday, the 29th day of July next.

NEW PUBLICATIONS.

PART FOUR OF THE MECHANICIAN AND CONSTRUCTOR FOR Engineers, by Cameron Knight, is received. The plates and text still relate to the details of engine forging, and comprehend some excellent examples. We heartily commend this work to engineers and machinists. It can be obtained of D. Van Nostrand, corner of Broadway and John street, this city.

SCREW PROPELLER, SCREW VESSELS, AND SCREW ENGINES, by John Bourne, C. E., Part XIX., for April, is at hand. This number contains plans and drawings of the screw steamers *European* and *Frankfort*, the U. S. turret vessels *Chickasaw* and *Nauset*, and plans of engines and boats for canal service. The number sustains the previous high character of the work. Van Nostrand is agent for the series.

BEET ROOT SUGAR, and its Cultivation. By E. B. Grant. Boston: Lee & Shepard. For sale by D. Van Nostrand, New York.

This book fully reviews the whole field, states results in France and elsewhere, and warmly urges beet culture for sugar in this country.

THE PEAT JOURNAL. By Leavitt & Hunnewell, and for sale by D. Van Nostrand.

This volume glorifies peat to the utmost possible degree, alleging that it is found in almost every State of the Union, and that it is good, not only as a fertilizer, but serviceable for fuel, gas, gunpowder, pavements, paper, buildings, tanning, embalming, disinfecting, etc., etc.

MANUAL OF ELEMENTARY GEOMETRICAL DRAWING. By S. Edward Warren, C.E. New York: John Wiley & Son, 535 Broadway.

This book explains the process of construction in wood and mason work, and is designed for schools and for the self-instruction of inventors, artizans, etc. It is what its title imports, a valuable volume for beginners. We have before noticed Mr. Warren's "Problem of Shades and Shadows," and welcome every addition from his pen to the domain of science. His works are always clear, comprehensive, and valuable.

THE MANAGEMENT OF STEEL. By George Ede. From Fourth Edition, Revised and Enlarged. New York: Appleton & Co., 443 Broadway.

We have had occasion several times to quote from the treatise of Ede on steel, and feel gratified at the appearance of this reprint. His book should be found in the collection of every worker of steel, as it contains more facts with less twaddle, more useful suggestions with less assumption of superior knowledge, on this subject, than any other treatise with which we are acquainted. It is a really valuable work.

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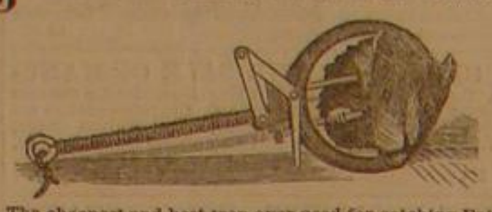
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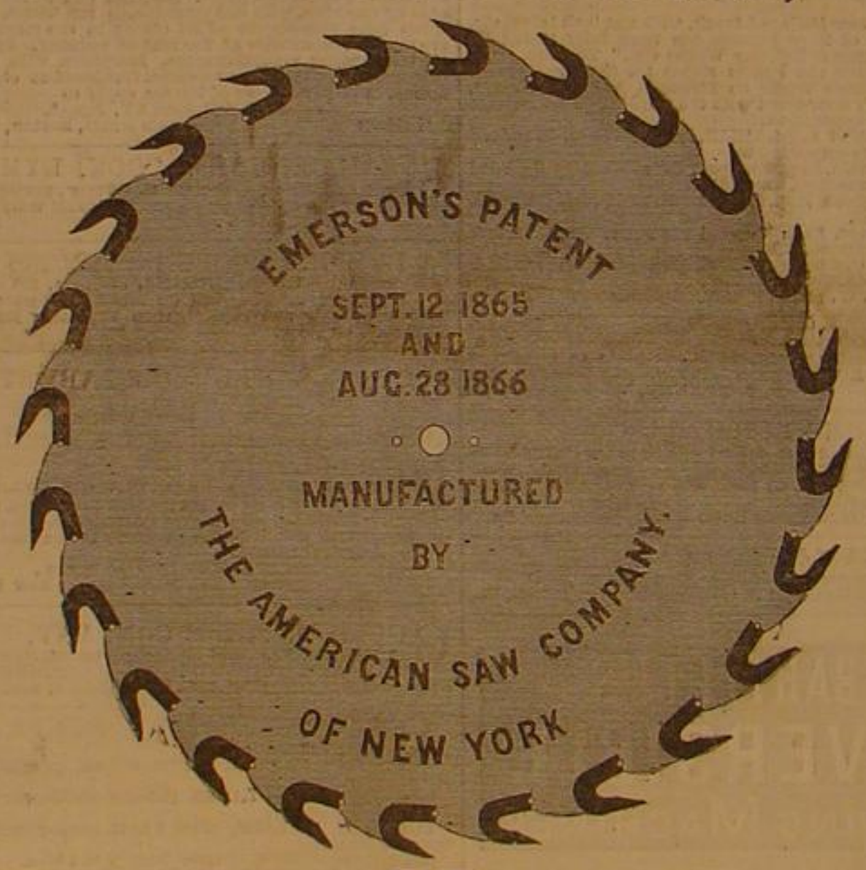
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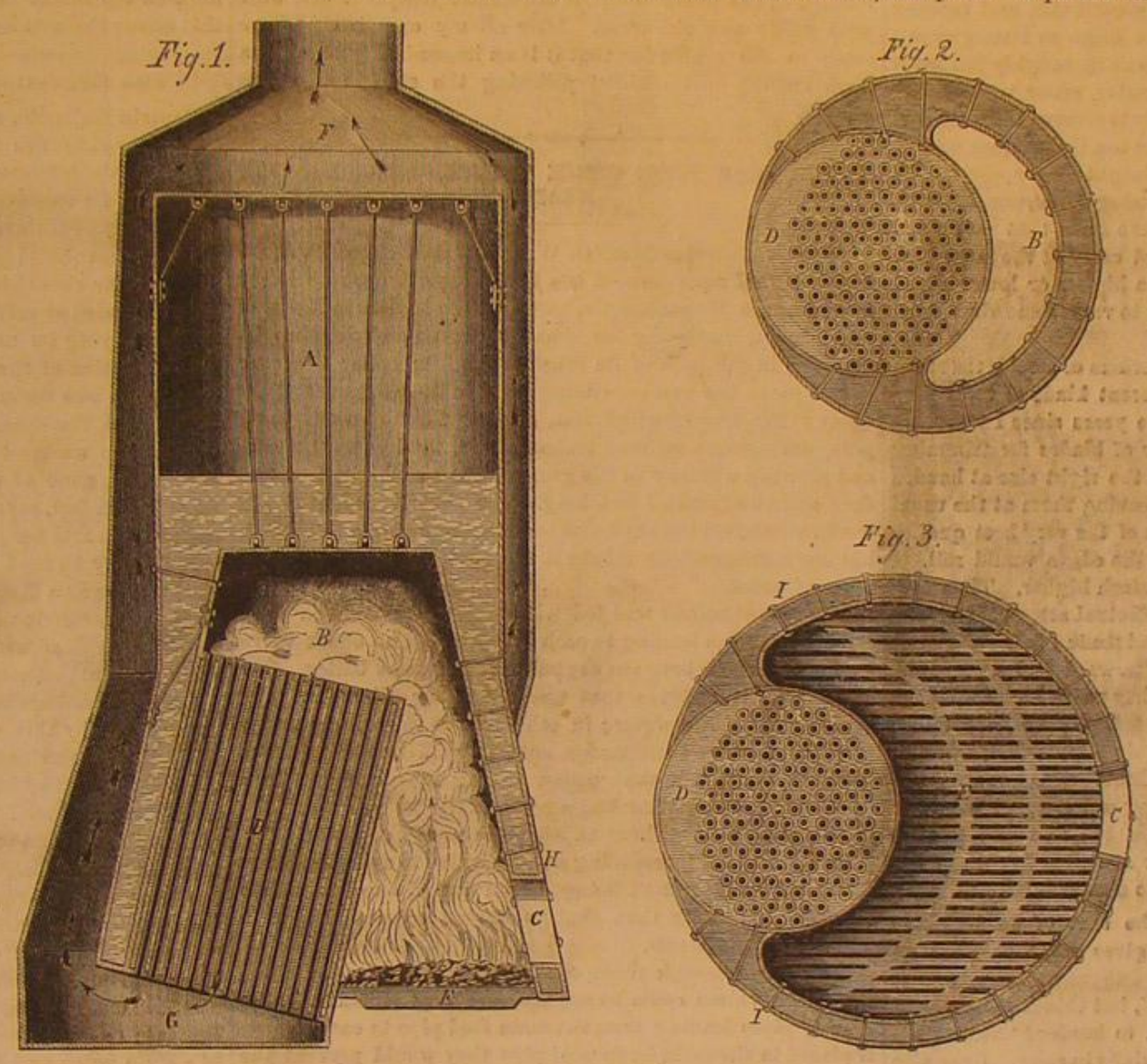
Vol. XVI.—No. 23. [NEW SERIES.] NEW YORK, JUNE 8, 1867. $3 per Annum. [IN ADVANCE.]

Densmore's Improved Boiler.

The engravings are views of a boiler which since its first introduction, five years ago, has given eminent satisfaction in its qualities for rapidly generating steam, keeping up a constant circulation of water, and economizing fuel. Over two hundred of them are now in use, in all parts of the country, for stationary and steamboat purposes. Its construction appears to be very favorable to perfect combustion, and the facts sustain this opinion.

The lower portion of the boiler is in the form of a truncated cone and the remainder cylindrical. The fire box is of unusually large proportions, conforming to the shape of the lower part of the shell. A represents the shell of the boiler and B the fire box. In this box, on the side farthest from and opposite to the door, C, is a tube cylinder, D. This cylinder is inclined, conforming to the slant of the boiler, a small portion of its circumference forming the outer shell, as seen in Figs. 2 and 3. The lower front portion of this cylinder extends below the grate, E, and the heat of the fuel must impinge on the inclined front of the cylinder as it rises, thus securing a continuous circulation of the water. The arrows show the direction the gaseous products of combustion take. They rise to the space between the top of the cylinder and the crown sheets, then turn, passing down through the tubes —the interspaces between which are filled with water—to the bottom of the cylinder. From thence they rise in the space between the jacket, F, and the shell of the boiler to the smoke stack on the top. If the iron jacket is not used the smoke may escape through the space, G, directly to the chimney.

Fig. 2 is a transverse section across the boiler, taken on a line with the top of the front of the tube cylinder, and Fig. 3 is a similar section just over the grate. It will be seen that the area of the grate is of crescent shape, and that by the inclination of the tube cylinder and the sides of the fire box the space is gradually contracted to the top of the cylinder. This insures a very large grate surface and a correspondingly extended heating surface on the convex front of the tube cylinder, the concave sides of the fire box, and its top.



DENSMORE'S UPRIGHT BOILER.

The steam room above the water line is ample so that only dry steam is delivered to the engine, and the boiler is not liable to foam. For burning bituminous coal this boiler is especially adapted. When built for this purpose the first row of stay bolts above the door at H are hollow, screwed through the outer and inner shell, and upset and riveted. These extend around from point to point marked I in Fig. 3. A strap having holes of corresponding diameter with those in the hollow stays and at the same distance apart, is secured to the outer surface of the boiler and held by lugs as guides, which permit it to slide by means of a lever to act as a damper, covering or uncovering the holes in the stay bolts as may be desired. When uncovered, atmospheric air rushes in in sufficient volume to add oxygen to insure the perfect combustion of the fuel. We have seen these boilers thus arranged and burning bituminous coal, and the smoke issuing from the stack was visible only as a steam-like vapor, having parted with its carbon, which in fine particles usually makes the unconsumed smoke from this kind of fuel so dense and black.

This boiler has more than double the amount of fire box surface to a foot of grate than ordinary boilers, and all of this surface is inclined toward the fire, so that the radiation of the heat is equal on every part of it. The inclined position of the tube cylinder and of the walls of the fire box, allows the steam, as it is formed against these surfaces, to leave them and flow upward against the outer shell, leaving the water solid against the fire plates preventing them from burning. The water is fed in around the bottom of the tubes and the strongest heat being at the upper portion of the tubes the cooler water is not lifted rapidly. This boiler is adapted to any kind of fuel which is used under other boilers. It is made of the best iron and thoroughly stayed in all its parts. It is built of different sizes from fifteen to three hundred horse power. No masonry is required in setting it, the boiler resting on legs.

Patented Sept. 15, 1863. For further particulars address Densmore & Black, patentees and manufacturers, 388 West 43d street, New York city.

THE OFFICIAL CATALOGUE of the products of the United States exhibited at the Paris Exposition is a pamphlet of 172 pages, just published in French, German and English. Forty-three pages are devoted to a statistical and geographical review, compiled, if we may judge from the closing paragraph, by some enthusiastic and patriotic Yankee. The paragraph alluded to exhibits the celebrated truth that as our population was thirty-five and a half millions in 1865, so by the law of nature it must become equal to the population of the globe, in 1900.

DUDDERAR'S TREE PROTECTOR.

The "borer" is one of the worst pests against which the



fruit raiser has to contend. Its operations are comparatively secret, while the catterpillar works in broad daylight. The engraving represents a device calculated to prevent, rather than to remedy, the depredations of the borer. It is intended especially for peach trees, although adapted to other fruit trees.

It is a cylinder of sheet metal pierced with minute holes for the admission of air. It can be opened and placed around the trunk of a tree and secured by a rod passing through ears which project through holes in the outside lap of the cylinder. The cylinder is sunk a few inches in the earth and held by the soil being pressed around it and over the feet or legs secured to it At the top is attached a piece of oiled cloth or painted canvas the top of which is held closely around the trunk by a string. The longitudinal seam is then sewed up or secured by a cord run in, so that all is kept tight below that point. A patent for this device was obtained Jan. 16, 1867, by George W. Dudderar of Unionville, Md., whom address at that place for any additional information desired.

Telegraphs in Europe.

The Swiss telegraph, of which there are 1,130 miles of line, or fourteen miles for every hundred square miles of territory—has been for some years in the hands of the Government. The charge is uniformly one franc, and a quarter franc for every additional ten words, with free delivery by carrier within three miles, or by mail at greater distances. Postal money orders are also transmitted in the same way. The number of telegrams in 1865 was 364,000, and the proportion of telegrams to letters steadily increases. As the lightning travels up and down and through the snows with equal facility, it has a peculiar advantage over the mails in a country like Switzerland.

In Belgium, the telegraph is still cheaper, the uniform charge being only half a franc, or less than one dime for the first twenty words. The system has belonged to the Government since 1850, and every post office is either a telegraph office or an office for forwarding telegrams by messenger or mail as may be desired. There are 2,000 miles of line. Messages are written on stamped paper, and delivered free of further charge for a distance of a mile and a quarter, beyond which they may be forwarded express or free by mail. If the message does not reach its destination as soon as the mail, or is incorrectly sent, the price is returned. In 1860, at a charge of a franc and a half, there were 80,000 telegrams, being one to 218 letters; in 1865, at one franc, there were 332,700, being one to 48 letters. In December, 1865, the charge was reduced to half a franc, the present rate and the cheapest in the world.

In Prussia, the lowest charge by the national telegraph is about 15 cents. In Paris the postal telegraph system has been tried with success, with a uniform charge of half a franc; the number of dispatches having increased tenfold within six months after the reduction from one franc to the present rate.

Microscopic.

Mr. Dancer has executed a very curious and certainly minute sort of inquiry into the composition of furnace dust, *i. e.*, the extremely fine powder which accumulates in flues from the burning of coal, apart from sooty or carbonaceous accumulations. He washed the dust carefully, to separate the purely mineral ingredients, and by placing it on a slightly inclined glass, made the spherical particles to separate themselves from those of irregular shape, by rolling down the incline. These, examined under the microscope, were found to be quite interesting objects. Many of them appear to be perfectly spherical though less than $\frac{1}{100}$ of an inch in diameter, solid or hollow, with a brilliant polish, and in beautiful variety, crystalline, white, yellow, brown, black, agate or carnelian of various shades, and some like rusty cannon balls. Mr. Dancer supposes that these are mostly silicates, or various kinds of glass, colored, when not transparent, with different oxides, carbon, etc. He accounts for their shape by supposing that they have been thrown off in scintillations, of course in a molten state, in which by a law of matter they assume a spheroidal form. Many of them appear to be ferrous oxides or "iron ore," probably formed by the action of heat on the iron pyrites in the coal, and afterwards, in many cases, found to have been reduced to metallic iron and encased with an enamel of silicate. Hence the proportion of iron in the coal dust is much greater than is revealed by the analysis of coal ashes.

MANAGEMENT OF STEEL.

We have given considerable room to communications on this subject, but as it is one which is not surpassed in importance by any other process in the mechanic arts, it is proper that the suggestions and experience of practical men should be laid before our readers whenever they contain any new facts or support disputed theories. Below are extracts from three communications, each of them from practical steel workers. The first is from "C. H.," of Collinsville, Conn. He says:—

I have read with pleasure the articles on working and tempering steel in Nos. 7, 12, 15, and 16, current volume, and while agreeing with many of the statements of your correspondents, there are others to which I should take exceptions. In the one by "E. M. F.," in No. 16, he says: "We can neither depend upon the degree of polish nor color of surface. The secret lies in the working of the steel and in the proper degree of heat given the steel to be hardened." This is true in a certain sense, and yet when the steel has been properly worked, and hardened at a proper heat, some guide is needed in bringing it to the right temper, and I know of none so sure as the color. But all tools do not require the same degree of hardness. Take for instance, a bar of steel of the proper quality for wood-cutting tools, and make from it an ax, framing chisel, carpenter's hatchet, drawing knife, and turning chisel. Work it carefully, harden in brine as strong as salt will make it, at the lowest heat that will thoroughly harden it through, wash off the salt in fresh water, scour with a piece of common grindstone, just sufficiently to remove the scale, and draw the temper of the turning chisel to a light straw, merely changing the color; drawing knife, a bright copper; carpenter's hatchet, copper with purple spots; framing chisel, purple; chopping ax, deep blue; and we shall have tools that will stand any reasonable amount of strain, and carry at the same time a keen, smooth edge. Of course if a higher or lower grade of steel is used it will be necessary to vary somewhat from this.

One cause of trouble among the workers of steel is that they do not get steel adapted to the different kinds of tools they make. To illustrate this point, some years since I was making cast-steel hoes. I wanted a pair of blades for trimming shears, and having nothing else of the right size at hand, I made them from a bar of hoe steel, leaving them at the usual temper. But although the steel was of the very best quality of its grade, they would not stand; the edges would roll. I hardened them again, leaving them much higher. Then they would crumble and after several ineffectual attempts to make them cut I gave it up as a bad job, and made a pair from steel adapted to that kind of work, and afterward had no trouble. From my experience of more than thirty years, I am convinced that three things are absolutely needed to make good tools: 1st, steel of a grade adapted to the required tool; 2nd, a proper working of the steel in making, not heating too hot nor hammering too cold; 3d, proper hardening and tempering. Now if any man expects to succeed in the business and make a uniformly good tool without proper attention to each of the points named, I think he is doomed to disappointment.

"B. F. S.," also of Collinsville, the seat of an immense manufacture of axes, scythes, etc., gives some opinions on color and heating. He says:

E. M. F. has a good article in No. 16, but thinks steel should only be heated to a dark cherry red to harden. Now this is too indefinite, as cherries differ materially in color. Eyes also differ in judging of color. A cherry-red heat on a forge under the window and one on a forge in a shady place are two very different heats. Again the heat required by high and low steel cannot be governed by the color of the same cherry, nor can a piece of steel one-eighth of an inch thick be properly hardened with the heat required by a piece one-half of an inch in thickness. I am of the opinion that the only proper test as to the amount of heat required is to be had by experiment. Now we find that the most approved brands of steel are nearly uniform in themselves; then we are safe in taking a piece and find the lowest point of heat at which it will receive a thorough hardening and the experienced eye must follow the lead thus indicated, often applying the test to keep the eye right. In the article of "W. S. D.," in May 11th, he speaks of tempering by one process, or of giving steel just the desired hardness without the necessity of drawing the temper, but thinks it is a matter of such nicety as to be impracticable. I differ somewhat from him.

Assuming that a piece of good steel has been properly forged and the desired refinement given it by a judicious hammering, my experience is that the steel receives an additional refinement by a thorough hardening, and in proportion as it lacks in being made as hard as it can be by the hardening process, just so much it is lacking in its perfect refinement; and when I speak of steel being made as hard as it can be I repudiate the idea that an extra high heat will produce an extra hardness; a high heat may produce an extra brittleness which some mistake for hardness, but the fact is such brittle steel will file easier than if hardened at just the proper heat.

"H. G.," of Mansfield, Ohio, gives some practical hints drawn from an experience of twenty years. He says:

In ordering my steel I always state the use for which it is intended, as all know that much depends upon the quality of the material, and we cannot make a fine tool from a coarse steel. Steel should never be heated above a degree sufficient to work it into the required shape; at the same time it should never be hammered when lower than a cherry as it becomes hard and brittle, and in most cases will check or become flawy. When hardened, steel should be worked in a good clean fire (charcoal fire is the best) and should be hammered sufficiently to thoroughly work the steel, but should never be drawn from a large bar to a small one, as it will invariably crack or spring in hardening; it should be hammered as smooth as possible, especially when it is to be hardened without finishing, as a smooth piece of steel is less liable to crack in hardening than one that may be full of hammer marks or scales. When heated to harden, heat very slowly and just sufficiently to take the temper, and when plunged into the water under no circumstances should it be withdrawn until cool, or not one degree above the water in which it is plunged, as it will crack and fly then if ever, and there are several instances where people have lost the use of an eye by withdrawing steel from the water before it was thoroughly cool. After the steel has been hardened it should be polished even and fine, always in one direction, and be drawn as slowly as possible, and for the finer qualities of work should never be cooled while drawing, but should be drawn gradually enough to lay it down and let it cool off without checking, as it will make it tougher, and not so liable to crack. Many smiths use tallow to bring out the color, but the utility of this I very much doubt except in some few cases where the work is very small and difficult to polish. I think, owing to the difference in steel and the nature of the work for which the tool is intended, that the exact color cannot be laid down with any degree of accuracy and is only to be ascertained by experience and careful study of the nature of the steel and the work to be performed, as the lower the steel the higher temper it will bear with safety and *vice versa*. After all my experience I have come to the conclusion that it is an impossibility to make a good cutting tool without polishing the steel to draw the temper.

BOILER FEED PIPES, CHECK VALVES, AND CAST-IRON HEADS.

From a correspondent, G. W. D., of Providence, R. I., we have received some account of a boiler explosion which lately took place in Massachusetts. One of the boilers in a nest of eight, burst, displacing the remaining seven and carrying destruction in the path of its fragments. The boiler was rent in two parts, one part imbedding itself in the chimney and the other flying two hundred feet, cutting through a telegraph pole, damaging a railroad embankment, tearing up the rails and plowing a furrow in the ground, after striking, two feet deep and two hundred feet long. The superintendent of the works attributed the explosion to excess of water in the boiler, but our correspondent thinks it was occasioned rather by absence of water.

The nest of boilers was fed with water by a common pipe, having branches leading to each boiler, and one check valve on the main pipe between the pump and nearest boiler. Our correspondent believes that unequal firing disturbed the equilibrium of the water; in other words that firing under one boiler more than under another will create a greater pressure of steam in that boiler, forcing the water out into the cooler boilers, thus leaving the boiler which bears the most intense heat without an adequate supply of water.

He approves of introducing a check valve to every boiler to prevent the water from being driven out of one boiler into another, and, better than that, to employ competent men to manage boilers in sets.

It seems as though there could be only one place to which the check valves could be applied, and that would be in the branch pipes leading from the main feed pipe to each boiler. If placed in the main horizontal pipe they would prevent the water from backing into one boiler, but not into that on the other side. If the water-feed pipes are large enough and the connection between the steam spaces ample, it seems there should be but little trouble in equalizing the pressure and the level of water in the different boilers without any check valves. Preferably, independent feed pipes to each boiler should be employed; then each boiler could be treated as a separate generator. If not, would it not be well to introduce cocks between the boilers to be attended to by the fireman or engineer? Sometimes one or two boilers of a nest are used while the others remain idle. In this case there is a means to stop both water and steam communication between those in use and those at rest. Under such circumstances the equilibrium must depend upon the knowledge, carefulness, and attention of the fireman, or the constant oversight of the engineer.

A similar explosion to that mentioned by G. W. D. is described by a correspondent from Jacksonville, Fla. In this case the boiler that exploded was the middle one of three plain, cylindrical boilers, forty feet long and forty inches diameter. The cast-iron head blew out, the disk cut from the flange as evenly as though turned off in a lathe. The head itself merely blew out and lodged at the foot of the chimney directly behind the boiler, while the shell went at least three hundred feet, cutting timbers off clean and dragging its two companions from their beds about their own length. The writer attributes the blowing out of the cast-iron head to its vibration by alternate expansion and contraction, or bulging by being heated during the day and cooled during the night. This is undoubtedly the reason why it gave way as it did, but why should that particular boiler head yield and not either of the others? More internal pressure was exerted on this boiler than on the others or all would have gone and at the same time. Our informant does not describe the means of communication or of separation between the boilers, but only says "there was abundant means of communication both for water and steam between all these boilers, and no greater pressure could exist in one boiler than in the others." The explosion took place in the morning before the machinery had been put in operation. The watchman states that there was plenty of water and the steam gage stood at seventy pounds. The engineer says he left the boilers the night before with three gages of water, and our correspondent deemed the sound of the whistle which he heard a few minutes before the explosion not to indicate a high pressure of steam. All this may be and yet there may be circumstances in regard to the communication between the boilers which are not mentioned by our correspondent which would, in a measure at least, afford a probable reason for the explosion. We know a case where a boiler in a set was exploded when ample means of communication existed, but the steam and water connections could be closed by cocks. Notwithstanding the asserverations of the fireman, it was evident that the exploded boiler was without a proper supply of water. If the steam communication was closed and the water communication open between the different boilers, and one boiler was fired harder than another, it would not require a very great preponderance of steam pressure to empty the water from the heated boiler into the others, leaving that one in a most dangerous condition.

As to making cast-iron heads thick enough to prevent springing, it may be questionable whether this would be as effectual and economical a remedy as making them of wrought iron and of hemispherical form as is the practice in England. This is a far better form to resist internal pressure than the flat disk head. In flue boilers the flues themselves are usually the only stays employed in retaining the heads in position, but the expansion of the flues is sufficient to exert an enormous force on the heads. It is no wonder that explosions occur from this cause; the wonder is that they are not more frequent.

The Repeating and Breech-loading Rifle.

Captain Majendie, an assistant superintendent prominently employed in the trials of arms and ammunition in England, lately delivered a lecture before the Royal Institution, in which he reviewed the progress of breech-loading rifles, concluding with the decided opinion that the final solution of the problem would not be reached until the magazine or repeating rifle should be so simplified and perfected as to meet all exigencies of service, at the same time as a single loader while carrying its magazine complement ready in reserve. The alteration of the Spencer repeating rifle to meet this requirement was the subject of an interesting trial on the 26th of April, at Vincennes, France, where it is reported to have elicited the warmest approbation from the French military authorities, none of whom were previously well disposed toward it. In fact, says the *Mechanics' Magazine*, the only drawback to this arm for general military purposes, has been that it could only be used as a repeater, and now that it can be used thus or as a direct breech-loader, at will, the French authorities are convinced of the efficiency of the rifle every way: the remarkable accuracy and unparellelled rapidity of fire—21 shots a minute—having extorted unqualified admiration.

Very interesting characteristics of warfare with the Indians, as modified by this weapon in the hands of our troops, are recalled from the testimony of Lieut. McMurray, of the 1st artillery. One day in the fall of 1865, two mountain men and nine soldiers, armed with this rifle, fought their way steadily on foot through an encircling force of not less than 1200 to 1500 Sioux and Cheyennes. The moral effect of the constant fire from so few arms, and its accuracy at long range, kept the Indians out of arrow range as effectually as the dreaded "shooting wagons" of the artillery, and the party regained the command without a wounded man. On another occasion two men out hunting were pursued by twenty or twenty-five Indians: one of them was killed, but the other took shelter in a little gulch and commenced pouring in his fire from the magazine rifle, and after killing and wounding four Indians and two horses, the rest galloped away, when he pursued his way to the command unmolested. The Indian bow is more deadly within range than any non-repeating rifle, as they can handle their arrows rapidly enough to keep from five to seven in the air following one another at once, with an almost unerring aim. But the Spencer rifle is too much for the bow, from its equal rapidity and longer range; and too much for the archer likewise, as yet, for the Indians have been seen to pick up the rifles of men they had killed, load them by the muzzles, and after many ineffectual attempts to fire them, throw them away.

The Cere Viaduct.

This fine structure, crossing the valley of the Cere and carrying the Paris and Orleans railway at a hight of 181½ feet from the water, is another and more complex and lofty specimen of the modern style of bridges supported on tubular piers. Each of these consists of eight cast iron columns, grouped in an ellipse, united by cross bracing, and resting on a base of brickwork. The piers taper upward from a base of about 8x16 feet, at the rate of 1 in 30 toward the major axis and 1 in 15 toward the minor axis of the ellipse. Their hights, we are unable to state precisely, but the highest cannot be far from 150 feet. There are five spans of lattice girders, the three central spans being 164 feet each, and the end spans 145 and 139. The abutments are of stone. The erection of this viaduct was conducted in the same bold manner as that adopted at Fribourg, the girders being first put together on the abutments, and then pushed forward until the overhanging ends were over the brickwork base of the first of the iron piers to be erected. They were then braced, and used as the jib of a crane for hoisting into place the successive joints of the tall iron limbs upon which they were to rest. When one of the piers was thus completed, the girders were again pushed forward until the foremost end rested on it and projected forward over the base of the second pier, and the same process as before was repeated until the structure was complete. The total cost was about $150,000.

IODIDE OF SILVER possesses the singular property of contracting by heat and expanding by its withdrawal.

Editorial Summary.

A SUBTERRANEAN WATER SPOUT.—A remarkable irruption of water took place recently in the Cole silver mine, Virginia city, Nevada. The tunnel is a little over 1600 feet in length and perfectly straight. Several successive outbursts of water have rushed through the tunnel, the last filling it up with rock for a distance of nearly 100 feet. At the last accounts, this had been cleared out by the workmen except about ten feet, and but little loose rock was then coming in; although a large stream of water, about thirty-five inches, was still rushing over and through the pile of loose rock obstructing the tunnel, with a loud roar, occasionally accumulating its force and thrusting the mass partially forward. A large cavern must have been formed at the head of the tunnel, as hundreds of tuns of rock have come from it; but it has not yet been explored. A curious effect is noticed from throwing in the daylight to the head of this straight tunnel by means of a properly placed mirror at the mouth. Persons at the further end are plainly distinguishable and whether dressed in black, blue or any other color, appear as white as snow—a ghostly sight.

MODERN GEMS.—The progress of human skill in the imitation of precious stones, and the gradual giving-out of the diamond mines of Golconda and India, have rendered spurious gems more abundant and more perfect in imitation than ever. Even expert connoisseurs are said to be sometimes deceived by certain classes of imitation gems; and so far as this is the case, the advantage of the genuine stones over the spurious in a merely ornamental point of view, has certainly been reduced to a very fine shade. A recent work on the subject states that but a small proportion of the gems now sold and worn are genuine, and that large quantities are made in Birmingham and Paris, sent to India, and sold by the natives to strangers as "gems from the mine." The steady progress of science in the re-composition of natural products leaves little room to doubt that man will eventually conquer this field also from nature and occupy it with more exquisite products of art.

SILVER MICA.—Puscher, of Nurnberg, has adapted mica very beautifully for decorative work, such as inlaying and metal-coloring. After purifying it by treating in thin sheets with a strong solution of sulphuric acid, it is silvered exactly like a looking glass, and appears like a most brilliant film of metal. The ease with which it is cut in shapes and laid superficially, together with the splendor of its appearance, may be imagined. For a dead silver white, it is heated to redness in a clay muffle—after cutting into the shapes required—when it loses most of its flexibility, and becomes white, but in single sheets remains partially transparent and flecked with gray spots. The latter, with the transparency, disappear when two or three pieces are laid together. Small fragments of it, or finely ground, may be sprinkled upon a freshly poured sheet or coating of gelatine, and then fixed by a varnish, with beautiful effect.

VELOCITY OF STEAM AND OTHER GASES.—Mr. R. D. Napier has demonstrated to his own satisfaction and that of others first theoretically and afterward by experiment, that the velocity at which steam will flow from a boiler through an orifice into a vacuum, is rather less than half of that given in all published tables, and that it is no greater into a perfect or partial vacuum (at a pressure of two or more atmospheres) than into the air. The general law is established, that a gas of any given pressure will rush into a gas of not more than half that pressure, at the same rate as into a vacuum.

BERNABÉ'S IRON COPPERING.—Admiral Viscount de Cha' bannes, at Toulon, writes in a published letter that not only is the adhesion of the iron and copper by M. Bernabé's process as employed in the arsenal of Toulon, so perfect that they are not started apart by hammering, bending or breaking, but that if a hole in the copper at any time occurs from abrasion, the part can be re-coppered on the spot, as effectively as before. If this means that a repair of this kind can be effected on a ship's bottom, the method may very well have all the value attributed to it.

THE HYDRAULIC PROPELLER.—We observe that Admiral Elliott, in a paper read before the Institution of Naval Architects, has come out very strongly in favor of the "Waterwitch" principle as the future motive power for ships of war. He was as strongly sustained in the ensuing discussion by Sir Edward Belcher, and warmly encouraged by Mr. Scott Russell while Mr. Reed, Chief Constructor of the Navy, and others, opposed. Mr. Russell predicted that with time and perseverance the plan would certainly succeed in the end, and supersede the screw for the purposes of warfare.

THE IMPROVEMENT OF THE RHONE is prosecuted vigorously by the French Government. At nine points the river has been or is now being straightened, widened or deepened as the case required, so as render navigation safe and unimpeded. All efforts to improve the natural channel at the mouth having failed, a canal two miles long has been cut for an outlet to the sea; issuing from the river by a lock 500 feet long and 70 feet wide, and discharging into an open dock formed by two piers, each three quarters of a mile long.

MISCELLANEOUS.—Iron at an intense red heat is transparent to a slight depth.——The British Government have awarded Major Palliser $50,000 for his improvement in projectiles and propose to ask half as much more for him in their next year's estimates.

INGENIOUS LIGHT DRAFT STEAMERS.—A late paper by J. R. Napier explains the construction of some steam tugs and barges now building at Glasgow for the Godavery river (India) of a length of some 140 feet by 25 feet wide, and only one foot draft. The bottoms are made of galvanized cast steel plates only one eighth of an inch thick, fastened to longitudinal frames two feet apart. To stiffen a hull so long, light and shallow, the awning necessary under the tropical sun and rains, is made of galvanized one sixteenth inch steel plates, on frames similar to the bottom, but lighter and closer, and is made virtually a part of the hull, being connected with the vessel's bottom by two steel lattice frames placed about two thirds of the width of the vessel apart, and the whole structure is stiffened laterally by steel angle bars and diagonal braces. The propeller being at the stern, the boiler and fuel are placed in the forepart of the vessel to balance it. The engines consist of a pair of 11 inch cylinders with 4 feet stroke, supplied with steam at 150 lbs. pressure by a boiler nearly like that of a locomotive. The paddle arms are of wood, of a radius of 3½ feet, and have no rims or floats. Except a short forward deck for a steam capstan, warping pulleys and anchors for getting off sand banks, they are open boats, with a light floor of wood laid on the bottom frames. With 2½ feet of freeboard and 1 foot draft, their depth will be about 3½ feet.

CONCERNING SOUND.—The transmission of sound through solid metallic tubes is so perfect that conversation has been maintained in a low tone between the ends of one of the Paris water pipes 3,120 feet long. The velocity of the transmission of sound is greater, by four to sixteen times, in metals than in air, and in wood, as computed by Chladni, from ten to sixteen times greater; which is not so commonly known. Rock conveys sound so much faster than air that the ear applied to a stratum of rock in which blasting is being done at a distance, will perceive two distinct reports; that conveyed through the rock first, and afterward the ordinary report through the atmosphere. It has been found that the velocity is also proportioned to the loudness of the report, other things being equal. With 2,000 pounds of powder a report travelled 967 feet in a second; with 12,000 pounds, 1,210. The most notable observation lately made in the direction of reducing sound to form and measure, is the refraction of it by M. Sondhaus, by means of accoustic lenses made of spherical collodion envelopes filled with carbonic acid

THE BOXER SHRAPNEL SHELL.—Shrapnel is a spherical shell filled with powder and bullets. In the old kind the powder and bullets are mingled: the improved segment shell adopted in 1859, separates them, obviating the tendency to burst in or near the gun from the mutual collision of the contents on beng discharged. The Boxer scrapnel is a cylindrical iron case with the powder in a chamber at its base, where the walls are thick, and some 450 iron bullets in the forward part; thus resembling substantially a loaded cannon in itself. A trial was made at Shoeburyness, April 26th, to test the comparative effects of the improved shrapnel of 1859 and Colonel Boxer's invention. Three targets were placed one behind another, that in front presenting a surface of 9x54 feet. The Boxer, fired from a 9-inch gun with 30 lbs of powder, sent 142 balls through the front target, 46 of these through and 60 into the second target, and 26 of the latter through and 6 into the third target.

GUN COTTON has now taken a well-defined place in commerce and utility, and its manufacture has been so far perfected that its definite quality is as certain a result as that of gunpowder, its liability to spontaneous explosion has been obviated and, the rapidity of its combustion can be accurately regulated, It owes its present position to the combined exertions of three parties: Major Von Lenk, of the Austrian army, Mr. Abel, of Woolwich, Eng., and Messrs. Prentice, of Stow Market. The spontaneous chemical changes which have led to disastrous explosions, are characteristic of lower compounds, a very small percentage of which is liable to form under certain conditions in the tri-nitro-cellulose which constitutes the most perfect form of gun cotton. This is now prevented by Mr. Abel, by adding a little carbonate of soda which neutralizes the first result of change, consisting of a little nitrous acid, and all further decomposition is thus obviated.

DAW'S METALLIC CARTRIDGE—specially designed for breech-loading rifles—is cased in thin rolled brass, formed around a mandrel with two turns, the end cemented down, the base united with a metallic cover, and the whole made completely impervious to water. This cartridge is extolled in the English journals as the best, surest, cleanest, lightest and cheapest yet made.

A WELL-VENTILATED MEASURE.—The English journals inform us that on the night the reform bill was introduced, 1,500,000 cubic feet of air, comfortably warmed, passed through the House of Commons every hour. Fifteen miles of steam pipes are used in warming the two Houses.

BUSINESS AND MANUFACTURING ITEMS.

COTTON.—A French stocking machine now on exhibition is made to notify its attendant of the breaking of a thread by a very simple arrangement; each thread sustaining a small steel lever which drops when the thread is broken, so as to complete an electrical circuit and cause the striking of a bell.

IRON.—The reported failure of the Paris Bessemer steel bridge is denied emphatically. The apparent deflection of the center (which is a straight line) was an optical illusion.——Mr. J. Campbell Evans, of the Morden Iron Works, East Greenwich, Eng., has made a machine which rolls screws by means of three circular dies, set with the proper pitch, in such a manner as to rotate the red-hot bolt between them and shape the thread by their edges.

MINING.—The cost of English coal in human life in five years was, from 1856 to 1860, 5,089 lives for 381,000,000 tuns; from 1861 to 1865, 4,627 lives for 468,500,000 tuns.——Iridium is said to be among the minerals found in connection with gold in the Richardson Mine at Madoc, C. W. It is also found at Chaudière, together with platinum. It is a rare and valuable metal, of extreme hardness, and is in demand for pointing gold pens.——The falling off in the Australian gold fields has prompted the authorities of Queensland to stimulate new discovery by offering a reward of $15,000 for the discovery of any new gold field not less than 20 miles distant from any other already proclaimed within the colony.

RAILROADS.—It is proposed to consolidate the St. Louis and Iron Mountain Railroad, which runs southward from St. Louis through the great metalliferous region of southeast Missouri, with the Cairo and Fulton, which is designed to run from a junction with the former road to Cairo (30 miles from Cairo west having been heretofore completed), and thence to be extended southward to Belmont, opposite Columbus, Ky., which is the terminus of the Mobile and Ohio road. Some 100 miles of the line are yet to be built, though partly graded. St. Louis will thus get a direct connection with the whole southern system of railroads, and a route to New Orleans 700 miles long, or 500 miles shorter than by the river. So says the *Railroad Journal*.—Further particulars of Robertson's (Nevada) track-laying machine—pronounced in San Francisco a complete success—show the motory arrangements more clearly than we were enabled to obtain them from an imperfect newspaper report, a few weeks since. The leading necessity, a road for the machine that makes the road, is provided by placing the levelling, tie-laying and track-laying machinery forward of the trucks, on a projecting portion of the frame, forty feet long. The whole frame, 60 feet long, resembles the skeleton of a lattice bridge, and rests by its last 20 feet on low car trucks, over which are placed the engine and boiler, and the load of ties and rails. The latter are passed over the machinery as fast as wanted by endless chains and overhead travelling cranes, and laid as heretofore described, forming the track upon which the machine moves forward, while a tender train brings up the fresh materials without interruption of the work. It requires only 20 men, and lays track at the rate of six to twelve miles a day.—The Mont Cenis tunnel having passed through the quartz and entered upon a softer stratum, now proceeds much more rapidly. It is now more than half done, 4·129 miles having been tunnelled, leaving 3·461 miles yet to be bored.—The Russian Government is making surveys for great lines uniting the Baltic to the Black and Caspian Seas.—It is stated that a line of steamships is to be established between Hamburg and Aspinwall, commencing with monthly trips. Direct emigration to the Pacific coast, as well as direct trade, from Germany, may probably be stimulated by such an enterprise.—A first-class carriage on the Great Northern Railway (Eng.) caught fire on the 26th of April last, when at full speed, and burned for fully ten minutes, until it became wrapped in flames, before the distressing situation of the passengers was discovered by the guard. Their signals, shouts and shrieks (a number were ladies) were of no avail whatever. Where were the rockets?

MISCELLANEOUS.—A commission appointed by the legislature of Maine is engaged in investigating the problem of restoring and preserving the fish, which have disappeared from the streams to a great extent in consequence of the erection of dams and manufacturing establishments.—Brown coal, or lignite, has been found in considerable beds in Middlesex county, New Jersey, between Keyport and South Amboy. The proximity of this coal to the city of New York, where it is calculated that it can be delivered at a cost of not over $2 a tun, will render the beds very valuable property, even if the coal is none of the best.—The Boston Fruit Preserving Company freeze fish solid in their establishment in a few minutes, and preserve them for an indefinite period. It is supposed that a large trade will be done in frozen and preserved fish. It is proposed to pack salmon in this way in the summer, when they are cheap, for winter sale.—A Los Angeles, Cal., olive-grower sold last year from seventy trees, occupying about 1½ acres of land, 2,800 gallons of oil for $1,400.—Coral for jewelry is said to have risen in value within five or six years from five dollars an ounce to one hundred; five or six times its weight in gold.—The *Caledonian Mercury*, established in 1662, and which claimed to be the oldest newspaper in Great Britain, on the 20th of April ceased to be published, after an existence of more than two centuries.—Coal is hereafter to be used exclusively as fuel on the New York and Erie Railroad, and the company have commenced selling off the wood they have on hand.—The New York City Railroads conveyed in 1866 nearly a hundred millions of passengers (93,907,682): an increase of over twelve millions from the previous year.—A shoal of from 150 to 200 bottle-nosed whales visited Musselburgh Bay, Scotland, on the 20th of April last, and were attacked by the Frith of Forth fishermen. After an exciting and protracted battle, witnessed by hundreds of spectators, 25 of the whales were brought ashore, measuring from 9 to 25½ feet in length.—A rich lode of bismuth has been discovered in South Australia, 200 miles in the interior. The product of the mine has commenced arriving in England.—The Franco-American Telegraph bill has been approved by the Governor of New York, and a certified copy has been dispatched to France where the Imperial Government, it is said, is ready to promote the enterprise in the most substantial way. The grantees are required to have the line in operation in two years; which is rather short notice.—It is said that a million of dollars annually made by the sale of Florida cedar wood for lead pencils.

Science Familiarly Illustrated.

What Is Petroleum?

The crude petroleum of Pennsylvania always issues up out of the earth mixed with inflammable gas. This gas makes an excellent fuel, and is much used for generating steam for the pumping engines. It is abundant enough to run all the engines in the oil district.

If the gas as it issues out of the wells be subjected to pressure or to a temperature of zero, a considerable percentage of it will be condensed into a liquid, the amount condensed being somewhat proportioned to the pressure and cold. Some of it, however, refuses to condense at any pressure and cold which we can command, and such is consequently a permanent gas. That which condenses assumes the form of gas again as soon as the pressure is removed and it is exposed to ordinary temperatures. The change into gas or vapor is very rapid and violent, and in fact is a case of boiling. Some of the volatile liquids will boil on ice!

It is evident from these statements that petroleum gas is in fact a mixture of several gases and vapors, which may be separated from each other by careful management of pressure and cold.

We may likewise demonstrate the fact that the liquid crude petroleum is a mixture of different liquids. The partial separation of these may readily be effected by distillation. The oil which first appears on distillation is very light in gravity and has a low boiling point. As the distillation progresses the gravity and boiling point increase with remarkable regularity; from the beginning to the end there appears to be a constant and regular progression.

The reader is now prepared to apprehend the fact that petroleum is composed of a *series* of substances having properties which differ from each other only in degree. There is a beginning and an end, or top and bottom of the series, and between them regular gradations of intermediates. The beginning or top of the series is a permanent gas; the bottom or end is a solid. Between these are gradations of consistency, gravity, and volatility.

In an arithmetical or geometrical series there is always a peculiar difference between consecutive members of the series: given one member of the series and that peculiar difference, and the whole series may be determined, or any particular member of it. Is there any such certain and interesting relation between the members of the petroleum series?

The only chemical elements which enter into petroleum are carbon (C) and hydrogen (H). (Water, sulphur, nitrogen, compounds, etc., which are often found in crude petroleum are properly regarded as foreign substances.) Now it is evident that the members of the series must differ by varying proportions of these elements—there must be progressive increase of one over the other.

The beginning of the series has been found to be composed of two atoms of carbon (C_2) with four atoms of hydrogen (H_4); the beginning of the series is represented thus—$C_2 H_4$. Now it happens that this substance $C_2 H_4$ to chemists is a familiar acquaintance. It is commonly known under the name of *marsh gas*, and is known to coal miners as fire damp. The second member of the series is $C_4 H_6$, and the third is $C_6 H_8$. The reader hardly needs to be told that the fourth is $C_8 H_{10}$, and he is able to determine the twentieth. The common difference of the series is $C_2 H_2$, and the general formula for the series is $C_n + H_{n+2}$.

We append a table showing the specific gravity and boiling point of a part of the series. The first four are gaseous at ordinary temperatures, and the specific gravities are given in comparison with air:—

		Specific gravity.	Boiling point.
1	$C_2 H_4$	0·554	..
2	$C_4 H_6$	1·04	..
3	$C_6 H_8$	1·52	..
4	$C_8 H_{10}$	2·01	32°
5	$C_{10} H_{12}$	·628	86°
6	$C_{12} H_{14}$	·669	158°
7	$C_{14} H_{16}$	·699	198°
8	$C_{16} H_{18}$	·726	243°
9	$C_{18} H_{20}$	·747	278°
10	$C_{20} H_{22}$	·757	321°
11	$C_{22} H_{24}$	·766	359°
12	$C_{24} H_{26}$	·766	408°
13	$C_{26} H_{28}$	·792	423°
14	$C_{28} H_{30}$	·800	460°
15	$C_{30} H_{32}$	..	496°
16	$C_{32} H_{34}$	..	527°
17	$C_{34} H_{36}$	·825	..
25	Paraffine	·870	..

A National Survey.

The survey ordered by Congress, under the direction of the Secretary of War, of a belt of land extending from the Rocky Mountains to the Sierra Nevada, on the route of the Central Pacific Railroad, will probably be commenced by the first of July. The exploring party, to which we have already referred, headed by Mr. Clarence King, who has had several years experience as a mountain explorer, in connection with the State Geological Survey of California, has already started for the Pacific Coast. Among the nine assistants, as we learn from the *Nation*, are Mr. James T. Gardner, who has lately been engaged with Mr. King in surveying and mapping the Yo Semite Valley and the adjacent mountain region, as first assistant in topography, and Professor James D. Hague of the Massachusetts Institute of Technology, likewise an experienced traveler, as first assistant in geology. There are also two other topographers, two other geologists, and a zoölogist, a botanist and a photographer. On their arrival in California, a squad of twenty-three mounted Californians, under non-commissioned officers, will be detailed as a military escort, and with six drivers and packers will make up a party of thirty-nine.

The proposed line of exploration extends about 1,000 miles, by 100 broad, from Pyramid Lake, near Virginia City, on the eastern slope of the Sierra Nevada, to Denver City, on the eastern slope of the Rocky Mountains. The party hope to go this year, as far as Fort Riley, and spend the winter in the neighborhood of Virginia City. Next year they hope to reach Salt Lake City, and their work out of doors is to be completed in the third year.

BROWN'S FRUIT GATHERER.

In picking fruit trees the danger of climbing and of ascending ladders detracts much from the pleasure. To be sure "when the pear is ripe it will fall into our hands," if our hands are in the proper position. But in the engraving is shown a very simple fruit gatherer by which one may stand on *terra firma* and exploiter the denizens of the orchard. It is merely a bag for the reception of the fruit secured to a pivoted frame of wire, which when the cord is pulled, closes against the edge of a curved plate. The operator holds the staff to which the apparatus is fixed, in one hand and pulls the cord which operates it, with the other

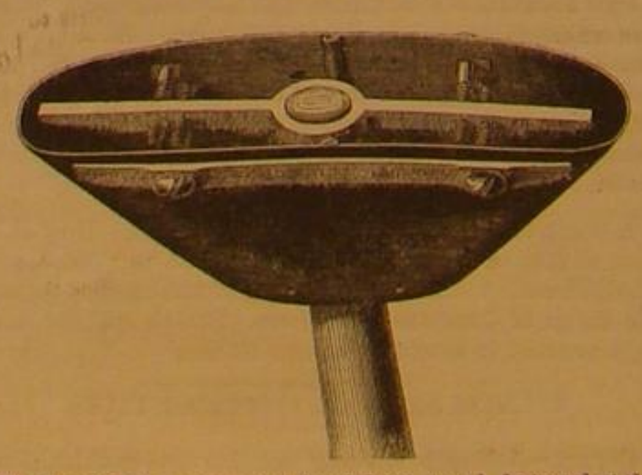


Placing the aperture so as to envelop the fruit, he merely pulls the cord, when the fruit is separated from the branch and drops in the bag. For the picking of fruit designed to keep, much care is required, and those which fall to the ground by the force of the wind or the violent shaking of the tree are almost always more or less injured. In raising fruit for market these injuries are elements of deterioration, and the fruit, whether apples, pears, peaches, or high growing and lasting fruits, should be presented to purchasers in the best possible state.

To secure these results is the design of the inventor, Mr. Wm. Brown, who patented his invention Feb. 5, 1867, and may be addressed at Box 1,021, Worcester, Mass.

TAYLOR AND LAFFERTY'S BROOM HEAD.

Metallic heads by which the broom corn can be attached to the handle are coming into common use. They are economical, although costing somewhat more in the first instance than the common brooms, because the handle and head need not be thrown aside soon as the corn is worn to stubs, but by a simple replacement of the comparatively cheap fiber the worn-out implement becomes again a broom.



The head in the engraving is of sheet metal, fastened at the top to a block through which is a hole for the reception of the handle. The handle tapers to the end, which is received in the socket of the yoke, through which pass two screws on each side of the handle, having on the outside of the case two metal braces for stiffening the box. The broom is introduced into the head, the butts being placed on each side of the central bar or yoke, until the head is filled, while the screws are slacked. These are then screwed up and by compression hold the broom very securely. It makes a light and handy implement.

A patent for this device was issued Sept. 11, 1865, to J. Taylor and R. M. Lafferty. For other information relative to it address J. E. Prutzman & Co., Three Rivers, Mich.

Exposition Notes.

THE LOCOMOTIVE GOLD MEDAL.—A letter in the *Boston Journal* gives the following circumstance connected with the award of the gold medal to the Paterson engine "America:" The Austrian and French members of the jury took exception to the "America" because it was so light in some of its parts. But fortunately the English member of the jury is well informed on locomotive engines and American engineering, and he explained that the railroads in America are of an entirely different construction from European roads; that the country is new, and the roads cheaply built, and the ties are subject to displacement from frost; that to ride over rough roads there must be elasticity in the machinery; that American engineers had difficulties to contend with wholly unknown to Europeans; that, taking all things into consideration, the American locomotive was superior to any other in the exhibition. His arguments were so convincing that the other jurors gave way and awarded the gold medal to the "America." This is a great triumph, and it has been achieved through the intelligence and honesty of the English juror.

AMONG the models, Thomas Dunn, of Manchester, illustrates a mode of erecting a steel bridge, by weaving straight bars into a self-supporting structure progressing from the shore, without supports or scaffolding.

A PARIS firm exhibit a machine automatically cutting, jointing, punching, countersinking and finishing sixty brass hinges per minute from the sheet metal.—Another Paris machine cuts cylindrical lucifer matches, ready for dipping, at the rate of one or two boxes per second. It consists of a slide carrying a row of parallel cutting tubes, made of a solid piece of steel, oscillating very rapidly, and cutting a row of matches at each stroke from the surface of a block of the proper length. A series of cutters on the same slide multiply the production to any desired extent.

THE English Society of Arts have made a handsome appropriation, and appeal to the public for funds, to aid artizans to visit the Exposition: a portion of the allowance being payable on the reception and approval of a report upon some object exhibited relating to the art or craft of the workman. The Lords of the Committee on Education have also proposed an allowance of $25 toward the expenses of any master engaged in schools of science and art under their direction, who may wish to visit the Exposition, coupled with a condition similar to the above, and with the addition of prizes of $100, $75 and $50 respectively for the best three reports in each department (science and art).

T. LABAT, of Bordeaux, exhibits a patent slip for drawing a ship out of water, consisting of a cradle horizontal on its upper surface, whereon the ship rests and thus retains her natural position, but with the under side parallel to the incline of the ways on which the whole is drawn out of the water. It runs on wheels traveling ten pairs of rails, and is drawn out of water with its load by ten long screws.

THE French Government exhibits a model of a submarine torpedo boat, propelled with a screw by compressed air. The roof is recessed to receive a small boat with a water-tight deck and manholes in its deck and bottom, and there is also an intermediate chamber, with manholes, beneath the recess in which the boat rests and having a water-tight connection with the boat: so that ingress and egress for the crew of the submarine vessel are practicable in comparatively rough water.

THE "CARRÉ" FREEZING APPARATUS has been set up in the park, to supply ice for the restaurants. It consists of a sort of boiler, in which ammonia is volatilized by heat until it reaches a pressure of five or six hundred pounds to the square inch, and by its sudden emission produces intense cold.

AMONG the outside objects is a chime of forty-three fine bells, weighing from 40 to 5,000 lbs. each, made for the cathedral at Buffalo, N. Y. The tunes are played by a great organ barrel, 4½x6½ feet, and pierced for 6,000 pins, with which a great variety of airs can be set, the musical machine being actuated by a 2,500-lb. clock weight.

BREVAL'S TAN PRESS, which is on exhibition, is said to be capable of extracting instantaneously about 60 per cent of liquor from the bark, and of getting through with about 66 cubic feet of bark in an hour and a half, employing one horse-power.

A STEAM DRYING DRUM for cotton goods, by Turpin, of Rouen, is readily adapted to any width of cloths, from three to six quarters, and dries 600 yards per hour.

THE Industrial School of Tournay sends to the Exposition a pair of vertical engines, about 20 horse-power, the designs, patterns, castings, and the workmanship throughout, made by the boys of the school, who are from 16 to 20 years of age. It is felt that this visible illustration of itself gives a strong impulse to the idea of industrial schools in every country in Europe—we hope it will in America.

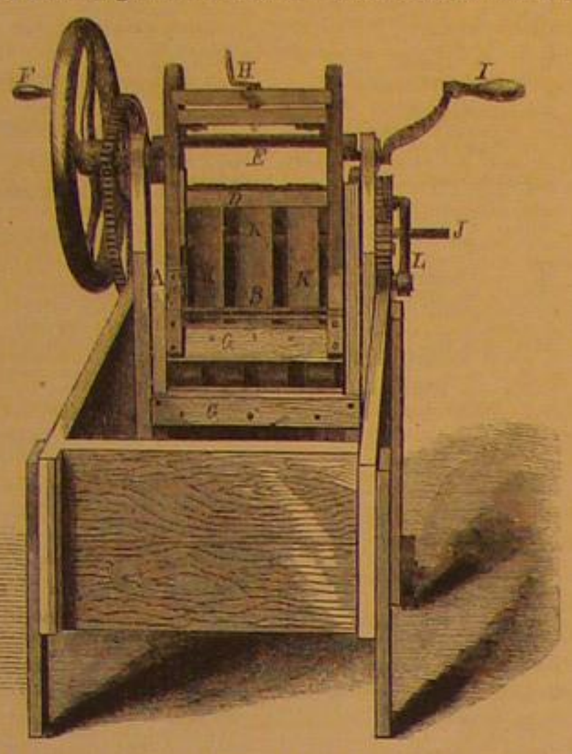
PARISIAN working hours are remarkably early—two or three hours earlier even than the English, it is said—and hence the day's work is done and the population are in the streets, gaily enjoying themselves, at an hour in the afternoon which in other countries is as busy and humdrum as any other in the day.

THE Lords of the Council on education have made arrangements for the conversion of the Museum of Irish Industry in Dublin into a College of Science. It will have ten professorships, seven of which already exist.

WHITE'S WASHING MACHINE.

The engraving is a perspective view of a machine which combines the operations of washing and wringing clothes, or which can be used for either of these purposes separately. It was patented through the Scientific American Patent Agency by Cassius A. White, of Fairfield, Vt., Feb. 26, 1867.

The apparatus is a rectangular box raised on legs to a hight convenient for operating, the front legs of which are furnished with castors or trucks by which it can be readily moved from place to place about the house, being wheeled in the manner of a barrow by means of pivoted handles at the rear end—not shown—which may be swung out of the way when the machine is in operation. Between upright standards forward of the center are hung two frames, the outer one, A, being pivoted to the uprights by a round bar, B, which serves also as a guide to the lower portion of the inner frame, C, in performing a vertical sliding motion, by means of slots in its side bars. The bar, D, is secured to the frame, C, and its projecting ends traverse in slots in the side bars of the frame, A. Two motions are given to both these frames by means of the crank shaft, E, which passes through a box in the ends of the cross bar near the top of the frame, C, and is driven by the fly wheel and crank, F; one is a reciprocating motion to the frame, C, and the other a swinging motion to both C and A. The lower cross bars, G, of the frames have faces of rubber, between which the clothes pass and by which they are cleansed from dissolved dirt. These faces of rubber are adjusted near together or apart by a screw, H, which depresses or raises the frame, C, on the shaft, E. These constitute the washing arrangements; but the washing frames may be driven by the crank, I, while the wheel, F, may be placed upon the driving shaft, J, of the wringing rollers, as desired.



These wringing rollers are of the ordinary construction, geared in the usual manner, and driven by the pinion attached to the fly wheel, F, through the medium of the large gear, which is attached to the upper roller. There is a device for passing the clothes as they are washed to the wringer by means of belts, K, which traverse through suitable guides over a series of upper and lower rollers, so arranged that the reciprocating motion of the washing frames delivers the clothes to the belts, by which they are passed between the wringing rollers. The motion of the rollers carrying the conveyor belts is assured by gears connected with the prime mover, F.

Although, from the description, the machine may appear complicated, it is in reality very simple, and there can be no straining or pulling of the clothes. When one portion of a piece needs more rubbing than another it can be done by adjusting the pressure on the rubbers or turning the crank, F, back and forth. The compression of the wringing rollers is regulated by the lever, L, which turns a shaft having a cam on each end to raise the boxes of the lower roller.

New Species of Swindling.

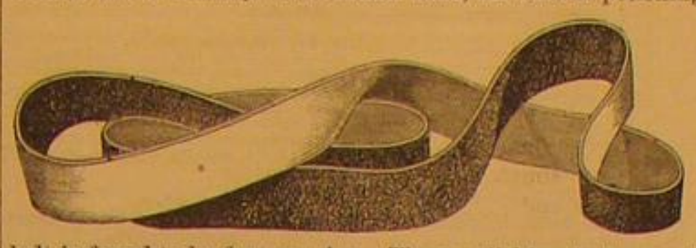
A new and successful kind of swindling has lately commenced, and been carried to such a profitable extent that a party of swindlers who have been brought to trial at Middletown, and Minisink, N. Y., had, as it is supposed, realized $150,000, twenty-five to thirty wagons, and from sixteen to twenty horses, before their arrest.

Proceeding to the country, the swindlers take different towns, and circulate among the farmers, to whom they offer patent rights of articles of ready sale. They represent the retail prices of such articles to be double or treble their cost to manufacture, and to show their confidence in the large profits that the farmers can make, they agree to sell the patent right for the note of the farmer, payable in one year, and that if he, the farmer, does not make profits, they will take back the right free of charge. If the farmer consents the swindler draws up the note, which the farmer signs, and in some cases, the swindler endorses the condition of payment upon its back.

When the parties separate, the swindler trims off the edges of the note with scissors, when the back separates from the front, the back having been neatly fastened to the front paper by mucilage upon the edges. Having thus rendered the note plainly negotiable, the swindler proceeds to the next farmer or merchant and gets it cashed, or gives it in payment for horses, carriages, wagons or other property, and then passes along to victimize another party. We hope the vagabonds will get their deserts.

ENDLESS RUBBER POLISHING BELT.

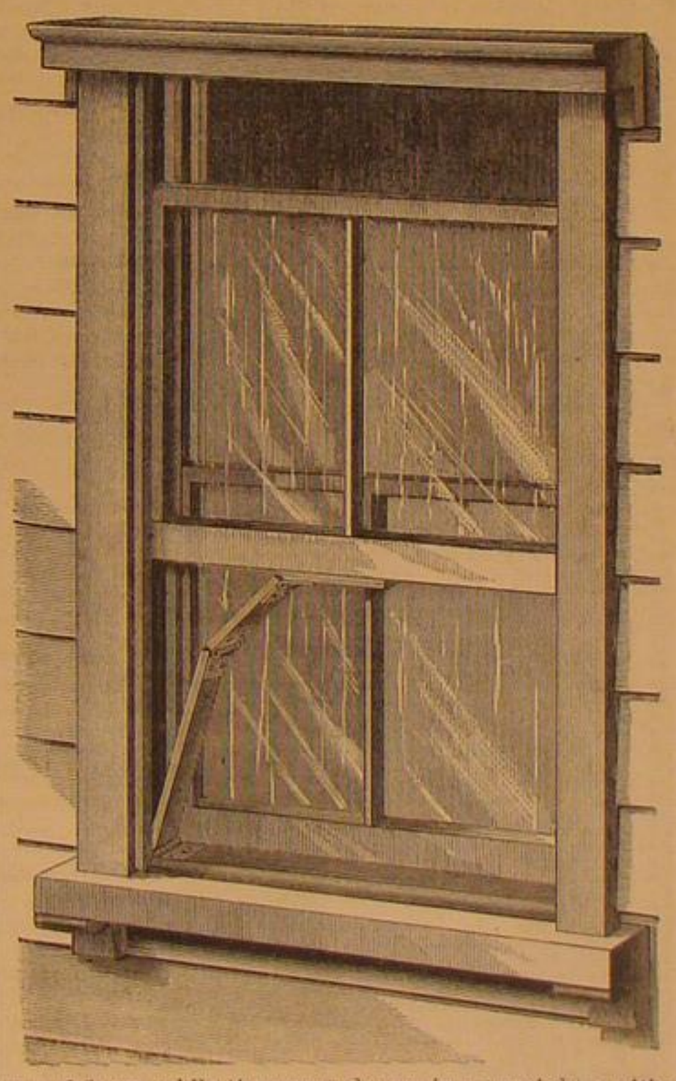
The emery or other polishing material is applied to this belt in the usual way. By the use of this belt a perfectly pliant and true surface is presented to act upon the work, which is so desirable and hard to secure in the use of leather belts. When much worn, it can be placed in water to soak off the old coating without injury, and by simply wiping the belt dry it will be ready to receive a new coating without the liability of the joints coming apart and without waiting for it to dry, as with leather belts. When compared in cost, efficiency, and durability with leather belts, the rubber polishing



belt is found to be far superior. These polishing belts are always perfectly flexible, pliant, and free from unevenness of surface. After repeated coatings of polishing material have been worn down and removed their unyielding property remains perfect, without perceptible change. By their use the work is better performed than by the use of the leather belts. Patented March 26, 1867. All communications should be addressed to Jeremy W. Bliss, No. 240 Main street, Hartford, Conn.

GRISWOLD'S SUPPORT FOR WINDOW SASHES.

The engraving shows a very simple device for holding the upper sash of a window in any position desired for ventilating a room. Springs and catches are more or less liable to become deranged, and weights, without some fastening, are temptations to children. The arrangement is a series of bars of differing lengths, hinged one to the other, and the lower one hinged to the window sill. These bars are of such a length, width, and thickness that when extended they fill the space in the window frame under the sash in which the sash slides. In the engraving the support is drawn out of the recess to show it, but in use only one or more of the sections are



turned down, while the remainder are in an upright position. When fully extended and in place, these bars are supports to the sash when closed, and when shut down on the sill the sash may be entirely lowered. One of these may be applied to each side of the window, each differing from the other in the lengths of the sections, thus giving a number of grades of hight to the sash. It is so cheaply and easily made and attached that where more elaborate and costly appliances are not readily attainable it will commend itself to all.

It was patented by Mrs. Ellen M. Griswold, Hagerstown, Md., January 22, 1867, who may be addressed for further information relative thereto.

[For the Scientific American.]

THE COST OF ELECTRIC LIGHT.

The time appears to be near at hand when the electric light will be used for a variety of purposes. It is worth our while to inquire as to its cost. The expense and inconvenience attendant upon the production of electricity upon a large scale has hitherto been an obstacle in the way of using the electric light, except for lecture rooms and a few other purposes. But the recent improvements in the construction of magneto-electric machines and thermo-electric batteries have put it in our power to command the services of this beautiful illuminating agent on any desirable scale of magnitude.

In order to examine the question of cost intelligently, let us refer both electrical and illuminating effects to the common measure of power, viz., the foot-pound per minute. The experiments of Mr. Julius Thomson, of Copenhagen, have shown that the power to maintain the light to that of a standard candle for one minute is equal to the raising of a weight not exceeding thirteen pounds, one foot high in that time. I have arrived at a similar result from a reduction of recorded experiments made by Müller, Ritchie, myself, and others. I am satisfied that, where an electric light of not less than eight hundred to one thousand candles is produced, under proper management, the power required will not greatly exceed 15 foot-pounds per minute per candle. For smaller amounts of light the power required will be greater.

Now let us inquire what amount of electricity is the equivalent of, or is represented by 15 foot-pounds per minute. If 100 feet of No. 18 pure copper wire be coiled into a helix and immersed in a pound of water, and if the ends of this wire be connected to the poles of one cell of the Grove battery (pint cup size as used in telegraphing), the temperature of the water will begin to rise at the rate of 1° F. in 9½ minutes, or 0·105° per minute. Now if the temperature of one pound of water be raised one degree (Fah.) per minute, this effect will be the thermal equivalent of 772 pounds raised one foot high in space per minute; the heating effect then, of our Grove cell upon the water is the equivalent of 0·105×772=81 (call it 80) foot-pounds per minute.

It is well known that a galvanic battery will perform its maximum work when the external resistance which it encounters is equal to the internal resistance of the battery. I have found the internal resistance of the pint cup Grove cell to be equal, on the average, to that of 100 feet of pure copper wire, No. 18 size. Hence the maximum external effect of the ordinary Grove cell may be set down as the equivalent of 80 foot-pounds per minute, equal to the production of 80÷15=5⅓ candle lights. I would not be understood as saying that this amount of light can be produced by a single Grove cell, but that 1,000 cells, if properly arranged, would be capable of evolving somewhat more then 5,000 candle lights from a single lamp.

With sulphuric acid costing 2½ cents, nitric acid 10 cents, zinc 8 cents, and mercury 50 cents per pound, the cost of running 1,000 Grove cells one hour, while doing their maximum work, would be $27.65. This would give for 5,000 candles a cost of about 5½ mills per hour per candle.

The cost of gas light per candle per hour would be about one mill, if gas costs $3.25 per thousand cubic feet, and if one cubic foot per hour gives the light of three candles.

With the Smee battery, carefully managed, the cost of 5,000 candle lights would be about the same as with gas.

Let us now look at the cost of electricity as developed by the magneto-electric machine. The power expended on the machine is consumed in friction, in heating the wires, magnets, etc. On a well built machine which I examined in 1861. 1,100 foot-pounds per minute were required to keep the machine in motion when the circuit was open, and the machine doing no work. But when the circuit was closed 3,200 foot-pounds per minute were required to maintain the same velocity of rotation; nearly all this excess of power (viz., 2,100 foot-pounds) was measured as electricity, about two thirds (say 1,300 foot-pounds) being expended internally, heating the coils and magnets, etc., and the balance, 800 foot-pounds, measured as external useful effect. Had the external resistance been larger, a greater proportion of the expended power would have appeared as useful effect. Suppose, however, that only 800 foot-pounds per minute could be utilized by this machine and used for illuminating purposes. This would be the equivalent of 800÷15=53·33 candles, and the total power required (including friction, etc.) would be 3,200÷53·33=60, about sixty foot-pounds per minute per candle.

In the vicinity of Boston, power is furnished, per horse-power, at the rate of $180 per year of 313 days of 10 hours each, or at the rate of $\frac{\$180}{313\times10}=\$0{\cdot}0575$ (5¾ cents) per hour. If only one fourth of this power could be utilized as light, $\frac{33{,}000}{4\times15}=550$ candles would be the equivalent of one horse-power, and would cost $0·0575÷550=$0·0001046, about one tenth of a mill per hour per candle, being about one tenth the cost of gas light.

Let us for a moment take another view of the matter. The average hourly consumption of coal by a good steam engine may be set down at four pounds per hour per horse-power,=(33,000×60)÷4=495,000 foot-pounds from one pound of coal. Utilizing as electricity, and thence light, one fourth part of this, we get 495,000÷4=123,750 foot-pounds, or as light, $\frac{123{,}750}{15\times60}=137{\cdot}5$ hour candle lights from one pound of coal, through the agency of the steam engine and the magneto-electric machine.

With the thermo-electric battery I have been able to develop 130,000 foot-pounds of electricity from one pound of coal$=\frac{130{,}000}{15\times60}=144{\cdot}4$—to about 144 candle lights.

There is still another point of view worthy our attention. Common gas coal will yield about ten thousand cubic feet of gas per ton. This, at three hour candle lights per cubic foot, would give (3×10,000)÷2,000=15 hour candle lights per pound of coal. About twenty-five cubic feet of illuminating gas weigh one pound. Hence one pound of gas, after it is made from the coal, will yield a light equal to that of a candle for seventy-five hours. One pound of pure carbon, wholly burned to carbonic acid gas, yields 14,500 units of heat, equal to 772×14,500=11,200,000, or 11⅕ millions of foot-pounds of work: hence, were the total energy of one pound of pure carbon converted into light, it would be equivalent to one candle light for the time of $\frac{11{,}200{,}000}{15\times365\times24\times3}=1\frac{5}{8}$ years, or one year and five months.

To recapitulate: the gas made from one pound of coal would yield a candle light for fifteen hours; one pound of the gas would yield a light equal to one candle for seventy-five hours; but could all the energy in a pound of carbon be converted into light, it would be equivalent to the burning of a candle for 12,410 hours.

Thus it will appear that by our ordinary methods of gas lighting we utilize much less than one per cent of the energy stored in the coal. I think we may reasonably expect that electricity, as developed by the thermo-electric battery, the magneto-electric machine, or some still more efficient apparatus, will help us in some way to bridge the chasm between fifteen and twelve thousand hour candle lights from a pound of coal.

MOSES G. FARMER.

Salem, Mass.

Correspondence.

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

"Wirbel-Bewegung."

MESSRS. EDITORS:—Are you aware that smoke rings are frequently produced during the firing of light and heavy ordnance, from smooth bore as well as from rifle cannon, and from 3-inch to 15-inch calibers? Sometimes they proceed from the vent, but I think the more beautiful ones are from the muzzle. They appear of a double character, a ring within a ring, and always remind me of the rings of Saturn. During the firing of the 8-inch rifle in April last at this post, one stormy day I observed a double smoke ring unravel itself from the clouds of smoke. It gradually ascended, moving with considerable velocity against a head wind in line of fire, and continued to rotate distinctly for several minutes, expanding by degrees and throwing off a stream of smoke from the outer edge. The space within the inner ring on this as on all occasions was free of smoke. Meantime the general smoke of discharge was blown quickly to the rear and over the ramparts, being a very unexpected sight. I called the attention of the Captain of Ordnance and of others to the fact, that the smoke rings on occasions moved against a head wind.

Prof. Nichol, author of the "Architecture of the Heavens," puts forth the theory that the gaseous heavenly bodies may throw off rings while in the nebulous state, being a result of the combined actions of contractions and rotations. He thinks the rings may break up and form satellites. He says, "were an elastic belt placed on a wheel and driven with great velocity, the belt would stretch and rotate by itself, and would continue so doing were it not for the earth's gravitations; but it appears now evident that rings of nebulæ may be formed under other conditions.

T. T.

Fortress Monroe, May 13, 1867.

Russian America.

For a distance of nearly 1,000 miles, says a writer in the New York *Times*, the whole coast is thickly studded with islands of all sorts and sizes. The inland waters formed by these islands are as calm and unruffled as a mill pond. In the summer season it is a paradise for those who have no other goal in view than to exist in a free, untrammeled atmosphere, skim tranquilly along the quiet waters in light canoes, and at night pitch their tents on the nearest island. There is always plenty of game to be found. Besides water fowl of every description, the larger islands mostly abound with elk, deer, black bear and grouse.

The main land presents a series of inlets and arms of the sea, running far into the heart of the lofty coast range. There is scarcely an acre of decent farming land to be seen; in fact, we may travel a long distance and not discover a spot level enough to build a good sized house on.

The Stiken River is the fourth in volume and size on the west coast of North America, ranking after the Columbia, the Colorado and the Frazer. It empties itself by three channels into the Pacific, 70 miles below Sitka, and in about 57 degrees north latitude. It took us four and a half days to ascend 170 miles, while in descending the same distance the vessel made the journey in less than sixteen hours. For the first hundred miles or so, the river is walled in by huge mountains with peculiarly sharp volcanic cones or peaks, rising one above the other and covered with snow. The scenery is of the grandest and most stupendous nature, and our little steamer, staggering and trembling against the swift current of the river, seemed a very cockle shell in the presence of these vast and silent creations of the Almighty. The most extraordinary natural feature that attracted our attention was a glacier or field of blue ice, about 40 miles up, on the north bank of the river. It is about 150 feet high on the river, and extends along the edge of the stream for eight miles, running back into a valley among the mountains as far as we could see. A cañon was finally reached, which baffled all attempts to pass through or around it, although several bold miners lost their lives before their companions gave up the hopeless effort to navigate the cañon in their canoes. A land journey of 100 miles failed to find any practicable approach to the river, which was left unexplored farther.

A GRINDSTONE should not be exposed to the weather, as it not only injures the woodwork, but the sun's rays harden the stone so much as, in time, to render it useless. Neither should it stand in the water in which it runs, as the part remaining in water softens so much that it wears unequally, and this is a very common cause of grindstones becoming "out of true."

THE income of McCormick, the noted patentee of the reaping machine, was last year, $169,760

LIFE-SAVING INVENTIONS.

The labors of the Commissioners are at last finished, the Board having adjourned on Friday, May 24. It will necessarily be several weeks, however, before their voluminous report will be ready for publication. Below we give our readers a full list of all the inventions presented for examination, kindly furnished us by the secretary of the board, Mr. W. A. Dunphy. This, we may remark, is the only complete list yet published:

1.	F. I. Latham	Sheet anchor.
2.	F. J. Speckman and S. Hand	Water gage.
3.	Levy Brothers	Fire extinguisher.
4.	Wm. N. Clark	Mode of hanging rudder.
5.	Wm. N. Clark	Water cask and life coat combined.
6.	W. P. Stensby	Mode of sealing boilers and tubes.
7.	W. A. Devon	Lowering, detaching and davits.
8.	Thos. L. Reed	Detaching apparatus.
9.	J. W. Bogart	Apparatus for unlashing boats.
10.	James Higbee	Improvement in steering apparatus.
11.	James Gregory	Gage cocks, water gages, etc., comb.
12.	James Gregory	Steam whistle.
13.	Peter Scofield	Steam gage.
14.	Daniel N. Beard	Self-unhooking eye bolt.
15.	Thos. J. Brown	Sleeping berth and life-boat combined.
16.	Clinton Roosevelt	Method of building vessels.
17.	Clinton RooseVelt	Method of anchoring vessels.
18.	N. Giroud	Steam gage.
19.	M. V. & S. C. Nobles	Detaching apparatus.
20.	John Mitchell	Detaching apparatus.
21.	E. Goulard	Hydrostatic unsubmersible vessel.
22.	Smith & Henis	Magnetic water gage.
23.	Smith & Henis	Jacket for same.
24.	A. Ricks	Steam steering apparatus.
25.	Bisbee & Co	Anti-incrustator.
26.	R. H. Dale	Regulator for propellers.
27.	S. Barms	Low water detector.
28.	Geo. W. Lamb	Metallic life buoy and life raft.
29.	C. W. Copeland	Locked valve.
30.	D. P. Davis	Pressure indicator.
31.	James E. Cole	Character of ocean water.
32.	M. T. Davidson & Co	Steam gage.
33.	C. G. Meinhardt	Life boat, lowering device, and mode of constructing vessels.
34.	J. F. Brown	Low water reporter.
35.	E. D. Taylor	Duplex slide valve.
36.	Wilson & Hauer (Louis Bauhoffer)	Life-saving mattrass.
37.	W. C. Marshall	Fire apparatus.
38.	C. F. Matorana	Depression of water.
39.	Thomas W. Roys	Life Barge.
40.	N. B. Allen	Detaching apparatus.
41.	James McMurchy	Safety valve.
42.	J. R. Vaughan	Life boat.
43.	Charles Rackett	Life preserver.
44.	J. Harrison	Boiler.
45.	Moore & McFarland	Detaching apparatus.
46.	Peterson & Gunner	Detaching apparatus.
47.	Peterson & Gunner	Self-furling Sails.
48.	Hargrave & Bibber	Detaching apparatus.
49.	J. J. McIntyre	Patent storm anchor.
50.	Carl Hennig	Propeller.
51.	George Hull	Detaching apparatus.
52.	John A. Olmstead	Life boat and trunk combined.
53.	J. W. Bogart	Patent car brake.
54.	George M. Allerton	Life boat and raft.
55.	George Henyston	Self-acting boat hook.
56.	Frank Marguard	Life preserver.
57.	Charles H. Hasker	Boat lowering and detaching app.
58.	Marcus Hanan	Boat detaching apparatus.
59.	Abraham G. Polhemus	Fire apparatus.
60.	N. McKay	Life saving tackle.
61.	Henry Hannen	Ship bed.
62.	R. F. Everson	Life boat.
63.	James Murtagh	Life raft.
64.	Wm. R. Black	Self-detaching hook.
65.	J. Hiles	Water gage and steam alarm.
66.	Philip S. Justice	Steam gage.
67.	Egbert P. Watson	Low water signal.
68.	John Ryder	Life raft and gutta percha bolster.
69.	N. Spencer Thomas	Anti-incrustator.
70.	S. G. Cabbell	Anti-incrustator, broom, and screw for cleaning boiler.
71.	S. G. Cabbell	Anti-incrustator.
72.	S. G. Cabbell	Marine atmospheric alarm signal.
73.	S. G. Cabbell	Door for ship's cabin.
74.	Fletcher & Harrison	Safety valves.
75.	John Zindorff	Safety valves.
76.	Richard Montgomery	Steam boiler.
77.	Joseph A. Miller	Anti-incrustator.
78.	George W. Brown	Patent roelock and thole pin.
79.	James Isted	Life raft.
80.	John W. Doughty	Syphon feed regulator.
81.	Boyd Elliott (Well's)	Automatic Boiler Feeder.
82.	James T. Horam	Safety valve.
83.	E. A. Turner	Steering apparatus.
84.	Carlish, Mason & Co	Locked safety valve.
85.	Carlish, Mason & Co	Detaching apparatus.
86.	Carlish, Mason & Co	Water gage.
87.	C. L. Frink	Water gage.
88.	C. L. Frink	Safety valve.
89.	H. N. Winans	Anti-incrustator.
90.	Worden, Rensford & Co	Syphon pump.
91.	S. Bickerstaff	Safety valve.
92.	S. Bickerstaff	Low pressure valve.
93.	G. H. Clemens	Detaching apparatus.
94.	S. B. Palmer	Low water alarm.
95.	E. R. Stillwell	Feed water purifyer.
96.	T. C. Banks	Alarm gage.
97.	G. H. Hart and E. Lumley	Patent rudder.
98.	S. B. Colt & Co	Steam gage heater.
99.	F. Fellingham	Detaching apparatus.
100.	John Ashcrott	Low water detector.
101.	James M. Miller	Heater and surface condenser.
102.	Wm. R. Bagley	Detaching apparatus.
103.	James S. Newell	Apparatus for cleaning boiler tubes.
104.	James S. Newell	Spring traveler.
105.	Brown & Level	Detaching apparatus.
106.	Wm. A. Lighthall	Surface condenser.
107.	Kubach & Clay	Fire alarm telegraph.
108.	Brown & Level	Detaching apparatus.
109.	G. G. Forshey	Steering apparatus.
110.	Julien M. Constantin	Patent lever for furling sails from deck.
111.	Edw. J. Monk	Detaching apparatus.
112.	Josiah Foster	Settee boats.
113.	John W. Hill	Safety valves.
114.	George Shone	Locked valves.
115.	George Shone	Hose coupling.
116.	Flowers, Patten & Co	Boat lowering and detaching apparatus
117.	Flowers, Patten & Co	Locked davits and cradle.
118.	Benedict, Torry, and Gurwibly	Combination hose.
119.	George T. Palmer	Patent floating (apparatus) anchor.
120.	Henry Mosley	Anti-incrustator.
121.	Henry Mosley	Detaching apparatus.
122.	George F. Palmer	Ship's windlass and pump gear.
123.	Lorenzo Fulton	Low water indicator.
124.	W. H. Low	Safety valve.
125.	James Marks	Self-riding life boat.
126.	William Moses	Detaching apparatus.
127.	J. W. Stiles	Water ejector.
128.	Farren, Traft, and Knight	Safety valve.
129.	John Ashcroft	Patent felt protector.
130.	Thomas Hanvey	Wood, etc., preserver.
131.	William P. Hunt	Steering apparatus.
132.	Lewis Youmans	Low water detector.
133.	Henry Mosley	Glass for cylinder for use of carbonic acid gas.
134.	Henry Mosley	Amalgamation of copper and cobalt.
135.	Snow and Hurlburt	Detaching apparatus.
136.	F. Fellingham	Life-preserving berth.
137.	B. F. Miller	Safety vessel.
138.	G. B. Massey	Detached apparatus.
139.	G. B. Massey	Leakage alarm gage.
140.	Osborn and Massey	Hose coupling.
141.	John J. Clyde	Movable life-preserving berth.
142.	M. W. Brown	Fire-proof paint.
143.	John Sutton	Direct-acting safety valve.
144.	H. L. Brevoor	Leakage indicator.
145.	E. H. Covel	Combination pump.
146.	W. M. Arnold	Steering gear.
147.	A. L. Shears	Self-baling life boat.
148.	William Porter	Self-acting pump.
149.	O. Warden	Signal light.
150.	J. D. Mason	Detaching apparatus.
151.	J. D. Mason	Life boat.
152.	J. D. Mason	Patent anchor.
153.	L. D. Ingoldsby	Mode of picking up boats at sea.
154.	L. D. Ingoldsby	Steering and manœuvring sail & steam vessels.
155.	B. Smith	Surf boat.
156.	B. Smith	Life boat.
157.	B. Smith	Ventilator.
158.	B. Smith	Steering apparatus.
159.	J. N. B. Bond	Steam boiler feeder and low water detector.
160.	J. N. B. Bond	Steam generator.
161.	Henry Dirges	Improved life boat.
162.	Henry Dirkes	Method of anchoring.
163.	D. Regester	Self-adjusting hook.
164.	H. D. Teuksburry	Hose coupling and pipe.
165.	Abraham Inslee	Safety valve.
166.	Marine Signal Company	Fog trumpet.
167.	Benjamin Sneden	Life boat, surf boat detaching apparatus
168.	Walter P. Burroughs	Boat detached apparatus.
169.	Bright O. Kirk	Blower.
170.	E. H. Ashcroft	Low water detector.
171.	G. A. Lilienthall	Telegraphic night signal.
172.	G. A. Lilienthall	Line rocket.
173.	John Wright	Life raft.
174.	James McDonough	Self-inflating raft
175.	James McDonough	Life boat.
176.	G. F. Darling	Detaching apparatus.
177.	Henry Matthews	Life-preserving seat.
178.	John Kennedy	Apparatus for laying-to in a gale.
179.	Henry Leofaft	Locked valve.
180.	R. Robinson	Locked valve.
181.	— Doyle	Detaching apparatus.
182.	Charles F. Brown	Patent anchor.
183.	John E. Cooper	Folding water anchor or drag.
184.	J. H. Holbrooke	Electric annunciator.
185.	E. A. Wood	Steam gage.
186.	Benjamin Smith	Improvement in constructing vessels.
187.	A. H. Colt	Patent granulated cork bedding.
188.	Charles C. Tealon	Double lock-up safety valves.
189.	R. W. and D. Davis	Patent boiler.
190.	Thomas Huntington	Boat detaching apparatus.
191.	Isaac Decker	Anti-incrustator.
192.	B. I. Kellum	Patent oar.
193.	W. Craig	Hose coupling.
194.	Wubert Banacliff	Improved life boat.
195.	Barbet McGinnis	Steam boiler.
196.	Henry McDonough	Life boat elevator.
197.	Charles Perley	Detaching block.
198.	Charles Perley	Hose coupling.
199.	John A. Fulton	Anti-incrustator.
200.	Joseph Wood & Co	Steam valve pump.
201.	Robert H. Griffith	Patent apparatus.
202.	Daniel Barnum	Air-pump attachment.
203.	N. H. Marston	Gage cock.
204.	W. C. Thompson	Life saving raft.
205.	John B. Holmes	High and low pressure boiler.
206.	F. E. Sickles	Steam steering apparatus.
207.	John Golding	Life-saving mattrass.
208.	Dr. Mannus Prister	Propeller steering apparatus (withd'n).
209.	C. C. Peck (H. O. Maynard)	Safety hook.
210.	James R. & Edward Dryburgh	Impt in steam chimneys of boilers.
211.	Lyman S. Fitch	Detaching apparatus.
212.	J. F. Culver	Steam generating apparatus.
213.	H. L. Stubbs	Temporary rudder.
214.	William Cutter	Detaching hook.
215.	John Shaffer	Safety valve.
216.	John Schaffer	Fusible alloy plug.
217.	Thomas Mitchell	Steam generator.
218.	Charles Magge	Anti-incrustator.
219.	Charles Magge	Low water alarm.
220.	A. Carr	Low water alarm detector.
221.	Henry Payne	To prevent collision of locomotives.
222.	L. and H. Raymond	Lock-up detaching apparatus.
223.	G. H. Wilson	Saterlee's patent davit block.
224.	Armstrong and Brown	Patent anchor.
225.	W. C. Dodge	Detaching apparatus.
226.	John Irlam	Engine piston.
227.	Geo. O. Evans	Low water detector and alarm.
228.	J. G. and J. Edge	Signal lights, rockets, and line rockets.
229.	Pollock and Van Wagenen	Detaching apparatus.
230.	Francis N. Gove	Steering apparatus.
231.	Alonso Temple	Anti-incrustator.
232.	E. Kellam	Detaching davit and cat block.
233.	Geo. W. Richardson	Safety valve.
234.	Chas. H. Baxter	Life preserving spar.
235.	R. B. Donaldson	Steam gage.
236.	Emile Roussell	Life preserver.
237.	J. H. A. Gericke	Turbinate force pump.
238.	Par, Fox & Robertson	Monitor and armor plated vessels.
239.	Henry H. Pember	Improvement in hanging rudder.
240.	J. S. Jackson	Detaching apparatus.
241.	Oliver Salgee	Hose coupling.
242.	S. Beckerstaff	Low water detector.
243.	J. B. Russell	Covington's steering apparatus.
244.	John R. Grace	Surf Boat
245.	T. C. Banks	Leak signal.
246.	James Cochrane	Pilots listening trumpet for fogs.
247.	Charles Dion	Fire alarm.
248.	Howard and Chase	Adjustable gage lock.
249.	J. N. McIntyre	Life raft.
250.	Daniel Clark	Fog signal.
251.	Charles F. Rusct	Improvt. in steam and other engines.
252.	Edward L. Brown & Co	Gage cock whistle.
253.	J. R. N. Owen	Spec. and draw'g elliptic rotary pump.
254.	G. Symmes	To equalize exp. and to generate steam.
255.	John A. Schulc	Improved motive power.
256.	John McKenzie	Self-acting pump.
257.	J. W. Fox	Bartlett's expelling pump.
258.	John A. Rollins	Improved steering apparatus.
259.	Tait and Avis	Improved steam boiler.
260.	E. B. Tannever & Co	Side lights.
261.	Frank D. Bingham	Surge reliever.
262.	E. Spencer	Steamboat wheel.
263.	Geo. Unit	Ice navigator.
264.	Mee and Jackson	Hose coupling.
265.	John A. Rollins	Shipping rudder.
266.	B. F. McAlhattan	Ship's bed.
267.	E. A. G. Roulstone	Life raft.
268.	Wm. Ayeres and Overton	Patent anchor.
269.	James Benson	Feathering paddle wheel.
270.	F. S. Schlesinger	Patent steering indicator.
271.	Elijah Williams	Boat propellor.
272.	Samuel B. Nowlan	Vertical cut-off steam safety valve.
273.	Samuel B. Nowlan	Geometrical steam mercury gage.
274.	Samuel B. Nowlan	Exhaust for sanitary ventilating ships.
275.	Samuel B. Nowlan	App. for gen'g steam without a boiler.
276.	Samuel B. Nowlan	Air cells to prevent found'g of ships.
277.	John Quigley	Flooding machine & fire extinguisher.
278.	P. H. Vander Weyde	Anti incrustator.
279.	S. S. Chandler	Lowering and detaching apparatus.
280.	Asahel Abbott	Repeating quadrant.
281.	John T. Ashley	Water-proof safe.
282.	F. E. Sickles	Model and tank for boat.
283.	John T. Ashley	Floating berth.
284.	Charles K. Parshall	Model of a safety valve
285.	D. F. Morseman	Power Governor.
286.	Philip Hoelzel	Improved steam generator.
287.	A. F. Crossman	Boat-lowering and hoisting apparatus.
288.	C. Williams	Life buoy.
289.	I. W. Reids	Improved tubular boiler.
290.	Alvin Walker	American submerged ship pump.
291.	R. Fletcher	Tidal alarm apparatus.
292.	Charles Hopkins	Larsdelle's double-suc'n steam siphon.
293.	R. Waddell	Hydraulic marine governor.
294.	W. Fitz James Thiers	Hydro'c ventilator & auto'c ship pump.
295.	A. T. Haves	Anti-incrustator.
296.	A. Arnold	Danger indicator
297.	John Sloan	Self-propelling life boat.
298.	C. H. Griffin	Automatic water inspector.
299.	Charles M. Cresson, M. D	Anti incrustator
300.	Bond, Turnbull & Co	Steam-boiler feeder.
301.	Edward Bradly	New mode of applying safety valves.
302.	Morgan Shepard	Lock-up safety valve.
303.	Henry T. Brown	Eubank's imp't. on steam engine.
304.	Dr. J. Bivant	Patent bushings, etc.
305.	William D. Andrews and Bro	Andrews' steam pump.
306.	John Golding	Fog signal.
307.	Edward Snell	Snell's patent anchor.
308.	Springer and Bartram	Boiler water gage.
309.	Charles Wing	Signal lamp.
310.	Thomas Silver	Marine steam-engine governor.
311.	Charles W. Copeland	Wire tiller rope.
312.	Norman L. Wheeler	Wheeler's boiler.
313.	A. C. Stimers	Frazee's life boat.
314.	R. H. Andrews	Single-acting force pump.
315.	Charles W. Copeland	Fusible plugs.
316.	Ray's (Woodward)	Ventilator & marine fire protect'n app.
317.	C. W. Walley	Life-preserving raft.
318.	J. F. Brown	Detaching apparatus.
319.	Jos. Humphries	Floating anchor and life preserver.
320.	W. C. Thompson	Life raft.
321.	Benj. Palmer	Comb. matt. and life-preserving float.
322.	Williams & Gee	Detaching apparatus.
323.	Edward O. Banks	Detaching block.
324.	A. Kauffman	Anti-incrustator.
325.	James Eccles	Water indicator.
326.	James Marks	Holmes' self-righting life boat.
327.	Richard Atwell	Plan to prevent incrustation.
328.	Laurence F. Frazee	Boat-lowering apparatus.
329.	L. Frazee	Boat-lowering apparatus.
330.	Esau Rowing	High-pressure boiler.
331.	A. C. Crondal	Cork matt. cushion, and life preserver.
332.	J. R. Taylor & Co	Brown & Harfield's windlass.
333.	C. Warden	Signal light.
334.	E. Buckman	Ship drag.
335.	Jno. H. Marr	Anti incrustator.
336.	A. Gilman	Shipping rudders at sea.
337.	Prof. Ogden Doremus	Exting'ng fire by liquid carbonic acid.
338.	John M. Sturgeon	Non-inflammable fluid.
339.	Keen Brothers	Steam gage.
340.	American steam-gage Co	Steam gage.
341.	J. A. Libbertz	Detaching apparatus.
342.	J. W. McKenzie	Water tank.
343.	Mr. Ryan	Wappich's rudder braces.
344.	Thomas A. Devyr	Method of constructing ships.
345.	Brown & Newman	Water expeller.
346.	Kenyon & Co	Steam steering apparatus.
347.	Capt. Franzen	Steering indicator.
348.	W. D. Andrews & Bro	Super-heating steam boiler.
349.	John Moody	Life boat.
350.	John Moody	Light ship.
351.	Mr. Raymond	Self-trimming patent wind sail.
352.	L. Raymond	Rowlock.
353.	P. Kennedy	Engineer's signal bell.
354.	R. F. Crane	N. W. Mfg Co's low water indicator.
355.	A. C. Boon	Wing life boat.

Recent American and Foreign Patents.

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

CONVERTING RECTILINEAR MOTION INTO ROTARY.—J. A. Ehle, Greenburgh, Wis.—This invention consists in operating a balanced lever or working beam with sliding carriages and hooks attached, upon polygons or triangles, so that the power shall be transmitted to a shaft in a continuous rotary motion.

WASHING MACHINE.—G. R. Hughes, Centralia, Miss.—This invention consists in constructing a washing machine somewhat upon the plan of the common pounding barrel, but still very unlike it and partly more efficient in its operation and appointment.

ADJUSTABLE ECCENTRIC.—J. B. Strickland, Scranton, Pa.—This improvement relates to the manner in which an eccentric is secured to the shaft or axle of the locomotive or other engine, and to the manner in which it may be changed to suit the lead of the engine valve.

BEDSTEAD.—Isaac Pedrick, Bridgeton, N. J.—This invention has for its object to furnish an improved bedstead so constructed and arranged that the weight upon the bed bottom may press against the shoulders or ends of the side and end rails; so that the posts may be detached without taking the bed bottom apart; and that the slats may be easily turned over for dusting.

CATCH FOR DOOR LOCKS.—G. W. DaCunha, New York City.—This invention consists in an improved catch or nosing for door locks formed with a flange to project along the jamb, and with a flange to project along the casing, the whole being cast solid in one piece.

ANIMAL TRAP.—J. W. Hollingsworth, Salem, Ind.—This invention has for its object to improve the construction of the animal trap patented by the same inventor and numbered 58,826, Oct. 16, 1866.

CAR COUPLING.—W. A. Stowell, Moretown, Vt.—This invention has for its object to furnish an improved car coupling, simple in construction and effective in operation, which shall be self coupling and which may be uncoupled without passing between the cars.

GATE.—Jacob Vail, Beloit, Wis.—This invention has for its object to furnish an improved gate strong, simple and durable, and which may be opened and closed by the driver without getting out of the vehicle.

DISINFECTING SEAT FOR PRIVIES, ETC.—Neil Clifford, A. N. Bell, Brooklyn, N. Y.—This invention consists in so combining with the seat of a privy, or other similar place, a receptacle for deodorizing or disinfecting, and in so connecting it with the said seat, that when such seat is used said deodorizing or disenfecting material will be thereby discharged into the vault below the seat.

STOVES.—A. Lee, St. Paul, Min.—This invention consists in an arrangement whereby the radiating surface of the stove is greatly increased, and fuel is economized.

CULLENDER BOILER.—B. F. Porter, Manchester, N. H.—My invention consists in combining with the common culinary boiler, the essential feature of the cullender or strainer, and also in dividing the space in the boiler by partitions which are removable at pleasure and also in providing means by which the cullender boiler may be used as a steamer.

RAKES.—J. M. Long, Hamilton, Ohio.—This invention has for its object to furnish an improved rake so constructed and arranged that the weight of the driver may cause the rake to act promptly when unloading, and so that when the rake teeth revolve up to unload, the shafts and the fingers may go down disengaging the rake teeth from the collected hay in much less time than can be done with other rakes.

SAFETY LAMP.—H. Weston, Towanda, Pa.—This invention has for its object the obviating of accidents which now occur in using lamps provided with kerosene, or other similar volatile hydro-carbons as a burning material. As the burning material is consumed the gradually enlarging space above it in the lamp becomes occupied by vapor or gas which is highly explosive, and which, if a loose wick be used in the burner, is very liable to be ignited by the flame, especially in blowing out the flame, which is frequently done after using the lamp, the wind driving the flame down around the loose wick into the body of the lamp. My invention has further for its object the prevention of the leakage of the burning material from the burner, which now occurs in a greater or less degree in using the ordinary lamps, and which runs down the sides of the same, soiling the hands when the lamps are grasped.

STRIPPING THE LEAVES FROM SORGHUM OR SUGAR CANE.—James A. Campbell, Kent, Ohio.—This invention relates to a new and improved machine for stripping leaves from sorghum and other sugar cane and also for depriving the stalks of their tops so that the cane will be fully prepared for the rolling or crushing mill.

MACHINE FOR RAKING, AND PITCHING OR LOADING HAY AND GRAIN.—Leopold De Laceé, Springfield, Ill.—This invention relates to a new and improved machine for raking and pitching hay and grain from the field as left by the mowing or reaping machine, and depositing the hay or grain upon wagons or carts, thereby enabling the farmer, with the aid of one or two men, to safely harvest and put under cover in a given time as much hay or grain as can be cut by two machines.

METHOD OF PREPARING AND PACKING OIL.—P. G. Finn, Erie, Pa.—This invention relates to a new and improved method of preparing and packing coal oil for transportation and storage.

BEEHIVE.—B. S. Haviland and E. H. Haviland, Fort Dodge, Iowa.—This invention relates to a new and improved bechive of that class in which a plurality of colonies are kept within a single box or house. The object of the invention is to afford a circulation of air through the several hives in the box or house so that the animal heat from all the bees will circulate freely through it, and in case of a weak colony being in the box or house it will receive a requisite amount of warmth from the others. The invention has also for its object the isolating of a hive from the others when necessary, in order that an empty hive may be cut off, so that those containing colonies may receive all the benefit of the animal heat, the circulation of the latter being confined to the inhabited hives.

DEVICE FOR ELEVATING ICE.—Henry Little, Middletown, N. Y.—This invention relates to a new and improved contrivance for elevating ice from the river, pond or lake where it is cut, into the ice house contiguous thereto.

BOX FOR HOLDING POWDER OR PULVERULENT SUBSTANCES.—George A. Moss, New York City.—This invention relates to a new and improved box for holding powder or pulverulent substances and is designed for putting up for sale those powders which are used, or applied for use, by sprinkling them from a perforated cover, such, for instance, as blue or indigo powder used in the laundry for clothes, the box in which the powder is put up and sold answering, by simply perforating the cover, to sprinkle or shower the powder from.

PORTABLE SEAT.—James F. Campbell and Cornelius Tinney, Williamsburgh, N. Y.—This portable seat is intended more particularly for use by drivers on street cars, and it is of such a construction that it can be readily applied and detached, and when applied adjusted to any position desired.

HOG HOLDER.—W. and C. Leffingwell, Clarksburgh, Ohio.—This invention relates to an improved hog holder for ringing, wiring or snouting, or for slaughtering hogs, and consists of an adjustable box capable of admitting one hog at a time, and of being adjusted to the size of the hog so that he cannot turn, and of holding his head fast in the position required, whereby the dangers and difficulties attendant on the present mode of handling hogs for the above purposes as well as the injurious effects thereof upon the hogs, are entirely obviated.

CAR COUPLING.—W. H. Mays, Hillsburgh, Nova Scotia.—This invention relates to a new and improved car coupling of that class which are commonly termed self-acting or self-coupling, and it consists of a draw hook attached to one draw head and a projection or ledge attached to the other draw head for the hook to catch over; the above parts being used in connection with a releasing or disengaging mechanism, whereby the coupling of two cars, when they come in contact, is rendered certain, and the ready disconnecting of the same, when necessary, effected.

LIME KILN.—George Atkins, Sharon, Pa.—This invention relates to an improved mode of constructing kilns for burning lime and consists in forming the bosh of the kiln in the shape of a truncated cone, based on an inverted cone, similar in its general conformation to that of a blast furnace, and provided with two tiers of furnaces which extend into the body of the kiln and open directly into the chamber, to throw the heat uniformly throughout the mass of limestone combined therein, and thus burn the lime better.

EQUATING SOLAR CHRONOMETER.—L. Mifflin, Germantown, Pa.—The object of the equating solar chronometer embraced in this invention is to exhibit the mean or clock time of day in lieu of the solar time.

PRUNING SHEARS.—Peter Keck, Zanesville, Ohio.—The nature of this invention consists of a combination of three levers to form a pruning shears whereof the cutting blade has a convex edge, the levers being so attached as to produce a drawing cut, and has for its objects increased facility in the use of the pruning shears, and the production of a clean cut.

COMPRESSION COCK.—Charles M. Alburger, Philadelphia, Pa.—This invention relates to an improvement in compression cocks or faucets and consists in raising the valve seat by forming it with a flange or bead around the edge to receive upon it a washer made of block tin or other suitable substance placed on the lower end of the spigot, in order to make them perfectly water and steam tight.

GAS APPARATUS.—B. L. Fetherolf, Tamaqua, Pa.—This apparatus is designed for generating illuminating gas from petroleum for family use, by applying a gas generator to an ordinary cook or heating stove, like a water back or fire brick lining, and thus by means of the fuel used for domestic purposes supplying the house with light as well as heat, and making a saving.

GANG PLOW.—James W. Sursa, San Leandro, Cal.—This invention relates to an improvement in gang plows, and consists in the arrangement of a device for raising and lowering the plows whereby they may be set at any required depth for working, or elevated above the ground to clear it entirely when the plow is moved from place to place.

ENVELOPE.—Ralph S. Jennings, New York City.—This invention relates to improvements in the construction of flat envelopes which are more particularly designed to be used for transmitting money and valuable documents safely by express and the mails.

CARRIAGE.—Francis Baker, New York City.—This invention relates to that class of carriages having low or half doors, and the invention consists in a novel arrangement of parts for supporting the glass or window frames therein.

HAY AND COTTON PRESS.—J. G. Roux, Raymond, Miss.—The novelty of this invention consists in two horizontal screws, located in a frame and connected to yielding levers, which are attached to the follower of the press in such a manner as to act powerfully on the said follower. These levers are acted upon by the screws in such a manner that when the greatest pressure is required, the levers are at a point where the screws have the greatest advantage and exert the most power.

TEASELING ATTACHMENT TO GIG MILLS.—Ernst Gessner, Aue, Saxony.—This invention relates to an attachment to gig mills, which is composed of a series of revolving disks covered with cards or other suitable material, which act in conjunction with adjustable guide rollers in such a manner that by the revolving motion of the disks and their position in relation to each other, the fiber of the cloth is acted on throughout the whole width of said cloth and under variable angles, and furthermore, the cards act uniformly and continuously on the surface of the cloth, thus raising the nap perfectly in a comparatively short time.

BOTTLE STOPPER.—Horace S. Carley, Cambridgeport, Mass.—This invention consists in securing the stopper to the neck of the bottle, in such a manner that it can, when drawn out of the neck, be swung out of line with the same without detaching it.

GRIND STONE.—Warren P. Miller, New York City.—This invention relates to a grind stone which is composed of a number of blocks of grinding material, which are placed and held upon a cast-iron or other metal disk, in such a manner that they form a ring of grinding material, the face and not the periphery of which is to be used for grinding saws and other metal articles.

HORSE-SHOE MACHINE.—John W. Kingsbury, New Bedford, Mass.—This invention relates to a machine for forming horse shoes from cold bar iron, the machine being so arranged as to be adjustable for all sizes of horse shoes, and so that one shoe is formed during each revolution of the horizontal and driving shaft of the machine.

DEVICE FOR HOLDING CIGARS.—Charles Appel, Hoboken, N. J.—The object of this invention is to construct an apparatus into which a burning cigar can be laid when the same is not to be smoked, and which can then be placed into the pocket without injury to the cigar and without burning the pocket. The device will be of great value to smokers when entering cars or ladies' rooms, or other places where smoking is prohibited; they can then put the burning cigar into my improved holder where it will be extinguished, and can be used again whenever desired.

TEMPORARY RUDDER.—H. L. Stibbs, Savannah, Ga.—This invention has for its object to furnish an improved temporary rudder, so constructed and arranged that should the vessel's rudder become lost or broken, it may be readily and quickly adjusted in place.

CAR COUPLING.—J. Smith and J. F. Irvin, La Porte, Ind.—This invention consists in providing for drawing the pin from the coupling link, when the cars are to be uncoupled, by a slide which has a cogged rack attached to it, and in a pinion on a horizontal shaft which works in the rack.

SEED SOWER.—Elijah U. Scoville, Manlius, N. Y.—This invention relates to seed sower, by which all sorts of seeds from the coarsest to the finest can be sown, and which can be adjusted for sowing any desired quantity at once, so that the seed can be spread thicker or thinner as may be desired. The invention consists chiefly in the use of a revolving roller, which is arranged longitudinally below the seed box. For the circumference of this roller are arranged longitudinal grooves, which receive the seed from the hoppers in the seed box, and distribute it upon or against a revolving, zig-zag, wire seive spreader, by which the seed is struck and spread evenly over the surface of the soil.

ADJUSTABLE SELF-SHARPENING PLOW POINTS.—Mr. H. G. Hall, of Putnam, Ohio, has just patented a new and valuable point for plowshares, which can be removed and replaced at pleasure. The point is of chilled iron, cast on a shank of wrought iron, which fits into a dove-tailed recess cored in the share. It can be reversed, so that when worn on one side the other side may be presented for service. His invention comprehends also adjustable edges, to be changed at will. The device seems to add greatly to the durability of a plow, while it does not materially increase its cost.

CARD HOLDER.—H. H. Pember, New York city.—This card-holder is intended more especially for travelling trunks.

SEWING-MACHINES.—Robert Barclay, Buffalo, N. Y.—This invention relates to a sewing-machine, the presser foot of which receives an oscillating motion simultaneously with the feed wheel in such a manner that a rectilinear even and sure feed is obtained. The oscillating motion of the presser foot is effected by a cam which acts on a spring dog which connects with the presser foot, and which is adjustable by a set screw in such a manner that the feed motion of the presser foot can be regulated to correspond to the motion of the feed wheel. Said cam is mounted on the end of the shaft which serves to produce the motion of the needle slide, and it acts in conjunction with an additional cam, which serves to impart a rising and falling motion to the take up mechanism, the object of which is to take up the slack of the needle thread as the needle descends, so as to prevent the formation of a loop on the top of the material to be sewed.

HORSE HAY FORK.—H. H. Hatheway, Clockville, N. Y.—The object of this invention is to so construct and arrange a hay fork that it will operate easily, and that the tines will be prevented from coming into contact with beams or other obstructions.

SEED PLANTER.—D. H. Hull, Plantsville, Conn.—This invention relates to a seed planter which can be used for planting corn, cotton and other kinds of seeds, and which is so arranged that the plows and scrapers can be raised out of the ground with ease and facility, and that the same can be let into the ground to any desired depth.

SUGAR CANE STRIPPER.—S. Terry Hudson, Success, N. Y.—This invention relates to a device for stripping off the leaves of sugar cane, and consists in an arrangement of springs in pairs fixed upon a movable stand support, which may be stuck upright in the ground in the field anywhere convenient to the cane, and shifted about as the leaves accumulate in stripping, so as to save handling them.

MANUFACTURE OF IRON AND STEEL.—Lorenzo Sibert, Mount Solon, Va.—The nature of this invention consists in a new method of treating cast iron produced in an ordinary blast furnace for the manufacture of iron and steel of superior quality.

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 50 cents a line, under the head of "Business and Personal."

P. T. L., says if you rub your finger on the outside of a glass lamp from the surface of the oil upward, a thin film of oil will appear to rise on the inside.

W. N. B., of Iowa.—The barrels of double barreled guns are so set that the shot from both barrels may strike the same spot. They are slightly inclined to each other toward the muzzle, and the lines of direction are intended to meet at the ordinary distance of firing. Shot gun barrels should be more inclined than rifle barrels.

G. W. M., of Pa.—Concrete is a mixture of mortar with coarse materials like gravel and fragments of brick and stone. When the concrete is to be exposed to water, hydraulic cement should be used instead of lime. Lime mortar may be mixed with cement in any proportion, but the hydraulic property of the concrete is lessened by the increased proportion of lime. Whether a concrete or stone wall should be used for a cellar and foundation would depend mainly upon the cost of material when the work is to be done. A concrete wall is not so durable as a wall of hewn stone.

R. F. W., of N. Y.—The spectacle lens you send is a genuine pebble *i. e.*, it was cut from a crystal of quartz. Such lenses are often designated by the locality from which the quartz was obtained as Brazillian, Scotch, Madagascar, etc. A genuine pebble lens will readily scratch window glass.

J. H. W., of Mass.—The water and steam in a boiler when the fire space does not reach above the surface of the water are at the same temperature.

P. D., of C. W.—The publication of your article on the Harrison boiler would provoke a discussion which would be neither interesting nor important to a majority of our readers.

L. T. R., of Conn., suggests that some ingenious inventor "fix up" a whistle to be operated by the wheels of the vehicle used by milk men, meat and other peddlers to announce their approach.

A. J. W., of N. Y., wonders that some genius does not invent a small hand blower to supersede the common bellows for family use. One operated by clock work, cheap and efficient, he thinks would sell like hot cakes.

N. D. H., of Pa.—The ordinary method of getting rubber into the form of sheets is to grind it up in a machine called a masticator. In this process the rubber is softened and made more plastic. In this condition it is passed between powerful rollers or callenders, from which it comes in a continuous sheet. Another plan is to spread a thick solution of rubber on a level surface, and allow the solvent to evaporate. Coal tar naphtha and light petroleum oil are suitable solvents. The rubber used in these processes must be raw or unvulcanized.

D. W. P., of Pa.—A good way to purify the mercury of your steam gages, which you say has become foul, is to wash it in a strong solution of sal soda, and then filter it through a cornet of paper, that is paper rolled up so as to make a narrow conical cup which shall have a very small opening at the bottom for the mercury to pass out. The mercury should be filtered several time until it is completely dry.

R. L., of Pa.—The specimen you send is specular iron ore. When pure it contains 69⅞ per cent of metal. Your sample is slightly magnetic.

J. K., of Pa.—Fermentation of beer, and consequently the generation of carbonic acid, may be checked by cooling to near the freezing point. But the cooling will not destroy or decompose the carbonic acid already formed, as you appear to suppose.

G. A. H., of Pa.—The Ruhmkorff apparatus is simply the ordinary induction coil which is used for medical purposes, on a large scale. In a large apparatus the electricity has great tension and great care is required to secure insulation. The primary wire is only a few yards in length and is wound on a pasteboard tube. The primary helix is inclosed in a glass tube and upon the glass tube the secondary wire is wound. The secondary wire should be one or more miles in length; fifty miles of wire have been used in a single machine. The secondary wire is covered with silk, and each layer is further protected by a coating of melted shellac. For experimental purposes the secondary wire is sometimes divided and wound in separate helices, so that a part or the whole may be used.

P. J. R., of Ohio, is not satisfied with what has been said on the question "why ice is slippery," and propounds the theory that ice is composed of smooth globular particles which are easily detached, and that a body sliding on ice rolls on these particles.

G. W. B., of N. Y., believes that the influence of the moon on the growth of plants is generally recognized, and has been informed that a man has restored his hair, which had become quite thin, by having it cut immediately after each new moon!

A. M. D., of Mass., has a machine which has become so thoroughly charged with electricity that its operator is affected badly by it. Near the driving pulley is a 10 inch belt which travels 1,200 feet per minute and from which the electricity comes. The electricity may be taken off from the belt before it reaches the machine by arranging near it a series of metallic points which unite on a wire conductor leading to the ground.

E. S. G., of N. J.—A gas meter measures the gas by bulk only, and therefore when the pressure is much varied it does not register correctly. At high pressures the meter underestimates, . . . We have not heard of any water wheel which establishes a new principle in pneumatics.

B. F. W., of Ala., says he can get a hundred wagon loads of mica from the mountains at little expense, but it is not able to say that it is of commercial good quality. He should send a fair sample of it to some reliable chemist or mineralogist and ask his advice.

E. W., of Pa., is a miller and desires to learn how to rid himself of the first known as the pest known as the bolt eater. It is a black bug about half an inch long and destroys the silk bolting cloths, each of which is worth fifty dollars.

E. G. G., of N. Y.—There are many patents concerning mixtures of tar with gravel, sand, fragments of stone, etc., to be used for garden and other walks. It is not proper for us in this place to give a catalogue of the patents or to discriminate between their respective merits.

N. P., of Phila.—One of the best articles for destroying cockroaches are red wafers—scatter a few about the places where they most appear and they will eat them with a relish and soon die. The Persian insect powder is also a good article for the purpose but phosphorus paste is better than the latter.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Parties having a deposit of "mica" can sell by addressing W. W. B., 26 Holliday street, Baltimore, Md.

Flax Mill Wanted at Coloma, Ill. See advertisement and address A. P. Smith, Sterling, Ill.

Molders' Tools, Surface Gages, etc. (Manufacturers of), send price list to "Traveler," Box 143, Grand Rapids, Mich.

The Great Mormon Tabernacle at Salt Lake.

Our engraving presents the commencement of the structure, which has since progressed so far towards completion as to have the bents upon both sides added, and to be largely covered in. By it a correct idea may be had of the enormous size of the building, and the mechanical difficulties attending the construction of so ponderous a roof. The credit of carrying on such a vast work can best be appreciated when it is borne in mind that the timber is brought from a considerable distance, and other materials imported from the States.

This building was not constructed with any view to display architecture, but merely as a temporary meeting place for the people to assemble, and to take the place of the old Tabernacle and Bowery, the former of which was a large building, and the latter simply a huge shed covered with green boughs. Inside of the Tabernacle an organ is now constructing, second in size to none in the United States except the celebrated one in Boston.

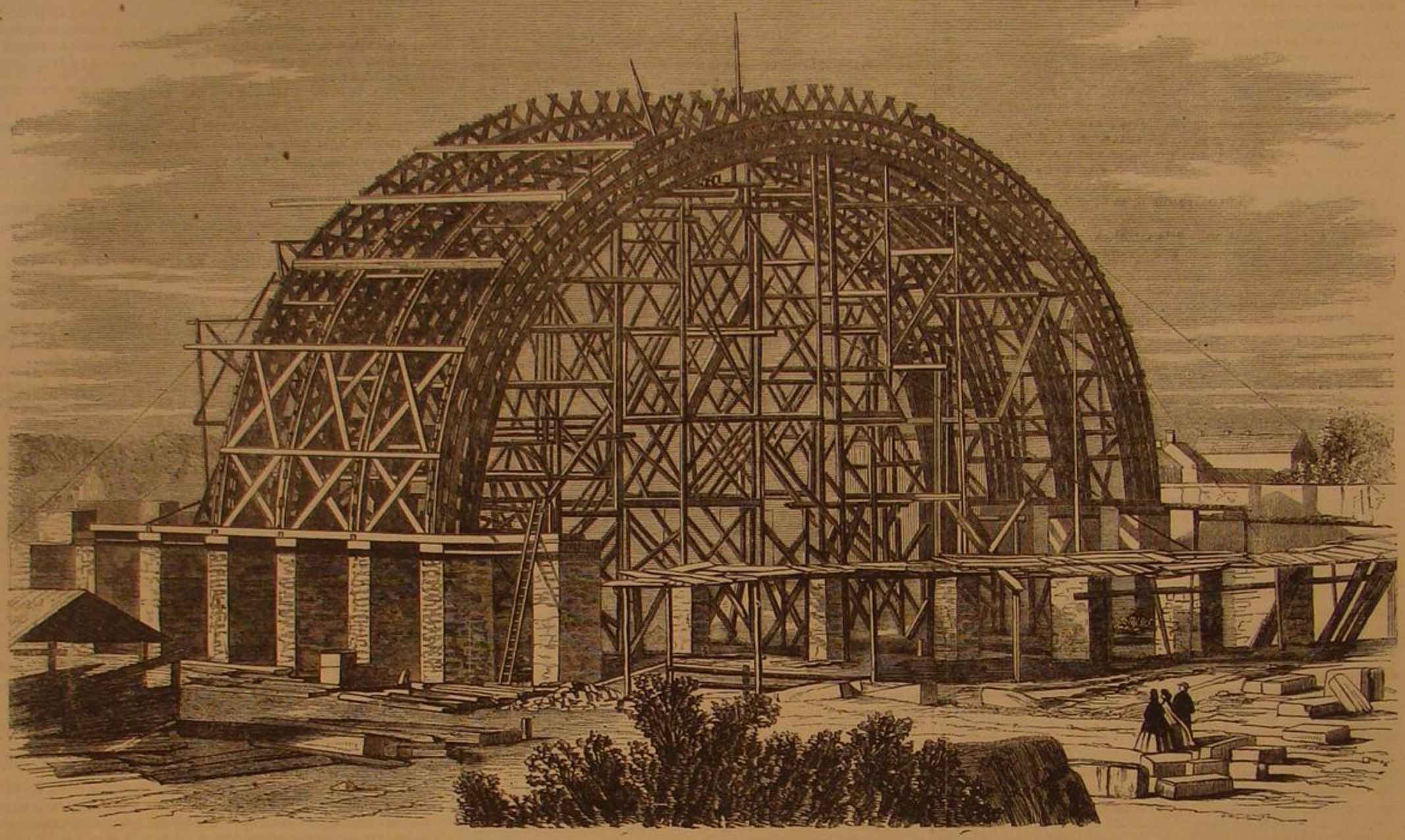
Our readers must not confound this edifice with the great Mormon Temple, which is a far more elaborate structure, of cut granite, erecting not far from the Tabernacle, and more slowly progressing. The granite is brought from a distance of about ten miles, and the blocks are so large in size, and the quantity so great, that a canal is being built to the neighborhood of the quarry for transportation of the material.

The Tabernacle is in the form of an ellipse, with an extreme length of 250 feet, and width of 150; extreme hight of roof 78 feet; hight of ceiling 68 feet. The immense roof frame rests upon 44 cut stone piers, about 12 feet apart and 20 feet in hight, which gives 48 feet of spring to the arch. The 44 bents, or principal rafters forming the arch are composed of 6 thicknesses of 2½ inch plank, framed like lattice work, strongly pinned and bolted, and tied together by 15 horizontal cross timbers on the outside, upon which the smaller rafters for the sheeting will be laid, and 15 similar cross timbers inside, to which the ceiling joists will be stayed. The 13 half bents, resting upon the 13 piers, in curve, at each end, join diagonally upon the apex of the arch of the two outside parallel bents.

The stand will be in the west end; the floor to be laid level for a distance of 60 or 70 feet in front of the stand, thence gradually raising to the east end, where the seats will be level. It is estimated that the house will seat about 10,000 persons.

But, large as is the extent provided for the accommodation of the people in the above building, it is now feared that it will be too small and that further accommodations will be necessary. For freedom of egress, a very material consideration where large audiences are concerned, ample provision has been made in the folding door appointments of the entire space between the 9 piers in line on either side.

A cornice, 8 feet deep, will ornament the stone work. In the majestic, towering, self-supporting roof of this building, there will be consumed nearly 1,000,000 feet of lumber. When finished it will present the appearance of a ponderous half globe, with sides slightly compressed, and although of a plain rather than a grotesque style of architecture, it will from its vast proportions and striking originality of design, make a marked impression upon every beholder, and will stand a monument of magnificent zeal and unparalleled unity of purpose and labor on the part of the Mormon people.



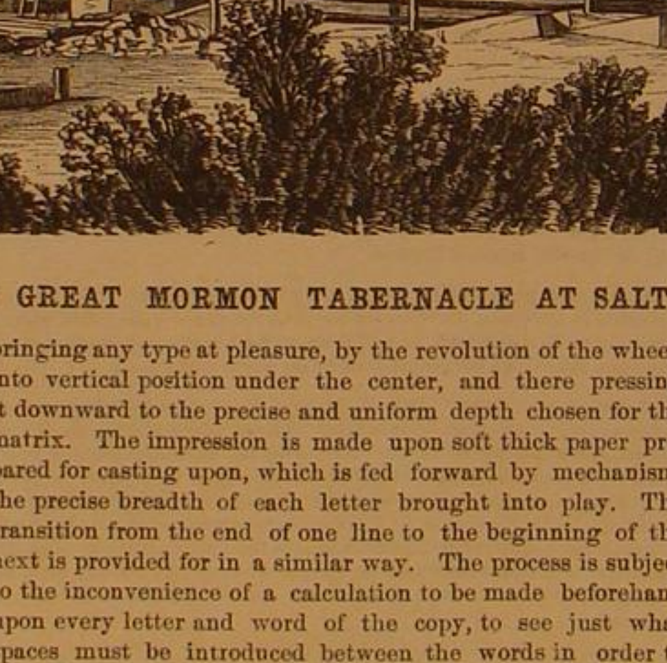
THE GREAT MORMON TABERNACLE AT SALT LAKE.

Sweet's Matrix-Printing Machine.

The principle of this ingenious American invention, which excites so much interest at the Paris Exposition—having even been elaborately described and illustrated in the *Engineer*—is the arrangement of a complete alphabet of steel types radially upon a vertical wheel, with apparatus for bringing any type at pleasure, by the revolution of the wheel, into vertical position under the center, and there pressing it downward to the precise and uniform depth chosen for the matrix. The impression is made upon soft thick paper prepared for casting upon, which is fed forward by mechanism, the precise breadth of each letter brought into play. The transition from the end of one line to the beginning of the next is provided for in a similar way. The process is subject to the inconvenience of a calculation to be made beforehand upon every letter and word of the copy, to see just what spaces must be introduced between the words in order to fill each line with precision, since the line cannot be "justified" if unequal, after being imprinted.

MORRIS' SELF-OILING BOX.

The box seen in the engraving was patented through the Scientific American Patent Agency, Jan. 1, 1867. It is a device for lubricating the journals of shafting, by means of a reservoir in the body of a box and an arrangement of parts for distributing the oil to the shaft. It is not expensive in construction and appears to be very effective in operation. By reference to the engraving it will be readily understood. The engraving shows only the lower part of a stand box, as the cover does not materially differ from those in ordinary use, except in a particular hereafter to be mentioned. Hanger boxes can be made with the peculiar devices shown in the engraving as well as stand boxes.



A is a reservoir for the oil, cast in the box, having an incline toward one side on which rests a flat slotted spring, B, which supports the pivots of the disk wheel, C, the body of which projects through the slot so that its surface turns in the oil. As the shaft revolves the wheel turns by its slight pressure upon the shaft, shown by the dotted lines, and brings the oil to the surface of the shaft. Any superabundance of the oil is deposited in the longitudinal channels in the face of the box, which communicate with end channels conforming to the contour of the box. From these end receptacles passages lead under the lining to the central reservoir. The direction they take is shown by the arrows, and their apertures are seen at one end and in the center. The cover has end passages or channels corresponding with those in the box and an oil hole over the outer portion of the rim of the roller, C.

It will be seen that a continual circulation of the oil is kept up and that no oil can escape from the box to be wasted. With this device drippers to hangers are unnecessary, and the journals will run for months without being oiled.

Further informatiou relative to this box can be obtained of the patentee, Geo. M. Morris, Cohoes, N. Y.

Ericsson and the British Navy.

An English journal which champions the cherished broadside system of the British navy, having attempted to weaken the influence of Bourne in favor of the monitor system by insinuating that he was an agent for Capt. Ericsson, Mr. Bourne has published certain correspondence showing that Ericsson at his solicitation had consented a year or two ago, to give the Admiralty any advice that might be desired in the construction of turret ships. Having failed however, to induce the Admiralty to act in this direction, the matter dropped. The following is the concluding portion of Mr. Bourne's last letter to the Secretary on the subject:—

"In now notifying to you Captain Ericsson's acquiescence in this decision, I may be permitted to express my regret that their lordships have not been able to render available for the public interests the talents and experience of one of the most remarkable men of the present age, and his assent to my proposal that he should give the Admiralty the benefit of his information, I thought it a matter of some importance to have obtained, especially as he was willing to act without emolument or conditions, both his reputation and his wealth rendering him independent of such considerations.

"I have the honour to be, etc.,
J. BOURNE."

"London, May 20, 1866.

THE HAMMOND RIFLE—A new American breech-loader—receives very high encomiums in England. The British Government, which has adopted the Snider conversion for the Enfields, pending a mature and final selection, have ordered a competitive trial of all patterns, and the *Mechanics' Magazine* predicts that the Hammond rifle and the Daw cartridge will be formidable competitors among the 93 which the Commission already have before them.

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ANOTHER NEW AND REMARKABLE TEXTILE.

It will be pleasant indeed to find the enthusiastic anticipations of M. Benito Roezl, of the eminent French naturalists, Blume, Decaisne, and others, and of Mr. A. B. Bacon, chairman of the Section of Agriculture, New Orleans Academy of Science, realized in respect to the *Ramié* or Boehmeria tenacissima, of Java. From the nature of the case, anticipations so high must seem extravagant, and be held subject to extra hazards of disappointment, until their actual accomplishment leaves no place for conjecture. From a communication by the last-named gentleman to the Academy of which he is a member, we learn that at present the exotic is introduced and flourishing in a large plantation in Mexico, and that the conviction of the naturalists who have nursed it and experimented upon it for the last twenty-three years, that its fibre is stronger than hemp, as fine and white and twice as durable as linen, and more productive than cotton, is so far confirmed that in 1865 M. Roezl exported and sold in England over 5000 lbs. of the staple at double the price of the best quality of cotton. Its beautiful fabrics will be displayed in the Paris Exposition, but we have as yet received no account of them.

The Ramié belongs, like the hemp and the nettle, to the *urticaceæ*, and was transplanted from the island of Java to the Paris Jardin des Plantes, by Blume, in 1844, where it was reared in the hot-house until its introduction into the more congenial climate of Mexico by M. Roezl, former head of the Horticultural Institute of Belgium, within eleven years past. It is considered that only the middle and southern portions of our Gulf States will afford it a suitable climate, and that in that latitude it will make three or four crops a year, each equal in quantity to the most prolific of hemp.

The perseverance of Mr. Roezl in domesticating the staple in the western world has been almost romantic—perhaps we should say heroic—and richly deserves the high reward his friends anticipate for it. Having first gone to Java and spent a year in familiarizing himself with the character and growth of the plant, he emigrated to Mexico with a store of its roots. On his way to the capital he was robbed of his treasure by the Mexican banditti, who took little benefit from their crime, and was obliged to write to his friends in Europe for a new supply, which was at length procured through the good offices of the British navy: but this perished on the voyage to England. Again it was attempted, and again the plants were killed. A third attempt succeeded, but the plants had to be placed under hot-house cultivation in England, to give them strength for another great voyage. At last, in 1859, after six years of waiting and endeavor of this kind, his plants arrived half dead, and with the skill of an accomplished and scientific horticulturist he nursed them successfully into life, and within two years found himself the owner of a thriving plantation.

This was but raw material, and the least part of the difficulties had been overcome. He imported from England the most approved machinery for cleaning flax and hemp, but it proved unsuited to the requirements of so fine a fibre. Two years of effort in this direction were spent in vain, when he fell back upon his own tireless resources, and in two years more produced two inplements of his own invention by which the stalks were converted within twenty-four hours after cutting, into long skeins of pure, white and silk-like fiber, ready for spinning. In February last, Mr Roezl visited Cuba with specimens of the results of his eleven years labor, which after careful examination were pronounced of the first importance by the naturalists and agriculturists of the island, who predict that it will supplant tobacco and coffee as a preferable staple for Cuba. Mr. Roezl takes five crops per annum from his plantation, the matured plant, which is perennial, attaining when well rooted the hight of twenty feet.

CONDITION OF THE PATENT OFFICE.

Nearly two months ago, in announcing the passage by Congress of a bill to increase the examining force of the Patent Office, we commented as follows:—"The Commissioner is now clothed with ample authority. We understand that he intends to fill all new positions by promotions, which is certainly very commendable. We earnestly hope that the Commissioner will act promptly and energetically in carrying the new measure into effect. The business of the office is suffering very much from the delay which attends the examination of cases, and now that the Commissioner has the power, we hope that he will employ it to infuse new life and vigor into the Department."

We have yet to learn that the Commissioner has made a single new appointment or taken any active measures towards bringing up the back work of the Office. Hundreds of applications are awaiting action, some made six months and more ago. Inventors are getting discouraged, and everybody who has business transactions with the Office is disappointed that the Commissioner does not avail himself of the authority vested in him by Congress to increase his force. In some classes the examinations are closely up, but in others they are several months behind. This condition of things should not exist, and with the power ceded to the Commissioner by our last Congress, there is no occasion for it. Wake up! Mr. Commissioner: inventors are busy, applications for patents never were greater, the treasury of the Office is plethoric, and now all that is wanted to make the Patent Office the most prosperous department under Government is a vigorous administration.

MODES OF WORKING WOOD.

So much of the public attention has of late years been directed to the new preparations and applications of the metals, particularly iron and steel, that the merits of that old time friend of man civilized as well as savage, wood, are likely to be overlooked. Volume after volume is issued from the press, and our periodicals are filled with articles devoted to the properties, qualities, uses, and manipulations of the metals, while those which treat on wood are few and far between. Still, it would be difficult to imagine, in our present state of advancement, where to look for a substitute which should combine so many qualifications of usefulness and such adaptability to diverse manipulation.

Besides the hundred applications of cutting, splitting, and sawing, wood can be worked in many more ways. It is doubtful if any substance with which we are acquainted is suceptible of so many radical changes—changes which alter the very structure of the material and adapt it to the most opposite uses. It can be torn into fibrous shreds which make elastic cushions or beds; made into a spongy, porous mass; hardened by chemicals which change its texture and make it semi-mineral in nature; compressed by mechanical means, closing its pores, until it is nearly as compact as the metals. It may be molded into various forms; bent to keep its enforced position; dissolved into pulp and made into paper; separated into *laminæ* by percussion, and, in short, treated in any conceivable manner except melted and cast.

Perhaps one of the most interesting of the methods of working wood is that of separating one layer from another by percussion, or by compression joined to bending. Those woods only can be treated in this way which grow by external concentric accretions, as many of our hard wood trees. The wood for this treatment should be tough, elastic, and straight-grained.

The Indians of this country, and the basket makers in others, separate the layers of the wood by beating upon the surface of a log with heavy mallets, when the wood comes off in thin *laminæ*. This method of disintegrating wood is one of the oldest of human arts; probably no mode of working wood is older. What was formerly done by hand is now, however, performed by machinery. We saw the other day, in Jersey City, machinery which performed this work in a remarkably rapid and effective manner. It was run by the Wilder Hoop Machine Company, and was designed for making (rolling) hoops of wood from a "bolt" split from a log. The wood used was black ash, although any tough, straight-grained wood would answer. The bolt was a longitudinal cleft the cross section of which might approach either a parallelogram or a triangle. One end was presented to a space between two swiftly-revolving heads armed with cutters which almost instantly formed a wedge-shaped point, then to another disk with thin cutters which splits the V-shaped end at intervals corresponding with the thickness of the hoops to be made. These splits do not extend more than one or two inches from the end. The bolt is then run between circular saws and trimmed to nearly a square form, or to a parallelogram, one side of which corresponds with the width of the hoops.

Then the bolt is passed between upright corrugated feed rollers held in contact by powerful springs. Directly behind these were a set of smooth rollers, placed horizontally, between which the bolt passed, being compressed powerfully, and by means of a curved guide compelled to take a short curve. The result was a splitting from end to end of the bolt, forming perfect hoops, or rather slips of equal thickness throughout. The philosophy was not difficult to understand. The slits cut in the end of the bolt were starters for the thickness of the splits. The wood, being wet, yielded to the compression of the rollers, and the direction given the bolt by the curved shoe compelled one piece to slide upon another sufficiently to divide the cross fibers and insure a separation. The whole process is a very brief one, occupying no more time probably than would be spent in reading this description. It is very interesting and gives the observant man new ideas concerning the capabilities of wood. That its fibers can be cleanly separated, simply by compression and bending, to make as smooth a job as if sawed, and preserve the longitudinal grain and consequent strength as perfectly as if split by ordinary means, is at least surprising.

THE GULF STREAM AND THE CUBA TELEGRAPH.

A special survey has been made under the direction of the Acting Superintendent of the U. S. Coast Survey, Mr. J. E. Hilgard, at the instance of the International Ocean Telegraph Company, with a view to determine the conditions to be encountered in locating the cable between Florida and Cuba, through the Gulf Stream. The examination reveals a very irregular and precipitous descent from the Cuban coast, reaching the maximum depth of the channel, 843 fathoms (say 5,000 feet) 37 miles from the Moro. From the northward, the bottom falls away in terraces without abrupt slopes. It is in the deep cañons or gorges of the southern portion that the Gulf Stream and its counter currents find their channels; while the sea lies almost motionless above the terraces of the northern coast. About 21 miles from the coast of Cuba, a submarine mountain rises in the midst of the southern channel, with the extreme depths of 748 and 843 fathoms on either side of it. The summit of this mountain is 2,400 feet above the bed of the straits and reaches to within 2,400 feet of the surface: the current running over it so strongly that soundings were made with great difficulty. It appears to be triangular in its general form, with precipitous sides, presenting at its west angle a bold prow to the stream.

Assistant Henry Mitchell, from whom these data are derived, states that the observations indicate the depth of the Gulf Stream to be scarcely more than one-third the maximum depth of the channel. He concludes that the Gulf Stream is not a profound movement, but an overflow of water from the Gulf, having for its office the restoration of surface level, while the office of the counter stream, or "polar current," beneath, is the restoration of equilibrium thus disturbed between waters of different specific weights or densities. This view of compensating currents is illustrated by observations in the Hudson river. In the dry season (July) the surface outflow of the river through the Narrows has been found to occupy three-fourths instead of half the twelve tidal hours; while in the under stratum the case is more than reversed, and the inflow predominates to such an extent that as a general thing it is constant along the bottom, although not in velocity; and the same conditions with variable proportions, obtain for some distance up the river. On running a line of levels from New York to Albany, it was found that the bed of the Hudson river lies below the mean level of the sea for over a hundred miles, while the surface of the fresh water, or river proper, in the dry season, is above this level, yet not so much above as to counterbalance the excess of specific gravity in the sea water, which consequently during the summer months flows in along the bed of the stream, while the fresh water overflows into the ocean. In other words, the Hudson, for one hundred miles, is in the summer but an arm of the sea analogous to the Gulf of Mexico, deriving much of its elevation as a stream, from a like cause with that of the Gulf stream, viz: its lightness, lifted above the sea level by the bottom pressure and inflow of the heavy sea water in the opposite direction.

The striking variations in the velocities of the Gulf Stream, which were particularly remarked by navigators during the late survey, the weather being exceedingly calm, are accounted for on the hypothesis that they follow the changes in mean sea level which depend upon the declinations of the sun and moon—more especially the latter. Prof. Bache has shown that the mean level at Key West is one foot higher when the moon is in the equator than when she is at her greatest declination; while, on the contrary, in the North Atlantic the mean level is about three inches higher at her *maximum* declination: giving a variation of fifteen inches in level to account for the variations in the velocity of the stream.

THE PRICE AND PROSPECT OF BREAD.

We have remarked the extraordinary phenomenon of breadstuffs going from east to west instead of west to east, and even from Europe to America in a few exceptional instances. The fact is that there is more flour and wheat at the east than at the west, and although the stocks on hand in New York are much larger than last year at this time, while large shipments are made from California, those in the west are much more than proportionally smaller, and prices equally high; so that the aggregate of breadstuffs in the country is evidently reduced enough to fully account for the present enormous prices. Among the causes of scarcity are the short western crops of last year (resulting partly from a scarcity of labor which the war has left as a melancholy memorial of its carnage) the half extinct agriculture of the South, and its heavy drain upon the northern markets. The anticipated crops, rich as their promise is, cannot therefore exert their natural effect upon prices, and will not begin to replenish the market at all under two months. But before that time, if no new calamity or portent intervenes, the coming harvests will cast their shadows before, and discourage the extortion of speculators materially. When they are fairly in the field, it may be rationally hoped, the prices of food will come down to a more reasonable scale than has been known for years. The most cheering accounts of the wheat prospect pour in from every section of the country. The South has devoted an unprecedented proportion of land to food, and the crops promise unusually well, while in the West, the mighty tide of immigrating labor has filled up the ghastly chasm left by the war, the high prices have

produced a great increase in the breadth of land sown,—in some regions nearly double—and Providence has smiled upon the buried seed and the tender blade. The deep snows of the winter have protected the wheat, and from every section comes the report that it is growing magnificently and promises a glorious yield, far surpassing in the aggregate any crop ever before raised in this country. The Puritans of New England, taught by hunger to feel their dependence on the God of nature, used to fast and pray one day in every spring, for a blessing on their hard fields, and their descendants keep up at least the form in the New England states to this day. Our crops have yet to run the gauntlet of many foes, and may the Providence whose bounty we have seen so marvellously enlarged in modern years, still regard mercifully the wants of our toiling millions, and "God save the wheat!"

The report of the Agricultural Department for April says: "Never has there been so general an expression of encouragement in view of the fine condition of winter wheat since the establishment of the present system for the collection of crop statistics. In more than nine tenths of the returns received, the condition of the crop is reported favorable and promising. From the South the returns are as cheering as from the West. The report states, however, that the loss of cattle from starvation and exposure the past winter has been extraordinary. Beef is not likely to be any cheaper.

GLEANINGS FROM THE POLYTECHNIC ASSOCIATION.

Dr. Feuchtwanger showed a specimen of tellurium, an exceedingly rare substance commonly classed among the metals but which has much analogy in its properties to sulphur and selenium. The French call this substance one of the metalloids. In its native state the ore is found combined with iron, gold, or silver. Its color is silvery white and brilliant, and in appearance it closely resembles antimony. It is found in the Altai mountains and in Transylvania. The specimen shown was found in a gold mine of California.

Mr. Fisher exhibited drawings for a steam-plowing machine or more properly a pulverizer. The machine resembles a locomotive with a short boiler, and mounted on wide tired wheels. The power is applied to drive a drum having circular saws thereon set three inches apart. By suitable gearing the engine advances slowly while the drums rotate with great rapidity, pulverizing the soil to the proper depth. The subject of steam plowing being thus introduced, its importance was acknowledged by all, but an animated discussion sprung up respecting the relative advantages of employing traction engines working the plows directly, or stationary engines working the plows by means of chains, as is the common custom in England. Both methods had their advocates who warmly argued their respective merits. It was claimed on one side that the traction engine beats down the field in front of the spaders which it afterward is made to plow up, as the wheels must be made wide enough to prevent the machine from sinking into the ground.

Mr. Parmelee read a paper on gypsum, describing its nature, and referring more especially to its use as a fertilizer. Its value in this respect he asserted was owing to its absorptive power in taking in ammonia from the atmosphere and storing it up to be disseminated by the rains through the fields.

President Tillman gave the club the results of some experiments he had witnessed at the works of the lead encased block tin pipe company, showing that this pipe possessed the same strength as that of lead pipe of twice its weight. He also referred to the dangerous effects from using water drawn through common lead pipe, and advocated the passage of a law which would prevent its employment in this capacity. He was followed by several members speaking on the same subject, describing minutely the action of the poison and its different effects. Some persons are more susceptible to its injurious consequences than others, as is well known to be the case in regard to painter's colic and kindred complaints.

Mr. Walling repeated the beautiful experiment lately performed by Prof. Thompson of Edinburg before the Royal Society of Scotland, and described in the article on "wirbel bewegung" on page 212, current volume. These air vortexes are very frequently produced in nature and are made visible when smoke or steam is mixed with the whirling air. They may be seen when cannon are fired, particularly if the muzzle is "slushed" with grease, also as issuing from the smoke stack of a locomotive just starting: human smokers constitute perhaps the largest number of experimenters in this line. Mr. Walling remarked that the molecular theory based upon this phenomenon by Prof. Thompson, was an indication of the tendency of scientific opinion towards some such purely dynamical theory as had been previously proposed by himself.

Tin Lined Pipe for Water.

On Thursday the 23d of May an exhibition of the method of the new manufacture of lead pipe lined with block tin was given at the manufactory of the inventors and manufacturers, foot of west 27th street, New York. The visitors invited had an opportunity to witness the processes from the first casting of the core of tin to the production of the pipe in its finished state, and the sentiment was general that it was a complete success. We have no time nor space in this issue to describe the processes, nor to state the facts established by the experiments. In our next we shall endeavor to show the immense advantages of this over the ordinary water pipe.

THE hardware manufactory of Sargent & Co., New Haven, Conn., gives employment, at its full capacity, to 800 hands, and turns out 4,000 different articles of hardware to the amount of $4,000,000 to $7,000,000 per year.



ISSUED FROM THE U. S. PATENT OFFICE
FOR THE WEEK ENDING MAY 21, 1867.
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.

64,826.—DEVICE FOR HOLDING CIGARS.—Charles Appel, Hoboken, N. J.

I claim, as an improved article of manufacture, a cigar holder consisting of a combination of the shells, A B, with the cutter, d, the latter either being attached to one of the shells or being part of the same, all made and operating substantially as and for the purpose herein shown and described.

64,827.—LIME KILN.—George Atkins, Sharon, Pa.

I claim the arrangement of the lime kiln formed of the chambers, A B D, and heated by furnaces, C C', at different levels inside the kiln, operating substantially as and for the purpose herein described.

64,828.—HAY PRESS.—George H. Aylworth, Brighton, Ill.

I claim a hay press, consisting of the box, a, and the sliding partition, k, operated by means of the screws, c b, the whole constructed and arranged as herein shown and described.

64,829.—CARRIAGE-WINDOW FRAMES.—Francis Baker, New York City.

I claim a carriage-window frame swiveled or pivoted to uprights, F, arranged to move in and through the carriage body, and bent springs, K or L, hooks or catches, N, and studs, I, substantially as and for the purpose described.

64,830.—SEWING MACHINE.—Robert Barclay, Buffalo, N. Y.

I claim, First, The sliding rod, q, situated between the needle slide and tension device, t, in combination with the needle operating shaft, E, and cam, r, the whole arranged and operating as and for the purpose specified.

Second, The combination and arrangement of the adjustable pivoted dog, m, slide, o, and lever, G, in combination with the presser foot, D, constructed and operating substantially as and for the purpose set forth.

64,831.—LIQUID FOR CARBURETING GASES.—John A. Bassett, Salem, Mass.

I claim the hydrocarbon liquid for carbureting gases, produced by the combination and process described substantially in the foregoing specification.

64,832.—PEAT MACHINE.—Alfred Bridges, Newton, Mass.

First, I claim the arrangement of the sleeve, C, passing over stock, D, in the manner and for the purpose described herein.

Second, The adjusting plunger, E, by means of projection, d, and spring, C, or its equivalent, as above specified.

64,833.—RAILWAY SWITCH.—James S. Brothers, Duncannon, Pa.

I claim the constriction of the chair, K, with the adjustable frog, G, when arranged, combined, and operated as herein described and for the purpose set forth.

64,834.—QUARTZ MILL.—Samuel C. Bruce, New York City.

First, I claim the revolving wheels, C and D, with velocities varying in some regular ratio, so that wheel, D, shall always revolve faster than, and in the same direction as, wheel, C, and for the purpose described.

Second, The arrangement of wheels, C and D, revolving in the same direction, in separate but communicating cases, A and B, and so constructing said cases and arranging them with reference to said wheels and their shafts that the external air can enter at aperture, E, only in the periphery of the case, A, substantially as and for the purpose described.

64,835.—SAW SET.—Benjamin N. Butcher, Philadelphia, Pa.

I claim the combination of the bed plate, A, with beveled edges of different angles of inclination, and the reversible and adjustable guide pieces, E and E', set screws, F and G, and sets, C D, substantially as and for the purpose set forth.

64,836.—CANE AND SORGHUM STRIPPER.—James A. Campbell, Stow, Ohio.

I claim, First, The rollers, G H, arranged substantially as shown and described, in connection with the stationary cutter or stripper, L, and the yielding or pressure cutter or stripper, M, having the lever, N, and spring, O, applied to it, substantially as and for the purpose set forth.

Second, The rotary topping cutter, Q, attached to wheel, R, in connection with the concave plate, S, all arranged to operate in connection with the stripping device, substantially as shown and described.

Third, The combination of the endless leaf and top-discharging apron, B, with the leaf-stripping and stalk-topping mechanism, substantially as and for the purpose herein set forth.

64,837.—PORTABLE SEAT FOR DRIVERS UPON CARS.—James F. Campbell and Cornelius Finney, Williamsburg, N. Y.

We claim the upright or staff, B, with hook at one end, and provided with a rod, E, having seat, G, and strap, H, substantially as and for the purpose described.

64,838.—BOTTLE STOPPER.—Horace S. Carley, Cambridgeport, Mass.

I claim the slide, F, carrying stopper, in combination with the swiveled loop, E, in which it moves, substantially as and for the purpose described.

I also claim, in combination with the above, the swinging clasp, I, substantially as described for the purpose set forth.

64,839.—WHEEL PLOW.—Elisha A. Chace, Rosemond, Ill.

I claim a wheel plow, having the stationary frame, A, pivoted frame, F F' F', plow beam, D, and elevating devices, G G1 G2, arranged to operate substantially as and for the purpose described.

64,840.—CLOTH-GUIDE FOR SEWING MACHINES.—George F. Clemons, Springfield, Mass.

First, I claim in a cloth guide for sewing machines the employment with a cloth gage of a rigid guide plate, adapted to bear upon the cloth in front of the sewing needle, and extend across the line of seam being sewed, and having elastic and adjustable pressure given to it, in such a manner as that it shall press more upon the cloth outside the seam than inside thereof, and thereby guide the cloth towards the gage face.

Second, The elastic plate, b, either with or without the rigid guide plate, a, combined with the pressure plate, e, screw, f, and gage, c, substantially as described and for the purposes set forth.

Third, The rigid guide plate, h, combined with the elastic plate, i, screws, J J, rigid plate, k, and gage, l, all with or without the link, n, substantially as described and for the purposes set forth.

64,841.—DEODORIZER FOR PRIVY SEATS.—Neil Clifford and A. N. Bell, Brooklyn, N. Y.

We claim the combination with the seat of a privy, water closet, or other similar place of whatever name called, of a receptacle or vessel for the reception and holding of any suitable deodorizer or disinfectant, whether in the form of a liquid or powder, when such vessel or receptacle is so constructed and connected with the seat board that by the depression or upward movement of the seat, or both, the said disinfectant or deodorizer will be discharged into the vault of the privy, etc., substantially as and for the purpose described.

64,842.—LOCOMOTIVE ENGINE.—Joseph M. Coale, Baltimore, Md.

I claim in combination with locomotives and other similar boilers, the additional sheet, d, and flues, f, for the purpose of preventing the cold air from chilling the ends of the flues proper, substantially as and for the purpose set forth.

64,843.—RAILROAD RAIL FASTENING.—John Cochran, Wall Township, N. J. Antedated May 13, 1867.

First, I claim the combination of a screw bolt or wood screw spike, with a cleat that has a bearing upon the top and at the edge of the rail flange, and also upon the cross tie, and so constructed or formed that it can be removed from the flange of the rail upon slackening up the screw bolt or wood screw spike by which it is secured to the cross tie, substantially as herein described.

Second, The heel spurs of the cleat for entering into the timber or cross tie, so as to hold against the lateral thrusts upon the rails, as caused by the action of the wheels of passing trains, in combination with the screw bolt or wood-screw spike fastening of such cleat, substantially as herein described.

Third, The peculiar construction of the cleat, by reason of which it may be made by pressure or percussion from flat iron bar, complete in all its parts, without necessarily altering the thickness of the material in any of such parts, substantially as herein described.

64,844.—STEAM GENERATOR.—S. M. Colburn (assignor to himself and Sylvester Colburn), Ansonia, Conn.

I claim the plate, B, constructed and arranged within the boiler, so as to form a chamber, C, communicating with the boiler by means of openings or perforations, a, substantially as and for the purpose set forth.

64,845.—MANUFACTURE OF GAS.—Joseph H. Connelly, Wheeling, West Va.

First, I claim the use of lime obtained from burnt limestone or oyster shells, dampened or slaked with water, salt, or saltpeter solution, introduced into the retort as described, in the proportion mentioned, for the purpose of whitening and desulphurizing the gas, as set forth.

Second, The use of lime prepared as stated, in combination with coal and residuum oils, introduced as described for the purpose specified.

Third, The combination of lime, prepared as stated, and cinders, coke, coal, or wood, with residuum oil alone, for the purposes mentioned.

Fourth, The use of residuum oil alone, in combination with lime, for the production of inflammable gas, desulphurized and whitened in the manner set forth.

64,846.—MEANS FOR STEERING VESSELS.—Robert Creuzbauer, New York City.

First, I claim, in combination with a steering screw, or its equivalent, arranged within a pipe or water way extending transversely through the hull of a vessel, a means which will enable the pilot to give a right or left motion to said screw or to stop or start it at pleasure without stopping or reversing the motion of the driving power, substantially as described.

Second, The combination of a steering screw or its equivalent, arranged within a water way extending transversely across the hull of a vessel, with a means which will enable the pilot from the pilot house to stop, start, or reverse the motion of an engine, which is used for rotating said screw, substantially as described.

Third, In combination with a steering screw, arranged to operate substantially as described, I claim the employment of an engine for rotating the screw, and a means for rotating the screw when the engine is in operation substantially as described.

Fourth, Providing for disconnecting the capstan shaft, F, from the screw shaft, d1, when this latter shaft is connected to and driven by the engine shaft, d2, substantially as described.

Fifth, The combination of the capstan or capstans upon shaft, F, with the gearing, E f f', clutch, g, lever, G', shaft, d', and with an extension, d2, of shaft, d', clutch, W W', and a driving engine, substantially as described.

64,847.—KEEPER FOR DOOR LOCKS.—George W. DaCunha, of New York city.

I claim an improved catch or nosing for door locks formed with a flange, d1, to project along or be led into the jamb, and with a flange, d2, to project along the casing, said flanges being cast solid, with and forming an integral part of the side catch, substantially as herein shown and described, and for the purpose set forth.

64,848.—HAY LOADERS.—Leopold De Lacee, Springfield, Ill.

First, I claim the revolving platform and raking device, D, composed of the frame, a, fitted in the main frame, A, and provided with the bars, E, having teeth, F, attached, all arranged substantially as and for the purpose specified.

Second, The raking and pitching fork, S, attached to a carriage, P, operated by an endless chain, Q, and arranged with ways or guides, J J, on a suitable framing or support, substantially as and for the purpose set forth.

Third, The swinging or pendant frame, T, in combination with the lever, I, bar, H, and clutch pulley, G, arranged to operate in connection with the revolving platform and raking device substantially as and for the purpose specified.

Fourth, The two pulleys, G G', connected by a clutch, and arranged as shown to operate respectively the revolving platform and raking device, and the raking and pitching fork substantially as shown and described.

64,849.—PLANING MACHINES.—William H. Doane, Gerritt V. Orton, and William E. Loudon, of Cincinnati, Ohio, assignor to J. A. Fay & Co.

First, We claim the combination of the adjustable break irons, k' k', with the cutters, k k, and the removable collars, h h, all constructed and arranged in the manner and for the purpose described.

Second, The application of the shield, G, to a post, m, which is allowed to revolve around the cutter head substantially as described.

Third, Sustaining the safety shield, G, upon the table top, A, by means which will admit of said shield being moved around the axis of the cutter-head, and also adjusted vertically substantially as described.

64,850.—WHEEL VEHICLES.—James W. Drew, Stockbridge, Mich., assignor to J. N. Townson and James W. Drew, Antedated May 16, 1867.

I claim the crooked sway bar, H, and the cross bars, I and J, in combination with the axle, C C, and the axle guides, G G, the whole constructed and operating in the manner and for the purpose herein described.

64,851.—COCKS.—Charles M. Alburger, (assignor to George R. Kirk), Philadelphia, Pa.

I claim the follower, A, having its metallic packing, E, and elastic packing, e, and elastic packing, e', in combination with the spring, D, flanged thimble, F, packing, E, and spigot, C, substantially as described for the purpose specified.

64,852.—CONVERTING RECTILINEAR INTO ROTARY MOTION.—James A. Ehle, Green Bush, Wisconsin.

First, I claim converting rectilinear motion into rotary motion by the use of polygons substantially as described.

Second, The balanced lever, B, the connecting rods, C C, the carriages, D, and the guides, E, substantially as described and for the purposes herein set forth.

Third, The pins, f, forming hooks upon the triangles, E, and the bar, b, in combination substantially as shown and described.

Fourth, The cam wheel, L, in combination with the triangle, E, and the gear wheels, H and k, substantially as herein shown and described.

64,853.—PORTABLE ROOFING BOILER AND FURNACE.—Perry Fenlason, Cincinnati, Ohio.

I claim the boiler, B, in combination with the spring dray, A, or its equivalent, constructed substantially as above described and for the purpose set forth.

64,854.—ATTACHMENT TO STOVES FOR GENERATING GAS.—B. L. Fetherolf, (assignor to himself and J. N. Headesty), Tamaqua, Penn.

I claim the hollow metallic block, A, fitted within the fire chamber of stove so as to constitute both a gas generator and a lining or fire back, substantially as described.

64,855.—PUTTING UP OILS IN CASKS, &c.—P. G. Finn, Erie, Penn.

I claim the barreling and hermetically sealing of coal oil in a heated and expanded state, substantially as and for the purpose set forth.

64,856.—EDIBLE COMPOSITION.—Daniel Fobes, (assignor to Fobes, Hayward, & Co.), Boston, Mass.

I claim the edible composition as made of the materials in the manner and for the purpose substantially as described.

64,857.—EXTENSION TABLE.—George F. Folsom, (assignor to himself and Charles F. Pease), Roxbury, Mass.

I claim the combination as well as the arrangement of an auxiliary leaf, E, and mechanism (viz. its rods, k, elevators, H, and their counter cams, or the equivalents thereof,) for operating it as described with two leg frames, and their main leaves, D D, one of such leg frames being constructed with a space or recess arranged below the main leaf, and for the reception of the auxiliary leaf when the table is closed as described.

I also claim the combination as well as the arrangement of two auxiliary leaves, E E, and mechanism for operating them as described, with the three frames, A B C, and their main leaves, D D, arranged together as specified.

I also claim the combination as well as the arrangement of two turning leaves, F F, two main leaves, D D, three of the frames, A B C, as described, two auxiliary leaves, E E, and mechanism, viz.: its rods, k, elevators, H, and their counter cams or the equivalent thereof), for operating such leaf or leaves, E, as described.

I also claim the peculiar mechanism in combination applied to each turning leaf, and for operating each of the auxiliary leaves, such being the slide rods, k k, and the elevators and their counter cams, or their equivalents as set forth.

I also claim the combination as well as the arrangement of one turning leaf, F, two main leaves, D D, two leg frames, one auxiliary leaf, E, and mechanism, (viz.: its rods, k, elevators, H, and their counter cams, or the equivalents thereof, for operating such leaf as described.

64,858.—MECHANICAL MOVEMENT.—William Galladay, Sheboygan Falls, Wis.

I claim the combination of the arms, C D, and pawls, E F, with the ratchet wheel, A, as and for the purpose set forth.

Connecting the arms, C and D, at their inner ends, so as to be operated by one connecting rod, substantially as shown and described.

64,859.—GIG MILLS.—Ernst Gessner, Aue, Saxony.

First, I claim the construction and arrangement of the revolving disks, D, in the adjustable frame, C, substantially as described for the purpose specified.

Second, The arms, O O', with toothed segments, in combination with the rollers, N', and disks, D, constructed and operating substantially as and for the purpose set forth.

64,860.—GATES.—Robert D. Green, Columbia, Mo.

I claim the solid bed-sill or track laid in the ground, and detached from the gate post, and on which the gate rests, plain on upper surface with groove or rail as denoted by letters, H, also pin fastener top of posts, as shown by letter, G; also the track cleaners, marked, D D, fastened to underpart of bottom rail of the gate in front of each wheel, and designed, as the gate moves, to remove from track all obstructions to the wheels, C C; also guide posts, E E, used to prevent the gate from running off the track when open.

I also claim in combination with the posts of the main gate, represented by letters, H D D C C E E, letters patent for extended top and bottom rails or slats, to be used at pleasure in forming a gap moving the gate forward on the wheels, C C, so that the gap thus formed will admit the passage of small stock, and at the same time exclude large stock.

64,861.—MANURE DRAG.—Christian H. and Joseph H. Harnly, Pennsylvania Township, Pa.

We claim the arrangement of the fork drag, A A' A'' A''', with its spring and lever, F E, clamp rod, D, and armed fork head, C B, runners, G, all combined and operating substantially in the manner specified.

In combination with the, fork-drag, figure, 1, and its ring, O, and hook, K;

we also claim the rake-drag, figure 2, when used in connection with said fork drag in the manner and for the purpose set forth.

64,862.—METHOD OF PROPELLING CARS, ETC.—Charles T. Harvey, Tarrytown, N. Y.

I claim, First, the combination of the sliding pulley, Q, with the series of teeth on the axle, by which the said pulley is made fast to the axle, and with the springs, I I', of the guide rod, D, for the purpose of stopping the motion of a car, substantially as shown.

Second, I also claim the combination of the parts, a and b, composing both a fast and loose pulley, with the springs, I I', and the axle, A, for the purpose of starting the car substantially as shown.

Third, I also claim the use in cars or other objects which are moved by propelling cables of clutches or arms whose faces that receive the impulse of sach cables are plain, substantially as shown.

Fourth, I also claim so arranging the guide rod, D, and cable clutch or arm, C, that they are compelled to rotate together while the latter is allowed to have a longitudinal movement on the former substantially as set forth.

Fifth, I also claim the combination of anti-friction rollers, z, with the cable clutch or arm, C, to obviate or prevent friction during the movements of said clutch, substantially as set forth.

Sixth, I also claim the supplementary springs, I', for strengthening and aiding the main spring, I, and so arranging and connecting them between the sides of spring, I, and the frame of the car that they are not displaced or injured by any vertical motions of the car body, substantially as set forth.

Seventh, I also claim the application to a car of bent arms, X, to hold the car down, or prevent it from being displaced from the track, substantially as shown.

Eighth, I also claim the combination of the pendulous roller, q, with the disc, p, and loose pulley, b, substantially as described.

Ninth, I also claim the combination of the bar, M, and cam, O, with the lever, J, that operates the cable clutch or arm, C, substantially as described.

64,863.—HORSE HAY FORKS.—H. H. Hatheway, Clockville, N. Y.

I claim, First, The manner of securing the tines, C, to the handle by combining with each other the caps, b and b', bolts and nuts, a a, ring, c, and handle, A, substantially as shown and operating in the manner described.

Second, The adjustable bail, D, in combination with the rings, d, keys, d2, and brace, E, substantially as and for the purpose herein shown and described.

64,864.—BEEHIVE.—B. S. and E. H. Hayland, Fort Dodge, Iowa.

We claim the arrangement in the bee box of the perforated partitions, b, and adjustable partitions, D, whereby the communication between the several compartments, C, may be opened or closed, substantially as described for the purpose specified.

64,865.—ATTACHING THILLS TO VEHICLES.—Thompson Hersee, Jr., Buffalo, N. Y.

I claim a thill coupling composed of a clip, A, so constructed as to have a chamber in its part to receive a piece of india-rubber or other elastic substance, C, and also to receive the cross head, e, of the thill iron, D, the front plate, c, of the chamber being notched or forked at its upper end and the top plate, a, of the clip over the chamber having an aperture made in it to allow the cross head of the thill iron to pass into the chamber with a projection, f, to serve as a guard to prevent the casual rising of the cross head, e, substantially as shown and described.

64,866.—CARRIAGE SPRING.—B. T. Henry, New Haven, Conn.

I claim an elliptic spring having one or more ribs, d, formed upon its surface, substantially as and for the purpose set forth.

64,867.—FASTENING FOR SHIRT COLLARS.—Frederick, Hess, Baltimore, Md.

I claim the fastener, composed of a plate with an eye on each side of it, one for holding an elastic loop to fasten the collar to the shirt, the other to hold a ring to secure the fastening to the collar as described.

64,868.—CULTIVATOR.—Jacob Hollinger, Millersburg, Ohio.

I claim the curved beam, A, as arranged in combination with the adjustable standards, B, and braces, E H, for the purpose and in the manner, substantially as set forth.

64,869.—ANIMAL TRAP.—J. W. Hollingsworth, Salem, Ind.

First, I claim the shaft, E, bearing the spring, G, eccentric, D, and double crank, H, to which are connected the rods, I, pivoted to wings, J, in combination with the rocking plate, L, supporting the pivoted levers, M, provided with stops, m3, constructed and operating in the manner and for the purpose specified.

Second, The stops, m3, in combination with the levers, M, pivoted to the rocking plate, L, arranged relatively with the shouldered eccentric, D, operating substantially as described for the purpose specified.

Third, The rod, P, provided at one end with a catch fitting into notch in the end board, F, and connected at the other end by rod, O', to lift gate, O, operated by the shouldered eccentric, D, and arranged relatively with the working parts of the trap herein described, substantially as and for the purpose specified.

64,870.—HOOP SKIRT.—William E. Houston (assignor to himself Geo. W. Hubbell and J. R. Lattin), Birmingham, Conn.

First, I claim securing the hoops to the tape by a clasp or other device inclosing the tape upon the hoop without extending through the tape, substantially as herein set forth.

Second, The combination of the cord band or other material inserted in or attached to the tape with the hoops when the hoops are attached thereto, substantially as specified.

64,871.—CLASP FOR HOOP SKIRTS.—William E. Houston (assignor to himself George W. Hubbell and John R. Lattin), Birmingham, Conn.

I claim securing the two ends of hoops by a clasp corrugated thereon diagonally and at reverse angles upon opposite sides, substantially as described.

64,872.—TAPE OF HOOP SKIRTS.—William E. Houston (assignor to himself George W. Hubbell and John R. Lattin), Birmingham, Conn.

I claim a tape formed with a longitudinal pocket, C, combined with transverse pockets, B, substantially in manner herein set forth as an improved article of manufacture.

64,873.—TAPE OF HOOP SKIRTS.—William E. Houston (assignor to himself George W. Hubbell and John R. Lattin), Birmingham, Conn.

I claim the tape formed with the thread spaces, C, in combination with the pockets, B B, substantially as and for the purpose specified as an improved article of manufacture.

64,874.—METHOD OF MAKING BALANCE WHEELS FOR WATCHES, ETC.—Edward Howard, Boston, Mass.

I claim the process or mode of making a series of balance wheel disks or buttons by the use of the crucible the brass tube and the steel rod, substantially as herein described and for the purpose specified.

64,875.—SUGAR CANE STRIPPER.—S. Terry Hudson, Success, N. Y.

I claim, First, The double pairs of springs, B B, having lap jaws, c c, for opening by each other, and varying the spaces, C C, and combination with the swivel guard plate, d, attached to the spring, D, and the stand, A, all arranged and operating substantially as and for the purpose herein described.

Second, The shifting spring, E, in combination with the springs, B B, arranged and operating as and for the purpose herein set forth.

Third, The movable stand, A, provided with the point, h, or its equivalent and the head, F, in combination with the spud, a, arranged as and for the purpose herein specified.

64,876.—WASHING MACHINE.—George R. Hughes, Centralia, Mo.

I claim the cylinder or drum, E, the bent lever, C, the lever, J, the ratchet and pawl, C, f, or tightening the cord on the cylinder or drum, F, the shaft, K, the cords, H and K, and the disk, D, constructed, arranged and operating substantially as described in combination with the frame A.

64,877.—SEED PLANTER.—D. H. Hull, Plantsville, Ct.

I claim, First, The device for operating the slides, j j, of a seed planter consisting of the lugs, m, on the slides, connecting rods, O, crank shaft, C, pinion, b, and internal gear on driving wheel, F, all combined with each other and made and operating substantially as herein shown and described.

Second, The device for raising and lowering the hinged frame, H, which consists of the chains, K, passing over the pulley, e, on the stationary arm, N, shaft, L, and ratchet wheel and pawl, h i, all made and operating substantially as herein shown and described.

Third, The frame, H, when it is provided with the seeding boxes and when it is hinged to the main axle, A, substantially in the manner and for the purpose herein shown and described.

64,878.—CULTIVATOR.—James M. Hume (assignor to himself and C. F. Hoyt), Colchester, Ill.

I claim the adjustable beams, B, arranged in combination with the frame, A, levers, K, links, L, bar, C, and single tree, M, as and for the purpose, substantially as described.

64,879.—ENVELOPE.—Ralph S. Jennings (assignor to himself and N. G. Kellogg), New York City.

I claim, First, In constructing flat envelopes cutting and folding the same to form corner wings, E E, at the ends thereof in combination with the eyelet seals, e e', substantially in the manner and for the purpose herein described.

Second, Fastening central flaps, C C, of an envelope with the double metal spars, d d, or their equivalents as and for the purpose herein specified.

64,880.—PERMUTATION LOCK.—A. W. Johnson and George Thompson, New York City.

We claim the adjustable tubes, O, of unequal length fitting over each other their outer ends provided with teeth, c, which fit into corresponding teeth in the flange, d, of the graduated adjustable rings, Q, fitting one within the other, the said tubes provided upon their inner ends with notched disks, M, the notches in the outer ring being beveled upon one side, when all are constructed, and arranged as described and operating from the yoked shaped bolt, a, provided with the spring pawl, W, substantially as described for the purpose specified.

64,881.—MOTIVE POWER.—W. B. Jones, Franklin, Ky.

I claim the combination of the inclined wheel or frame, A, cylinder, C, and lever shaft, E, when arranged together so as to operate together, substantially in the manner and for the purpose described.

64,882.—PRUNING SHEARS.—Peter Keck, Zanesville, Ohio.

First, I claim the mode of attachment of the blades of a pair of shears composed of three levers, substantially as shown and described.

Second, The combination of a convex edged cutting blade with the mode of attachment of the blades of a pair of shears, composed of three levers, substantially as shown and described.

64,883.—HORSE SHOE MACHINE.—John W. Kingsbury, New Bedford, Mass.

First, I claim the slotted arm, E, in combination with the sliding frame, F, and die, G, whereby the movement of said die is initiated substantially as herein shown and described.

Second, The adjustable rollers, H, having upper and lower plates of different diameters and thicknesses in combination with the slotted plates, g, all as herein shown and described.

Third, The combination of the adjustable block, M, or its equivalent with the reciprocating die, G, for the purpose of flattening the toe of the shoe, substantially as set forth.

Fourth, The combination of the reciprocating die, G, adjustable rollers, H, clamping jaws, I, for the purpose of forming horse shoes, all made and operating as herein shown and described.

Fifth, The adjustable block, M, or its equivalent in combination with the reciprocating die, G, and clamping jaws, I, for the purpose of flattening the toe of the shoe, all as set forth.

Sixth, The device for operating the jaws, I, consisting of the cam, o, on shaft, C, rod, n, block, L, rollers, m m, plates, l l, and springs, q q, all made and operating substantially as set forth.

64,884.—HEATING STOVE.—A. Lee, St. Paul, Minn.

I claim the deflector, E, and the vertical cylinder, D, in combination with the air cylinders, B and C, as and for the purposes specified.

64,885.—HOG HOLDER.—W. and C. Leffingwell, Clarksburg, Ohio.

We claim, First, The device for holding hogs for the purposes of wireing, ringing, or snouting, or for slaughtering or otherwise operating upon them, adjustable to the size of the hog, in manner and by the appliances, substantially as described.

Second, The hinged side, D', when combined with the hinged roofing, E E F F, or their respective equivalents, substantially as described.

Third, The inclined slat, H, or its equivalent, when combined with a box or trough, having its front opening contracted by the slats, G G', or by an equivalent construction, substantially as described.

Fourth, The rail-gate, I, or its equivalent, when combined with a box or trough having its front opening contracted by the slats, G G', or by an equivalent construction, substantially as described.

64,886.—DEVICE FOR ELEVATING ICE.—Henry Little, Middletown, N. Y.

I claim the rotatory screw elevator, in combination with the bearing, arranged to operate in the manner substantially as and for the purpose set forth.

64,887.—MODE OF DESULPHURIZING IRON ORE.—John Little, Newburgh, N. Y.

First, I claim the mode of desulphurizing iron ore by heating it in a furnace to red-hot temperature and throwing it then in cold water, substantially as set forth.

Second, The combination of processes for desulphurizing iron ore and preparing it for direct use in cupolas by heating, cooling in cold water, crushing between rollers, washing and mixing with fluxes for the reduction, to clean iron in cupolas.

Third, The furnace, A, in combination with the movable plates, S1 S2, and the hoisting gears, M1 M2, for moving these plates with the the ore, substantially as set forth and as shown in the drawing.

64,888.—HARVESTER RAKE.—John M. Long, Hamilton, Ohio.

First, I claim the rake head, I, attached to a shaft, H, on a disk, G, having an inclined axis, and arranged with a spring, J, to operate in the manner substantially as and for the purpose specified.

Second, The sleeve, F, placed loosely on the shaft, C, in connection with the clutch, L, when said parts are used in connection with the rake and beaters, in the manner substantially as and for the purpose set forth.

64,889.—Cancelled.

64,890.—CAR COUPLING.—W. H. Mayo, Hillsburgh, Nova Scotia.

I claim the draw hook, B, connected by a pin, a, to one draw-head, A, in combination with the box, D, attached to the other draw-head, C, and provided at its front part with an inclined bottom, c, the bent plate, E, lever, F, connected with plate, e, and with an arm, i, by a rod, k, and the spring, g, all arranged to operate substantially in the manner as and for the purpose herein set forth.

64,891.—CAN OPENER.—T. A. McFarland, Meadville, Pa.

I claim, as a new article of manufacture, the can opener consisting of the handle, A, and cutters, C, constructed, arranged, and operating as described, for the purpose of cutting out a disk or plug at a single blow, as set forth.

64,892.—SOLAR CHRONOMETER.—Lloyd Mifflin, Germantown, Pa.

I claim a gnomon so formed as to throw the shadow backward when the sun is fast, and forward when it is slow, to an extent equal in each case, to its variation from mean or clock time, so that the shadow of the gnomon will always cross the time scale at a point indicating the mean time, substantially as described.

I also claim correcting the variation from mean or clock time by the use of the sun's motion in his declination, north and south.

64,893.—GRINDSTONE.—Warren P. Miller, New York City.

First, I claim the mode of securing the blocks, B, to the disk, A, by means of the flange, a, and keys, C, all made and operating substantially as herein shown and described.

Second, The grooves, d d', when arranged in the grinding surface, substantially in the manner and for the purpose herein shown and described.

Third, Constructing grindstones by combining the shaft, D, and the disk, A, with the stones, B, keys, C, all made and operating substantially as and for the purpose herein shown and described.

64,894.—DOOR INDICATOR.—Francis E. Mills, San Francisco, Cal.

First, I claim the reversible box, b, provided with the lettered cover, c, having the hole, h, and the revolving disk, P, said box containing a series of letters or blank disks, S S, adapted to be placed in the sink, t, in the reverse end of said box, substantially as described for the purpose specified.

Second, The reversible box, b, in combination with the door glass plate, A, having circular opening, B, and semicircular opening, D, substantially as described for the purpose specified.

64,895.—STEAM GENERATOR.—Thomas and Thomas H. Mitchell, Albany, N. Y.

We claim the generator mounted so as to rotate on a horizontal or nearly horizontal axis, and within a furnace, substantially as described, in combination with the pipe or pipes for supplying and jetting the water, substantially as and for the purpose set forth.

We also claim the combination of the generator rotating within the furnace, the steam pipe and steam chest, and the pipe for supplying and jetting the water within the generator, substantially as and for the purpose set forth.

We also claim the combination of the generator rotating within the furnace, the pipe for supplying and jetting the water, the steam pipe and steam chest, and the blow-off pipe substantially as and for the purpose set forth.

We also claim the steam pipe attached to and rotating with the generator, and provided with apertures, when combined with the steam chest and stuffing box, so that while rotating, it will discharge the steam into the stationary chest, substantially as and for the purpose set forth.

64,896.—BOLT AND RIVET MACHINE.—John Morgan, Jr., Wheeling, W. Va.

First, I claim the construction and arrangement of the solid die, x', follower, U, header, N, and cams, D E F and I, upon the shaft, B, substantially as herein shown and described for the purpose specified.

Second, The carrier, W, knife, 10, and shield, 16, combined, arranged, and operating in the manner and for the purpose specified.

Third, The solid die, x', for forming the under side of the head of the rivet concave, as herein set forth for the purpose specified.

64,897.—BOX FOR BLUEING AND OTHER POWDERS.—George A. Moss, New York City.

I claim a box for powders, of the class specified, constructed of wood and provided with a cover of foil, or its equivalent, substantially as shown and described.

64,898.—CAR COUPLING.—John H. J. O'Neill, New Haven, Conn.

First, I claim the combination of the hook, F, the pawl, I, and lever, N, when constructed and arranged so as to operate substantially in the manner herein set forth.

Second, The head, C, constructed so as to be depressed, independent of the case, B, substantially as set forth.

Third, The arrangement of the lugs, f, or in combination with the frame, H, operating so as to relieve the spring substantially as herein set forth.

64,899.—PORTABLE BLACKING CASE.—Abraham W. Overbough, New York City. Antedated May 16, 1867.

First, I claim the arrangement and combination of blacking and polishing utensils, in the manner described, so that the case, when unfolded, forms a stand or bench.

Second, I also claim the feet, combined with the devices, in the manner so as to form an even surface when closed.

64,900.—KNITTING MACHINE.—Arthur Paget, Loughborough, Great Britain.

I claim, First, The method of and arrangement for retaining each sinker in position by a spring which also assists the action of the sinker when sinking the thread.

Second, The combination of the bars, C3 D, and the sinkers, C, when the whole are constructed and operate in connection with each other as set forth.

Third, The arrangement for drawing across the incline or other equivalent, first in one direction and then in the other, by a double grooved pulley revolving with the main shaft, and by cords or chains and weights or catch blocks, so arranged as to draw across once during a part of each revolution.

Fourth, The method of suspending the action of the drawing across motion by the employment of an incline or cam piece, so arranged that when required it can be made to lift a hinged incline piece, or other mechanical equivalent, and thus prevent the catch block entering the notch in the drawing across pulley, by which the said catch block would otherwise be carried round.

Fifth, The method of producing a selvedge in any part of the width of the frame by the employment of an incline or other mechanical equivalent attached to and traversing with the incline for actuating the sinkers or their equivalents, by which first mentioned incline the thread layer or thread layers is or are made to descend and pass between the needles at the end of each course.

Sixth, The plates, E', of steel or other hard metal, in combination with the bar, E, as described.

Seventh, The method of alternately knitting web and narrowing or widening the same, or making changes in the knitting by moving endwise in the direction of their axes the set of cams or levers employed in knitting the web, and another set or sets of cams or levers employed in effecting the narrowing, widening, or changes in the knitting.

Eighth, The method of producing by a self-acting motion, in which cams, inclines, or levers can be used, the before-mentioned endwise movements of the cams or levers, which said self-acting motion can be (without arresting the revolution of the cams) brought into operation by hand, or by tappets, or holes in an endless chain, belt, drum, or pulley.

Ninth, Each of the foregoing methods or arrangements in combination with any or all of the other methods or arrangements.

64,901.—BEDSTEAD.—Isaac Pedrick, Bridgeton, N. J.

First, I claim the frame, E F G H K, and hooks, L, or their equivalent, in combination with each other and with the posts, D, substantially in the manner herein shown and described and for the purpose set forth.

Second, The post sockets, C, in combination with the posts, D, rails, A and B, and frame, E F G H K, substantially as herein shown and described and for the purpose set forth.

Third, Stringing the slats, L, upon or connecting them with a cord or tape, M, substantially in the manner herein shown and described and for the purpose set forth.

64,902.—CARD HOLDER.—Henry H. Pember, New York City.

I claim the card holder consisting of rectangular piece of metal, B, having a flange, a, along the edges of the two ends and its lower side, D, the upper side left open and provided near its center with the catch, E, and perforated ear pieces, F F, when all are constructed of one piece of metal, as herein set forth.

64,903.—MACHINE FOR SWAGING HORSESHOE BLANKS.—Chas. H. Perkins and Richard W. Comstock, Providence, R. I.

We claim the combination of the vibrating swaging bar, C, operating as described, with the stationary bar, A, for swaging the heels or horseshoe blanks, substantially as described.

64,904.—BOLT HOLDER.—Bacchus Perry and Aaron Cornish, Lee, N. Y.

We claim the bolt holder constructed and operating substantially in the manner and for the purpose herein described.

64,905.—CULLENDER BOILER.—Benj. F. Porter, Manchester, N. H.

First, I claim the perforated boiler, A, with double-L-shaped slots, a, resting wires, b, and movable bottom constructed as described, and operating in the manner as and for the purpose specified.

I also claim the divider, E, in combination with a culinary boiler of any kind, when constructed and used substantially as described for the purposes specified.

64,906.—GANG PLOW.—L. O. Rockwood, Ottawa, Ill.

I claim the adjustable extension joint, fig. 4, constructed substantially as and for the purpose described in the foregoing specification.

64,907.—TRUNK.—Columbus A. Rose, Columbus, Ga.

I claim a trunk provided with a triangular hinged portion, B, and internal doors or lids, E, capable of being employed as shelves, substantially as described.

64,908.—SKATE FASTENING.—Duane A. Ross, New York City.

First, I claim the combination of the screw rods, a b, with the sole and heel clamps and with the thumb nuts, e k, for the purpose of fastening or detaching the skate to or from the boot or shoe, substantially as described.

Second, I also claim incasing the screw rods, nuts, and curved arms substantially as herein described, to prevent them from injury by snow, ice, water or other causes, substantially as described.

Third, I also claim hinging the clamp plates, n, to the clamp arms, d, for the purpose of adapting the clamping surface to the varied shapes or tapers of the heels of boots or shoes, substantially as described.

64,909.—COTTON AND HAY PRESS.—J. G. Roux, Raymond, Miss.

I claim the independent screws, B, having the same pitch but reverse motion, having pinions, E, on their inner ends, operated by the same pinion, D, operating in combination with the nuts, G, and braces, F, substantially as described for the purpose specified.

64,910.—HANGING AND LOCKING SASH—Charles A. Schaefer (assignor to himself, Fritz Frillman, Wm. Wolff and John Schachtschober), Chicago, Ill.

I claim the half-round locking stud, I, in combination with a rack, J, and pinion, F, to lock a window sash at any desired point, substantially as set forth.

64,911.—SASH SUPPORTER.—Charles A. Schaefer (assignor to himself, Fritz Frillman, Wm. Wolff and John Schachtschober), Chicago, Ill.

I claim the combination of the screw cylinder, A, shank, C, spring, I, and fork, c, with the roller, d, substantially as and for the purpose set forth.

64,912.—SEED SOWER.—Elijah U. Scoville, Manluis, N. J.

First, I claim having two or more hoppers, E, within one seed box, D, substantially as and for the purpose herein shown and described.

Second, The grooved roller, F, when arranged below the hoppers and when provided with adjustable slides, e e, by which the amount of the seed discharged is regulated, substantially as set forth.

Third, The revolving spreader, G, when provided with perforated wing, I I, substantially as and for the purpose herein shown and described.

Fourth, The perforated wings, I I, when arranged in zig-zag lines upon a revolving shaft, G, substantially as and for the purpose herein shown and described.

Fifth, The hoppers, E, when arranged in a seed box, D, which is supported by braces, b, in combination with the spring, c, and screw, a, and roller, F, substantially as herein shown and described.

Sixth, The grooved roller, F, in combination with the rubber scrapers, h, which are secured in that side of the hoppers, E, towards which the seed is carried by the roller, as set forth.

Seventh, The zig-zag perforated revolving spreaders, in combination with the grooved roller, F, and hoppers, E, all made and operating substantially as herein shown and described.

64,913.—TIP-CART BODY FASTENING.—John E. Seavey, Kennebunkport, Me., assignor to himself and S. E. Bryant.

I claim the cart body fastener made substantially in the manner and for the purpose and to operate as specified, it being composed of the weighted arm, A, the eccentric, b, the yoke, B, and the bearing, C, formed and arranged as explained.

64,914.—PLOW POINT.—David J. Selden, Mount Vernon, Ohio.

I claim the wrought-iron tenon cast in the cast iron share with shoulders on each of the four sides of the tenon, the point with the mortise to fit the wrought-iron tenon with either side of the point up and with the back end of the point of the same size and meeting the shoulders on the cast-iron share. The countersunk hole through the mortised point and the wrought-iron tenon with the pin passed through the hole to keep the point to its place on the tenon and the split point of the pin so sprung as to keep it in its place and to hold the point to its place on the tenon with either side up.

64,915.—HOISTING GEAR.—H. F. Shaw, West Roxbury, Mass.

First, I claim the combination as well as the arrangement of the ring gear, H, and spur gear, D, operating as described and for the purpose set forth.

Second, The combination of the ring gear, H, with the lever, K, made substantially as described and for the purpose set forth.

64,916.—MANUFACTURE OF IRON AND STEEL.—Lorenzo Sibert, Mount Solon, Va.

I claim the improved method of manufacturing iron and steel, substantially as herein described.

64,917.—GARDEN CULTIVATOR.—George W. Smith, Mount Olivet, Ky.

I claim the cultivator in its combined form having a number of tools, E F F G G H, easily detached for separate use and capable of combined use, substantially as described.

64,918.—CAR COUPLING.—J. Smith and J. F. Irwin, La Porte, Ind.

We claim the slide, D, the pinion, E, the coupling pin, B, and the shaft, F, constructed, arranged and operating substantially as herein shown and described, in combination with the draw head of a railroad car, for the purposes set forth.

64,919.—CORN SHELLER.—E. E. Stedman, Randolph, Ohio.

I claim the jaws, C, springs, E, as arranged in combination with the case, A, for the purpose and in the manner described.

64,920.—TEMPORARY RUDDER.—H. L. Stibbs, Savannah, Ga.

I claim the combination of the chains, D, or their equivalent, and branched or forked hinge-straps, C, with the body of the rudder, B, substantially as herein shown and described and for the purpose set forth.

64,921.—CAR COUPLING.—W. A. Stowell, Moretown, Vt.

I claim the combination of the yoke, E, holding the coupling pin, F, bumper head, A, having two mouths, bent lever, I, and pivoted hook, H, substantially as described for the purpose specified.

64,922.—ADJUSTABLE ECCENTRIC.—James B. Strickland, Scranton, Pa.

I claim the combination and arrangement of the collar and arm, B C, and the eccentrics, E F, substantially as herein shown and described for the purpose set forth.

64,923.—GANG PLOW.—J. W. Sursa, San Leandro, Cal.

First, I claim the combination and arrangement of the shaft, c, the segment arms, d d', the axles, g g', of the wheels, D D, the hand lever, h, and the rack, k, for raising and lowering the gang plows, A A, substantially as herein described.

Second, The arrangement of the draft pole, F, pivoted to the plow beams, B B, and depressed and elevated by the screw, s, substantially as and for the purpose set forth.

64,924.—GATE.—Jacob Vail (assignor to himself and John H. Linderman), Beloit, Wis.

First, I claim the arrangement of the cords, H and I, and pulleys, J L O P, with each other and with the gate, B, for the purpose of opening and closing said gate, substantially as herein shown and described.

Second, Making one of the horizontal boards or bars of the gate act as a sliding latch, substantially as herein shown and described and for the purpose set forth.

Third, The combination of the coiled spring, E, or its equivalent, with the sliding bar, b', substantially as herein shown and described.

Fourth, The combination of the pivoted lever, T, with the gate, B, sliding bar, b', and operating cords, H and I, substantially as herein shown and described and for the purpose set forth.

64,925.—ATTACHING BURNERS TO LAMPS.—H. Weston, Towanda, Po.

I claim providing the interior of the collar, C, with a screw and having the exterior of the projection, B, covered with a packing, a, of leather or any suitable cement or composition, with set screws, c, passing through the collar, substantially as and for the purpose set forth.

64,926.—PLANTER AND MANURE DISTRIBUTOR.—Benjamin F. Whitner, Madison, Fa.

I claim the combination of the furrow opener, q, the furrow wheel, A, and the covering drag, D, with each other and with the planting cylinder, C, and the seed receptacle, B, substantially in the manner and for the respective purposes herein set forth.

I also claim the grooved planting cylinder, C, when it is combined with a jointed and a recessed ring, i, and when the said cylinder works in combination with the furrow opener, q, the furrow wheel, A, and the covering drag, D, substantially in the manner herein set forth.

64,927.—SHOVEL PLOW.—Albert Wilcox, Maquoketa, Iowa.

I claim the attachment of the third shovel, A, by means of the curved supporting bar, B, to the beam, C, of the main plow, also the manner of equalizing the draft of said plow by making the left-hand standard of the main plow more curved and the shovel on the same a size larger, in the manner and for the purpose above set forth.

64,928.—EGG BEATER.—Marvin T. Williams, Milwaukee, Wis.

I claim, propeller blade, M, beating arms, L, shaft, I, pinion, F, cover, H and cog wheel, D, arranged and combined substantially as and for the purpose described.

64,929.—STEAM GENERATOR.—Joseph Woodruff, Rahway, N. J.

First, I claim the connection of two boilers by means of the pipes, D D, substantially as described.

Second, I also claim extending the tubes, D D, a nozzle into the boiler and bending or deflecting the same, for the purposes substantially as set forth and described.

64,930.—CAR SPRING.—Henry A. Alden, Matteawan, N. Y.

I claim, in a spring composed of one or more pairs of concavo-convex, or conical and radially corrugated plates as described interposing between the plates of each pair a disk of vulcanized rubber, or other elastic body of suitable dimensions, substantially in the manner and for the purposes set forth.

64,931.—BRACE FOR BITS.—Charles H. Amidon, Greenfield, Mass.

I claim the combination of the clamping stirrup, B, and shoulder, G, in the shank of a bit brace, for the purpose set forth.

64,932.—CLOTHES WRINGER.—Charles H. Amidon, Greenfield, Mass., assignor to the Bailey Washing and Wringing Machine Company, Woonsocket, R. I.

First, I claim the cog wheels, C D E F, connected together at their axles by the straps or links, a e f, so as to form a flexible train of gearing between and in combination with the rollers B B, of a clothes wringing machine, substantially as and for the purpose set forth.

Second, The levers, H H, arranged substantially as set forth to be in opposition to a resisting force exerted by a spring or springs, or their equivalent.

64,933.—COFFER DAM AND BOAT.—William H. Applegate, Le Claire, Iowa.

First, I claim the construction and arrangement of a floating coffer dam and boat combined having the water-tight compartments and provided with the series of frames arranged to support the planking, substantially as herein shown and described.

Second, In combination with a combined coffer dam and boat constructed as described, I claim the shafts, A and F, and the carrier or endless belt, D, for removing material from within the dam, substantially as set forth.

Third, I claim the construction and arrangement of the boat with an opening at its rear end, substantially as described.

64,934.—SEPARATING ZINC FROM GOLD AND SILVER.—Edward Balbach, Jr., Newark, N. J.

I claim a movable black-lead retort formed with a neck and introduced within a furnace, substantially as set forth, for receiving gold, silver, lead, and zinc alloys and distilling off the zinc, the remaining alloy being poured out by inclining the retort, as set forth.

64,935.—MACHINE FOR WIRING BLIND SLATS.—Peter Barry, Newark, N. J.

I claim, First, The independent cut-off, F, arranged to operate upon the staples by coming between them from above, substantially as described.

Second, I also claim the independent cut-off in combination with the guides, e e, which guide its free end to the guide strip, B, substantially as shown.

Third, I also claim the combination of the elbow lever, S, the slot, F, the pawl, L, and the adjusting shoe, M, substantially as shown.

Fourth, I also claim in combination with the feeding pawl, L, the adjusting shoe, M, and the feeding bar or rack, substantially as shown.

Fifth, I also claim the application of a spring plate, R, to the feeding mouth or space below the plunger, when arranged and combined with a rigid or unyielding guide strip, B, substantially as set forth.

64,936.—ATTACHING CARRIAGE THILLS.—A. R. Bartram, Redding, Conn.

I claim, First, The adjustable coupling, A, in combination with the cross bar, C, substantially as set forth.

Second, The tang, B, of the coupling, A, provided with a groove, as set forth, in combination with the socketed cross bar, C, and the set screw, E.

64,937.—LIFTING JACK.—J. H. Bean, Marietta, Ohio.

I claim the lever, E, and serrate bars, C C', both the latter working in the vertical passages, B B', for greater security, in combination with the levers, F F', and detents, G G', and springs, b b', the detents pivoted to the levers and operating at right angles to the said bars, substantially as described.

64,938.—LATHE.—William B. Bement, Philadelphia, Pa.

I claim, First, The combination of the spindle, C, its two overhanging ends, driving wheel or pulley, F, and bearings, B B, the whole being arranged substantially as and for the purpose herein set forth.

Second, The combination of the said spindle and its two overhanging ends with the bed, b, carrying two slide rests when the said spindle can be adjusted from and towards and in a direction at right angles to the said bed, b.

Third, The said spindle, C, its adjustable bearings, B B, and its cog wheel, F, in combination with the adjustable arms, I I, and the gearing herein described, or its equivalent.

Fourth, The combination of the two slide rests, the two screw shafts, m and m', for operating the said rests, the driving pinion, n, and the two clutches, p and p'.

64,939.—LIFE PRESERVER.—John M. Billhofer, Irvington, N. Y.

I claim the double cone-shaped frame, A, provided with the bag, B, and jaws, C, substantially as and for the purpose shown and described.

64,940.—OSCILLATING ENGINE.—William E. Bird, New York City.

I claim the combination in steam or other oscillating engines, with the trunion of the engine cylinder of a reciprocating slide valve working against a fixed or stationary seat and operating to control the ports or passages of the engine, substantially as described.

64,941.—COMBINED BACK SIGHT AND CARTRIDGE RETRACTER FOR FIRE-ARMS.—G. W. Bowlby, Pontiac, Mich.

I claim the sight, F, constructed and used in combination with the barrel, A, for the purpose of forming a sight and retractor at the same time, substantially as specified.

64,942.—CARRIAGE TRIMMING.—Charles Bried, Newark, N. J.

I claim rubber or gutta-percha tubes, sleeves, or rings or compounds of gum elastics when made and used in the forms and for the purposes hereinabove designated.

64,943.—HEATING STOVE.—Albert Brown, Troy, N. Y.

I claim, in connection with the combustion chamber of base burning stoves, the arrangement of a fuel reservoir or supply chamber, C, directly under an oven, B, substantially in manner as herein described and for the purpose set forth.

64,944.—WARP EYES OF WIRE HEDDLES FOR LOOM HARNESS.—Darius C. Brown, Lowell, Mass.

I claim my improved heddle eye made substantially as described, that is, of wires or parts of a wire twisted together and subsequently spread laterally at the angle or angles of junction, in manner substantially as set forth so as to tighten the twist at either or both ends of the eye, as and for the purpose as hereinbefore explained.

64,945.—GATE.—John A. Burchard, Beloit, Wis.

I claim an improved farm and carriage gate when constructed and operated substantially as set forth and for the purpose specified, in combination with the vault, O O, weight, C, lever, D, pulleys, E E, tracks, Q Q, cords, e f, latch, b, pulleys, H H, posts, A A G G, and platform, P.

64,946.—LIFTING JACK.—Charles Butterworth, Miamisburg, Ohio, assignor to himself and Jacob Kercher.

I claim the combination and arrangement of the uprights, A and B, the lever, E, with its fulcrum roller, n, and the supporting pieces, F, constructed substantially as described and for the purpose specified.

64,947.—APPARATUS FOR ACCUMULATING AND RECLAIMING HEAT.—Thos. J. Chubb, Brooklyn, N. Y.

I claim, First, The employment in a chamber or chambers of a series of tubes arranged in such manner that the exterior surfaces of said tubes are exposed to or are in communication with the waste heat passages in the chamber in which said tubes are arranged and the space or passages between the tubes in said chamber are in communication with the chamber of combustion, and also to and with the passages leading to the chimney and the interior of said tubes or passages therethrough, are in communication with a separate chamber or passage leading from the gas generating furnace to and through the interior of the said tubes to the chamber of combustion, when the foregoing is combined with substantially a similar chamber, series of tubes, spaces, passages, and communications, the interior of such latter series of tubes being in communication with the passage leading from the open air to and through the interior of said tubes to the chamber of combustion, substantially as described.

Second, The combination in or with a gas generating furnace of a chamber or chambers containing a series of tubes made hot by the waste heat produced by the combustion of gas and air heated in these passages as separate currents to the place of combustion in a direct or continuous manner by opposite surface action or passage of the heat through the material of which said tubes are composed, substantially as described.

Third, The employment of a series of tubes so arranged that they may be heated by the products of combustion produced by the mingling together of heated air and gas when said air and gas have been heated by heat communicated through the material of which the said tubes are composed, substantially as described.

Fourth, The employment of a chamber or chambers containing a series of tubes so arranged as to present an extensive caloric absorbing surface and conducting heat through the material of which said tubes are composed and communicating it to and heating a current or currents of air and gas or gases passing on or over the opposite side of the said tubes.

Fifth, Constructing chambers with a series of tubes for the entrance of continuous currents of air and gases for supporting combustion in a separate chamber, which currents are heated by waste heat or the products of combustion of such heated currents passing in opposite directions or nearly opposite directions and on opposite sides of said tubes and through the material of which they are composed, for the purposes specified.

Sixth, Making provision for heating air and reheating gas in their passage to a chamber of combustion by the heated products resulting from combustion in said chamber when said gas, air, and heated products flow through their respective passages without requiring reversal, substantially as specified.

64,948.—COMBINED GRAIN THRASHER AND CLEANER.—Adrian Cornell, Newtown, Pa.

I claim, First, The combination substantially as described of the thrashing cylinder, the double vibrating shaker, the fan, and the shaking shoe, when arranged for joint operation as set forth.

Second, The detachable shoe frame, R, constructed and arranged as described.

Third, The combination of the shaker, the shaking hopper and the riddle, arranged for joint operation as described.

Fourth, The combination of the driving shaft and pulleys with the cylinder shaft and pulleys and the pulleys on the fan shaft, arranged and operating as described, for the purpose of adapting the machine to use with either an undershot or overshot horse-power without crossing the belts.

64,949.—LIFTING JACK.—Charles Crow, Onargo, Ill.

First, I claim the arrangement and combination of the movable steps, I, racks, D, and guides, B C, when constructed to operate substantially as and for the purpose set forth.

Second, The combination of the roller, H, rope, E, pulley, J, inner guides, C, and drum, v', when arranged substantially as and for the purpose described.

64,950.—CHURN AND PUMP POWER.—Francis Danzenbaker, Bridgeton, N. J.

I claim the pendulums, B and K, and their attachments, lug, C, shaft, D, and arms, G and F, when arranged to operate both a churn and pump, either separately or combined, substantially as set forth.

64,951.—MACHINE FOR APPLYING ANIMAL POWER.—Jonathan Dearborn, Seabrook, N. H.

I claim the combination and arrangement of the inclined shaft, A, the wheel, C, the guard, E, and the platform, G.

I also claim the combination of the shaft, A, the wheel, C, the guard, E, the fender, D, and the platform, G.

I also claim the combination of the beveled gears, H I, the shaft, K, the shaft, A, the wheel, C, the guard, E, and the platform, G, the whole being arranged so as to operate as specified.

64,952.—HOOPS FOR SKIRTS.—L. De Forest, Birmingham, Ct.

I claim protecting the hoops of hoop skirts by a succession of metallic clasps or spangles, in the manner and for the purpose substantially as herein set forth.

64,953.—SAW.—Charles Disston, Philadelphia, Pa.

I claim an elastic detachable forked key, C, constructed and adapted to the retention of a detachable saw tooth, substantially as specified.

64,954.—PROCESS OF TREATING STEEL BLADES, ETC.—Henry Disston, Philadelphia, Pa.

I claim the within described mode or process of treating blades or other thin pieces of steel, that is to say: straightening and condensing them by impact or pressure immediately after they have been reduced to the desired temper, and while they are still hot, as described.

64,955.—CARRIAGE WHEEL HUBS.—L. Dorman, Worcester, Mass.

First, I claim the combination of the grooved wooden part, A, with the metal shell, B, substantially as and for the purposes set forth.

Second, The combination of the grooved wooden center or core, A, and the spokes, E, with the slotted or metal shell part, B, substantially as and for the purpose set forth.

64,956.—AUTOMATIC LUBRIBATOR.—Isadore Dreyfus, New York City.

I claim an automatic lubricator, constructed to be applied as described provided with a loose rod or dasher, set in motion by the journal for conducting the lubricating material thereto, substantially as specified.

64,957.—SASH PULLEY.—Simon Drum, Allegheny City, Pa.

I claim a shell for a sash pulley, said shell being made in halves and without a face piece, and so arranged that the openings for the screws are divided by the line of separation between the halves of said shell, whereby one half of each opening for the screws are cast in the ends of each half of the shell, the whole being constructed, arranged, and operating substantially as herein described and for the purpose set forth.

64,958.—SUPPORT OR BEARING FOR FRICTION ROLLERS.—Stephen W. Eaton, Farrington, Me.

I claim the box, A, constructed substantially as specified, viz.: with the elongated recesses or notches, a a, to receive the journals of the roller, B, and so made as to enable the roller to rest on the base plate, c, of the box, and roll thereon a short distance in either direction from the middle of the plate, as described.

64,959.—WOODEN PAVEMENT.—Henry Fayette, Port Chester, N. Y.

First, I claim the sections of pavement composed of a number of wooden blocks, bolted together longitudinally and transversely, substantially as described.

Second, In sections of pavement composed of wooden blocks, bolted together as described, I claim making the blocks in the outer tier of each section longer than the central blocks, as and for the purpose described.

64,960.—WOODEN PAVEMENT.—Henry Fayette, Port Chester, N. Y.

First, I claim locking together sections of wooden pavement by means of tongues and grooves, so arranged that each section will be supported by every adjoining section, substantially as described.

Second, I also claim sections of pavement, composed of wooden blocks bolted together as described, and provided with tongues and grooves so arranged that when laid down in a pavement each section will be locked with all the adjoining sections by means of said tongues and grooves, substantially as described.

64,961.—DEVICE FOR LUBRICATING WHEELS, ETC.—John C. Fish, Barnstable, Mass.

I claim a lubricating apparatus constructed of a reservoir, in which is located the tube, c, provided with openings as described, and with a perforated movable tube, i, operating substantially as described.

64,962.—MARINE FURNITURE.—Josiah Foster, Sandwich, Mass.

I claim a construction of movable furniture for vessels such that by means of packed joints, arranged and operating as set forth, it can be transformed into boats, substantially as described.

64,963.—MACHINERY FOR MAKING NAILS.—Thaddeus Fowler, Seymour, Conn., assignor to the Fowler Nail Company, New Haven, Conn.

First, I claim moving the rod of blanks forward and adjusting successively each blank to its proper position before the dies bite upon it, by means of the lateral flanges, o s, arranged and operating in the manner herein described.

Second, I claim combining with devices for feeding the nail blanks, the two pairs of cutters, b and m, and l and n, arranged substantially as described.

Third, I claim the combination of the cutters, h and m, l and n, with the rollers, d and e, formed with cam-shaped surfaces, l, and flanges, o and s, as and for the purposes specified.

64,964.—MACHINE FOR MAKING HORSE-SHOE NAILS.—Thaddeus Fowler, Seymour, Conn., assignor to the Fowler Nail Company, New Haven, Conn.

First, I claim the jaws, n n, fitted and actuated substantially as specified, to straighten the nail by pressure on its edges, as set forth.

Second, I claim the die, p, in combination with the carrier plate, h, for acting upon the side of the nails as brought around successively, as specified.

Third, I claim the cutter, q, in combination with the carrier plate, h, for clipping off the nail points as successively presented by said carrier plate, h, as set forth.

Fourth, I claim the spring friction plate, t, in combination with the carrier plate, h, and a file for removing the side of the point, substantially as specified.

64,965.—LAMP BURNER.—John A. Frey, New York City.

I claim the combination of the air chambers, f and g, with the air inlets, d d, and perforated diaphragm c arranged and operating as and for the purpose set forth.

64,966.—MACHINE FOR SIZING AND FELTING HATS.—E. R. Gardiner, Brooklyn, N. Y.

I claim the combination with the inclined endless belt or apron, C, of the inclined adjustable or self-adjusting partly submerged bed, F, and box or bath, A, substantially as and for the purpose or purposes herein set forth.

64,967.—GANG PLOW.—T. Elzare Gardiner, Bryantown, Md.

I claim a gang plow, constructed and operating in the manner substantially as shown and described.

64,968.—GUIDE FOR SEWING MACHINES.—George D. Garvie, Hartford, Conn.

I claim the adjustable gage, B, in combination with the spring arm, a, both being constructed and arranged as described.

64,969.—ATMOSPHERIC CHURN DASHER.—J. C. Gaston, Cincinnati, Ohio.

I claim the tubular handle, A, provided with the perforation, b, near the upper end, a, in combination with the dash board, c, having the annular concavity, c', in its lower face, all constructed and operating substantially as herein described and for the purpose set forth.

64,970.—BRIDLE REIN.—A. E. Graham, Richland, Ind. Antedated November 21, 1866.

I claim the continuous reins, A A, passing through pulleys on the ends of the bit, and also through pulleys each side of the gag rein, and around the terret or check hook, being tacked together (as seen at x), or prevented by a keeper from sliding through said check hook, substantially as described and for the purposes herein specified.

64,971.—CHURN.—Adelbert W. Gray, Bennington, Ohio.

I claim the special arrangement of the break, C, in combination with the heater, H, when operated conjointly, in the manner and for the purpose set forth, by means of the band, I, pulley, K, and wheel, J.

64,972.—RECIPROCATING ENGINE.—William D. Grimshaw, Newark, N. J.

I claim the combination, with a reciprocating piston, of a cushioning attachment, operating as a sliding or movable plug to the port or ports of the cylinder, substantially as specified.

64,973.—BED BOTTOM.—C. H. Hall, Binghampton, N. Y.

I claim the arrangement of a series of springs, C, each having three or more coils, which are placed on pins, D, and on the end of the slats, B, substantially in the manner and for the purpose shown and described.

64,974.—PLOW.—H. G. and E. L. Hall, Putnam, Ohio.

We claim, First, The detachable side plate, B, of the plow point, A, substantially as and for the purpose specified.

Second, The cutting point, C, composed of a wrought-iron shank, c, and a cast or chilled-iron cap, c', substantially as and for the purpose described.

Third, The method above described of attaching the side plate, B, to the plow joint, A, by means of shouldered pins, b' b', projecting from the side plate, B, into slots in the body of the plow point, where the shoulders of the pins rest on ledges or keys in the walls of the slots, substantially as and for the purpose specified.

Fourth, The method of attaching the shank, c, to the plow point, A, above described.

Fifth, The independent cutter or coulter, H, substantially as and for the purpose described.

Sixth, The construction of the cutting point, C, and the groove or bed, a, as above described, so that the cutting point may be self-sharpening, substantially as and for the purpose specified.

64,975.—DOOR LOCK.—W. J. and J. W. Harris, Newport, N. Y.

We claim, First, In combination with the key for arranging the tumblers, the eccentric or slide for moving the lock bolt, substantially as described.

Second, In combination with the slide, the stops against which it impinges or brings up at the exact point in both the locked or unlocked positions for the admission and withdrawal of the key, substantially as described.

64,976.—WINDOW-SASH WEIGHT.—H. A. Harvey, New York City.

I claim the new article of manufacture herein described, namely, a sash weight, composed of a metallic case filled with iron ore and cement, manufactured as herein set forth.

64,977.—TURBINE WATER WHEEL.—Birdsill Holly, Lockport, N. Y.

I claim sustaining turbines and other wheels by means of a water chamber, H, and disk, F, resting directly upon the sides thereof, both surrounding the step and snait of the wheel when supplied with water from the flume, and proportioned to the light thereof, substantially as set forth.

I also claim, in combination with said device, the supply pipe, I, arranged for receiving the water from the outside of the stop gate, J, substantially in the manner and for the purpose set forth.

64,978.—DEVICE FOR PERFORATING CIGARS.—J. Houghton, New York City, and G. Wingfield, Brooklyn, N. Y.

We claim, First, The combination of the needles, a, head, A, casing, B, spiral spring, b, ring, d, and piece, C, substantially as and for the purpose set forth.

Second, The combination with the head, A, and needles, a a, with the casing, B, substantially as and for the purposes set forth.

Third, The combination with the head, A, and needles, a a, of the conical piece, C, having a trumpet-shaped or conical opening in it, substantially as and for the purpose specified.

Fourth, The combination with one or more needles, a a, head, A, and casing, B, of the spiral spring, b, substantially as and for the purpose set forth.

64,979.—BROOM HEAD.—William G. Hughes, Hebrow Ind. Antedated May 8, 1867.

I claim, First, The combination of the wire braces, I and J, with the parts, A and B, and with the brush of the broom, substantially as described and for the purpose set forth.

Second, The combination of the spring or bracing wires, M and N, with the wire braces, I and J, and the brush, P, substantially as described and for the purposes set forth.

64,980.—TOBACAO CUTTING MACHINE.—W. W. Huse, Brooklyn, N. Y.

I claim arranging or hanging the circular cutter eccentrically upon its shaft, so that only a portion of its cutting edge is at one operation brought into action on the tobacco or other material to be cut, and when desired, can be shifted on its shaft to bring another portion of its cutting edge to act on the substance to be cut, as described.

I also claim making the cutter for a short distance from its periphery or cutting edge, inclining outward from the plane of motion as herein described in combination with the method of hanging the cutter eccentrically and so that it can be shifted on its shaft as described.

And I also claim in combination with the eccentric cutter, the employment of a sharpener and wiper, arranged substantially in the manner and for the purposes set forth.

64,981.—SEEDING CULTIVATOR.—Henry Hutchison, Three Rivers, Mich.

First, I claim the reversible cross shaped marker, O, constructed, arranged and operating as described.

Second, The reversible rhombohedral spades, R, constructed, arranged and operating as described.

Third, The reversible winged covering plows, U', constructed, arranged and operating as described.

Fourth, Adjusting and holding the shades upon the legs or shovel stocks by means of the hinged clamps and set screws, constructed and arranged as described.

Fifth, The combination of the hinged slotted legs with the pivoted drag bars having hooks on their rear ends to pass through the slots and be held by wooden pins behind the legs when constructed, arranged and described.

Sixth, The combination of the marker and front plows with the shifting bar, P, shifting lever, P', and drivers seat, when arranged for joint operation as set forth.

Seventh, The combination of the legs with their supporting beams by means of the laterally adjustable sockets, forks, lugs, and set screws, constructed, arranged and operating as described.

Eighth, The combination substantially in the manner described of the front and rear plows mounted on opposite ends of levers pivoted to rock transversely, to the axle to relieve the strain on the plows caused by inequalities in the surface of the ground.

Ninth, The combination of a series of front and rear plows with longitudinal rocking levers fulcrumed on transverse levers so connected at their inner ends that the levers can simultaneously be raised or lowered by the driver or be held in any position desired.

Tenth, The combination of the covering plows attached to the beam suspended from the rear end of the rocking levers with the lateral vibratable front plows suspended from the front end of the rocking levers.

Eleventh, The combination of the lifting levers, sliding bar, V, and detent, v, when arranged in relation to the drivers seat, substantially in the manner described.

Twelfth, The arrangement of the adjustable drivers seat, arched bar and adjustable back brace as described.

Thirteenth, The arrangement of the hoppers, E' and F, as and for the purpose described.

Fourteenth, The combination with the feeding hopper, E', of the reciprocating teeth, m, and rubbers, m', for the purpose of separating the seed.

Fifteenth, The combination with the lower hopper of the reciprocating toothed feeding slides.

Sixteenth, The vertically reciprocating gates, J, arranged and operating as described.

Seventeenth, The combination substantially in the manner described of a hopper, a horizontally reciprocating toothed slide and a vertically reciprocating gate.

Eighteenth, The combination of the hopper the reciprocating slides, the feed spout and the marker, for the purposes set forth.

64,982.—STATIONARY WASH BASIN.—Alfred Ivers, New York City.

I claim the pendant flange, d, and slot, e, in combination with the dam, l, and pipe, g, substantially as and for the purposes specified.

64,983.—SHEEP RACK.—Heber G. Ives, Dunham, Conn.

First, I claim pivoting the hay rack of a sheep feeding device so that by adjusting or turning the same, the trough beneath may be exposed to facilitate cleaning, substantially as described.

Second, I claim the combination with the racks, C C, of two troughs, F F, having their contiguous inclined sides joined together at top at an angle for the purpose of distributing the grain or roots, substantially as set forth.

64,984.—HARVESTER.—Luman H. and George J. Jones, Barrington, N. Y.

We claim the arrangement of the several parts, B C D E G J K L and M when made and applied as and for the purposes herein specified.

64,985.—HARVESTER PITMAN.—Jacob L. Kintner, Harrison county, N. Y.

I claim the grooved adjustable journal boxes, B B, frame, A, and packing, E F, combined and arranged with the cutter bar, D, pitman, E, and wrist pin, C, in the manner and for the purposes herein specified.

74,986.—ORGAN.—George B. Kirkham, New York City.

First, I claim the connections, a a, their nuts, screws, and blocks, d e, together with their pin screws, and little ball supports, c.

Second, I claim the lips. f f, and their guides, g g.

Third, I claim the spring catch, h, and its attachments, i j k l m n and o, including the arrangement, p and q.

Fourth, I claim the bar, b, and its supports, b' b' as shown and set forth.

Fifth, I claim the combination, s r t u v, as described and represented.

Sixth, I claim the peculiar hinge joint made by the sticks, T Y and Z, with little pins passing through the sticks.

64,987.—GATE.—Albertus Larrowe, Cohocton, N. Y.

I claim the combination and arrangement of the gate, as herein described, with the post, C, having the rabbets, e e, and roller, g, and post, B, with slot and catch, t, in the manner and for the purposes set forth.

64,988.—WINDOW-SASH ELEVATOR.—John Le Ferre, Charlestown, Mass.

I claim the hinged plate, C, with its projections, a, eyes, c d, and screw, D, in combination with the block, G, provided with its screw thread, f, and carrying the pulley, e, substantially as and for the purpose set forth.

64,989.—TIME GLOBE.—L. Paul Juvet, Glenn's Falls, N. Y.

First, I claim the axis of the globe, A, when constructed of the two sections, F and F', the former serving as an axis for the hollow arbors, o and p, carrying the hour and minute hands, d and b, and the latter serving as a winding arbor, constructed, arranged, and operating in the manner substantially as shown and described, and for the purpose set forth.

Second, The combination of the dial, D, globe, A, and the chronometer movement within the same, arranged, constructed, and operating in the manner substantially as shown and described and for the purpose set forth.

64,990.—MODE OF AGEING ALCOHOLIC LIQUORS.—Joseph Lloyd Martin, Baltimore, Md.

I claim, First, The process herein described for changing, altering, and modifying whiskey, brandy, gin, or other alcoholic liquors, so as to give them the character and quality of similar liquors as usually acquired by long keeping.

Second, The combined action of heat, electricity, and attrition, so as to modify and change alcoholic liquors, substantially as herein described.

Third, The combination of an electric battery, pump, and tanks, or their equivalents, so as to treat alcoholic spirits, substantially as herein described.

64,991.—SHEEP SHEARS.—Ebenezer Mathers, Elderville, Pa.

First, I claim making sheep shears with reversable blades for cutting or clipping whether each blade or set of blades be made in one piece or in two or more pieces, substantially in the manner and for the purposes above set forth.

Second, The mode of attaching the handles, a a', of a pair of sheep shears by a spiral or coiled spring, b, so as to admit of their easy operation, such spring possessing sufficient rigidity to cause the return stroke of the blades, substantially as and for the purposes hereinbefore set forth.

Third, Securing a more or less intimate contact between the opposite blades or sets of blades of a pair of sheep shears, by a set screw passing through a slot in one of the blades or the plate to which such blade is attached, and screwing into the other, substantially as and for the purposes above described.

64,992.—INSTRUMENT FOR PREVENTING INCRUSTATION OF STEAM BOILERS.—David Matthew, Prairie du Chien, Wis.

I claim the employment within the boiler or cage or case, containing metallic scrap, substantially as described.

64,993.—HEATING APPARATUS.—T. A. McFarland, Meadville, Pa.

First, I claim the combination substantially in the manner described, of the fire chamber, the water chamber, and the steam chamber, with the casing or body of the stove, for the purpose set forth.

Second, Connecting the water and steam chambers by the steam and waste water pipes, arranged as described, for the purposes set forth.

Third, The valve, F, arranged to operate as a safety valve for the boiler, and as a return valve for the condensed waste steam, as described.

64,994.—BRICK.—Samuel McLaughlin, Philadelphia, Pa.

I claim bricks having ribs and grooves arranged substantially as and for the purpose herein set forth.

64,995.—MANUFATURE OF PACKING FOR STUFFING BOXES FOR STEAM ENGINES, PUMPS, ETC.—Wm. Hartley Miller, Philadelphia, Pa.

I claim the combination of these materials in a packing for engines, pumps, etc., in the manner shown and described.

64,996.—POTATO DIGGER.—Adam Minnis, Canton, Township, Mich.

First, I claim the whole combination of the machine, for the use and purposes named.

Second, I claim as new the shears, A A, etc. five or more, in shape and manner of adjustment.

Third, I claim as new the flexible knives, E E, etc., in the manner of their adjustment.

64,997.—HAWSE PIPE.—Parker Moody, Gloucester, Mass.

I claim the arrangement and combination of the auxiliary concave roller, D, and its chamber, b, with the hawse pipe, A, its oblique mouth piece, B, and the concave friction roller, C, arranged in such mouth piece, substantially as specified.

I also claim the cambination and arrangement of the dovetailed plates, d d, and recesses, e e, with the hawse pipe and its auxiliary roller, D, and roller chamber, b, as described.

I also claim the construction of the roller chambers with discharging passages f g h, having therefrom and communicating as described.

64,998.—COMBINED PRESS FOR CHEESE AND FOR OTHER PURPOSES.—Christian Musselman, Somerset, Pa.

I claim the arrangement of the lever, d, winch, f, platform, a, and rings and cylinders, l i k m o, in the manner and for the purposes set forth, the whole forming a press adapted to domestic uses.

64,999.—BREECH-LOADING FIRE-ARM.—Joseph and George Henry Needham (assignors to James G. Gray), (London, Eng.

We claim the arrangement of the breech piece, i, with its component parts, constructed and operating substantially in the manner described.

65,000.—MACHINE FOR MAKING TYPE MOLDS.—Mortimer Nelson, New York City.

First, I claim a wheel receiving in radial grooves movable types in combination with a lever and with projections on said wheel, substantially as set forth, whereby the lever that moves the type is also made to accurately adjust the wheel and hold it while the type is being impressed, as set forth.

Second, I claim a vertical wheel carrying movable types placed radially and constructed substantially in the manner specified.

Third, I claim the barrel, C, in combination with the type wheel, A, and keys, F, substantially as and for the purposes set forth.

Fourth, I claim the feed wheel, Z, rack, A, beds, S' and S, constructed and operated in substantially the manner and for the purposes set forth.

Fifth, I claim the spacing block, E2, and its actuating mechanism, applied substantially in the manner and for the purposes set forth.

Sixth, I claim the lever, W, in combination with the spacing block, E S, and feeding mechanism, substantially as specified.

Seventh, I claim a contractile band to draw the type back to place in the type wheel, as set forth.

65,001.—SHINGLE MACHINE.—Elijah R. Osgood, Columbus, Ohio.

First, I claim the manner shown and described of constructing the movable dogs of two parts, e e', jointed together and held so by a plate, substantially as described.

Second, The arrangement of the tripping toe, k, and a spring arm, j, acting upon an oscillading shaft, h, to which the extension arm, H', of said table is attached, all constructed and operating substantially as described.

Third, The spring arm, j, in combination with the rock shaft, h, and tripping toe, substantially as and for ahe purpose described.

Fourth, The combination of the forked arm, H', of the bolt table, H, oscillating shaft, h, adjustable block, g, and saw, D', substantially in the manner and for the purpose described.

Fifth, The arrangement of the wheels, a a, internally toothed plate, A A', spur wheel, C, shaft, C', saw and shaft, D D', belt, b, central shaft, E, cam, c, retractor, I, dogs, e e, curved way, G, spring arms, d d, and pivoted table H, all constructed and operating substantially in the manner described.

Sixth, The arrangement of the circular internally toothed plate, A A', oscillating bed, H H', saw, D, cam, c, retractor, I, dogs, e e, spring levers, d d, blocks, g g', rock shaft, h, spring arm, j, tripping toe, k, loaded arm, m, and weighted arm, l, w, all constructed and operating substantially in the manner and for the purpose described.

Seventh, A circular sawing machine constructed and operating on the principle herein described which is capable at the will of the operator of being made to saw stuff of equal or unequal thicknesses, substantially as set forth.

65,002.—COMPOSITION FOR INK.—Bernard Owens, St. Louis, Mo.

I claim the composition or like composition as above named and described and for the purposes set forth or any other substantially the same for the purposes set forth and to produce the above-named effect.

65,003.—STEAM ENGINE.—Horatio O. Perry and John L. Lay Buffalo, N. Y.

We claim the combination and arrangement of the shell or frame constituting the intervening chamber, K, with the two cylinders, A and B, and continuous piston rod, F, its bottom plate forming the cover of the cylinder, B, constructed substantially as and for the purposes herein set forth.

We also claim the stuffing box consisting of the sleeve, b, and packing box L, in combination with the chamber, K, and piston, F, and cylinders, A B, arranged and operating substantially as and for the purposes set forth.

We further claim the combination and arrangement of the manhole, I, with the bottom plate of chambers, K, forming the head of the cylinder, B, whereby the adjustable ring M, and sectional packing rings, r s, of the piston, B, may be removed, substantially in the manner and for the purposes herein set forth.

65,004.—HOG FEEDER.—I. S. Pope, Napoleon, Ohio.

First, I claim the wheel, G, as arranged in combination with the box, A, and trough, B, as and for the purpose described.

Second, The valve, K, as arranged and operated by the lever, L, in combination with the reservoir, I, and trough, for the purpose and in the manner as set forth.

65,005.—VAPOR BURNER.—Alonzo W. Porter and J. Hamilton Brown (assignors to Alonzo W. Porter and James S. Gray), New York City.

First, We claim mounting the heater cap and conductors on a plug having a ground edge fitting into a corresponding ground surface on the top of the retort, substantially in the manner described for the purpose of readily separating the heater cap from the retort to cleanse the latter.

Second, The combination substantially in the manner described of a locking yoke embracing the retort with a detachable plug supporting the conductors, for the purpose set forth.

Third, The combination of the retort, the central pipe, and the valve stem with the sleeve screw and yoke, for the purpose specified.

Fourth, A yoke which embraces the retort and serves both to lock the parts together and as an additional heat conductor.

65,006.—MACHINE FOR CUTTING TOBACCO.—E. L. Pratt, Boston, Mass.

I claim the swinging carrier, the cutter, and the gage plate, when arranged to operate together substantially as shown and described.

65,007.—FURNITURE FOR VESSELS.—Samuel F. Pratt, Roxbury, Mass.

I claim the combination of the seat and water-tight tank, when constructed and arranged to operate substantially as and for the purpose specified.

Also in combination with the foregoing, of one or more water-tight compartments, as and for the purpose specified.

65,008.—LOCOMOTIVE ENGINE.—Lucier Rarchaert, Paris, France, assignor to Richard and Henry L. Norris, Philadelphia, Pa.

First, I claim a locomotive engine having a main driving shaft with a crank formed in the same turning in fixed bearings secured to the frame and situated between two trucks each of which has a cranked axle coupled to the said main driving shaft, all substantially as and and for the purpose herein set forth.

Second, The combination of the said main driving shaft, E, the cranked axles of the trucks, and coupling bar, J, the several shafts and their cranks being arranged substantially as described.

Third, The bars, F and F', constructed and adapted to the main driving shaft and cranked axles of the trucks, substantially as and for the purpose herein set forth.

65,009.—AUTOMATIC WATER LEADERS.—Henry Reuch, Quincy, Ill.

I claim the spring, N, in combination with the valve, I, spring case, P, discharge pipe, J, and weight linked to the valve, all arranged substantially as described.

65,010.—LAMP HEATERS FOR VEHICLES.—Edwin H. Reynolds, Rising Sun, Md.

First, I claim a casing, B, having a perforated top, a, side openings, b, partition, G, and outlets, d, in combination with a detached lamp, the whole being constructed and applied to the bottom, A, of a vehicle, substantially as and for the purpose described.

Second, The combination of the above-mentioned casing, B, with a glass lamp chamber.

Third, The shields, n n, arranged beneath the tubular projections, d d, substantially as and for the purpose specified.

65,011.—VAPOR BURNER.—H. M. Richmond, Buffalo, N. Y.

First, I claim the combination of the transparent cone or deflector, A, with the inner cone, B, of a gas generating burner.

Second, In combination therewith I claim the flange, F, with the grooves, H and G, or the equivalent thereof, as and for the purposes described.

65,012.—TRACTION ENGINE.—John B. Root, New York City.

I claim the combination of variable or adjustable eccentrics or cranks on a rotating shaft driven by the engine, with reciprocating friction blocks or devices acting upon the wheels connected with the driving shaft of a locomotive or traction engine, substantially as specified.

65,013.—ROTARY VALVE.—John B. Root, New York City.

I claim the combination with a valve the face of which moves in the arc of a circle or arcs of circles, of a driving pin, G, projecting radially from the valve operating rock shaft and made cylindrical at its junction with the valve and to loosely fit or enter a cavity in the valve, substantially as and for the purpose or purposes herein set forth.

65,014.—CHURN.—W. W. Sanborn, Lyons City, Iowa.

I claim the perforated beater, H, the air tube, K, and the grooved bottom, J, when constructed, arranged, and operating substantially as and for the purposes above set forth.

65,015.—SASH SUPPORT.—John N. Sawtell, Chicopee, Mass.

I claim in a sash supporter the combination of the wedge, C, lever, E, and guide box, A, the whole constructed and operating substantially as described.

65,016.—VENTED FAUCETS.—Henry Schild and Jacob Schild, New York City.

We claim the valve, f, at the inner ends of the channels, j k, in combination with the elbow lever, b, and tooth, c, of the plug, B, constructed and operating substantially as and for the purpose described.

65,017.—ATTACHING CARRIAGE THILLS.—Gottlieb Schreyer, Columbus, Ohio.

First, I claim the construction, upon a clip strap, B, of a perforated lug, D, with a conical enlargement, b b, on its sides, adapted for receiving the slotted thill iron, E, and a bolt, G, substantially as described.

Second, The construction of the clip strap, B, with lips, c c, for holding rubber blocks, d d, and also with a perforated lug, D, having conical enlargements upon it, substantially as described and for the purpose set forth.

Third, The combination of the slotted thill iron, E, conical lug, D, and a tapering bolt, G, substantially as described.

65,018.—STEAM-GENERATOR GAGE COCK.—Thomas Shaw, Philadelphia, Pa.

I claim the construction and arrangement of the gage valve and whistle whereby to control the pressure, and to indicate the sound produced by steam, or steam and water commingled, or water unmingled with steam, substantially as set forth.

65,019.—INSULATING SUBMARINE CABLES.—George B. Simpson, Washington, D. C.

I claim the combination of gutta percha and metallic wire in such form as to incase a wire or wires, or other conductors of electricity, within the non-conducting substance gutta percha, making a submarine telegraph cable at once flexible and convenient, which may be suspended on poles in the air, submerged in water, or buried in the earth to any extent, for atmospheric and submarine telegraph communication, and for other electric, galvanic, and magnetic uses, as hereinbefore described.

65,020.—BEEHIVE.—Nathan Simpson, Pomeroy, Ohio.

I claim applying and arranging around the entrance to the beehive needles or other sharp pointed pieces of metal, substantially as set forth, and for the purposes stated in the foregoing specification.

65,021.—SLEIGH BRAKE.—Henry Sipe, Sipesville, Pa.

I claim the rock shaft, b, and arms or elbow levers, c c, in combination with the brake bars, d d, and pole or tongue, a, arranged and operated substantially as described.

65,022.—TOY.—George W. Sizer, Brooklyn, N. Y.

I claim the combination of one or more whistles with the toy known as the buzz, substantially as herein set forth.

65,023.—PADDLE WHEEL.—E. Spencer, Ottawa, Canada West.

I claim the pivoted buckets, I, provided with the cams, b and h, and arranged to operate in connection with the stationary ring, B, having the notches, n, and projections, c, formed thereon, substantially as shown and described.

65,024.—CONCRETE BRICK MACHINE.—James Stewart, and David Windsor, Sandwich, Ill.

First, We claim the combination and arrangement of the molds, B B, plungers, C C, following bar, E, arms, H H I I connecting arms, L L, and shaft, N, substantially as and for the purposes specified.

Second, We claim in combination with the above, the arms, F F, and lever, G, arranged as and for the purposes described.

65,025.—FENCE.—Jonathan Thomas, Mount Union, Ohio.

First, I claim the combination of the horizontal wires, C C, with strips, B B', looped around them substantially as shown and described.

Second, I claim the posts, A, constructed of bar iron in U form with the flanges at bottom to adapt them to be bolted to a base, substantially as described.

Third, The springs, J J, adapted and employed to operate substantially as and for the purpose set forth.

65,026.—CATTLE PUMP.—Harris W. Thornburg (assignor to C. W. Morrison), Morristown, Ind.

First, I claim the circular platform, A, in combination with shaft, R, when said shaft is arranged by means of slot, t, that the pumping apparatus will adapt itself to the weight of the animal, substantially as set forth.

Second, Spring, F, provided with friction rollers in combination with the tilting platform, A, as and for the purpose described.

Third, The circular or tilting platform, A, shaft, R, slotted head block, B, cam wheel, K, and lever, m, all arranged substantially as and for the purpose specified.

65,027.—BOOT AND GAITER STRAP.—William J. Turner, Utica, N. Y.

I claim the boot or gaiter strap, constructed and operating substantially as described.

65,028.—BED BOTTOM.—Charles Weed, Boston, Mass.

I claim the spring support made of one long and two short slats, when these are combined through the medium of stationary fulcra, and springs adjustable relatively to said fulcra, as means for graduating the yielding resistance of the support, substantially as described.

65,029.—BRUSH.—A. M. White, New York City.

I claim the enlarged chambers, a', of the holes, a, in combination with the staple-like wires, b, substantially as and for the purpose specified.

65,030.—HARVESTER RAKE.—William N. Whiteley, Jr., Springfield, Ohio.

First, I claim driving the rake and reel directly by means of a worm screw on the cutters crank shaft, and a worm gear on one end of the reel shaft, substantially as shown and described.

Second, The quadrant-shaped dropping platform, P, hinged to the finger bar, substantially as and for the purpose set forth.

Third, The combination of the quadrant-shaped platform, P, with the rake, G, arranged to operate in conjunction with said platform, substantially as described.

Fourth, The combination of the rake, G, the cam, F, and quadrant-shaped dropping platform, P, so arranged that the dropping of the platform is dependent upon the movement of the rake, substantially as described.

Fifth, In combination with the dropping platform, P, and rake, G, the stop, O, substantially as and for the purpose set forth.

Sixth, The combination of the clutch lever, L, and the stop lever, M, substantially as and for the purpose set forth.

Seventh, The combination of the cam, F, lever, S, and dropping platform, P, substantially as and for the purpose set forth.

65,031.—HORSE HAY FORK.—Michael Winsler, Wm. Campbell, and Lyman Hardman, Tuscarawas County, Ohio.

We claim the fork, A and B, when constructed and operated in such a manner that the point of the outside tine of each fork will come in contact with the point of the inside tine of the other fork, substantially as and for the purpose herein set forth.

65,032.—MANUFACTURE OF BROWN METALLIC PAINT.—Peter Winter, Horicon, Wis.

I claim the brown metallic paint, manufactured from the substance popularly known as dead or shot iron ore, consisting mainly of peroxide of iron and manganese, when treated substantially as herein shown and described.

65,033.—VALVE FOR STOVE-PIPE DAMPER.—Gaius B. Wiseman, Sycamore, Ill.

First, I claim a folding damper valve, composed of the leaves, B C D, operated by a sliding stem, A, the whole constructed substantially as set forth and described.

Second, The folding and revolving damper valve, constructed and operated substantially as set forth and described.

65,034.—WATCH.—Charles V. Woerd, Waltham, Mass.

I claim, in combination with the wheels, c, and means for rotating the same, the lever, b, provided with the wheel, d, when arranged to operate substantially as described.

Also, in combination with the lever, b, and wheel, d, a spring catch, latch pin, and stops, substantially as and for the purpose described.

65,035.—MACHINE FOR MAKING EYELETS.—Solomon W. Young (assignor to himself, J. W. Hoard, and R. A. Denison), Providence, R. I.

I claim the combination as well as the arrangement of the feeding mechanism, the dies, I I, the punches, m n, and mechanism for operating such punches substantially as described.

I also claim the die plate as made with the guide groove, b, and the gage cavity, k, arranged with the dies, I I, substantially as described.

65,036.—MACHINE FOR MAKING EYELET STOCKS.—Solomon W. Young (assignor to himself, J. W. Hoard, and R. A. Denison), Providence, R. I.

First, I claim the die plate as constructed with the groove or channel, b, and the depression, e, as and for the purposes set forth.

Second, I also claim the combination of the retainer, H, with the die and the punch, or the same and the guide channel, such retainer to operate with the punch, substantially as specified.

Third, I also claim feeding apparatus made substantially as described.

Fourth, I also claim the combination as well as the arrangement of such feeding apparatus, or its equivalent, with the punch and die and the retainer, as specified.

Fifth, I also claim the combination of the feeding apparatus, the punch and die, the retainer and the guide channel, to operate as specified.

Sixth, I also claim the combination as well as the arrangement of either or both the guide staples, with the die plate, the punch, and the feeding mechanism, as explained.

Seventh, I also claim the combination of the roller, f, the guide channel, the retainer, the punch, and die, one or more staples, and the feeding mechanism.

RE-ISSUES.

2,616.—MACHINE FOR GUMMING AND PRINTING ENVELOPES.—Henry C. Berlin and George H. Jones, New York City, assignors of Thomas V. Waymouth. Patented June 12, 1866. Reissued Sept. 25, 1866.

First, I claim the construction and operation of the hinged table B, substantially as and for the purpose set forth.

Second, The operation of the movable separator G, or its equivalent in combination with the gummer D, substantially as and for the purposes set forth.

Third, The combination of the gummer D, and reciprocating carrier F, or its equivalent and the endless apron H, or its equivalent, arranged and operating substantially as and for the purposes set forth.

Fourth, Imparting an intermittent motion by suitable mechanism to the endless apron H, or its equivalent, when combined with a reciprocating carrier F, and gummer D, for the purpose set forth.

Fifth, The operation of the rollers k', and finger l', separately or together in combination with the endless apron H, and carrier F, substantially as and for the purposes set forth.

Sixth, Gumming the seal flap of an envelope or similar blank by a gummer, which performs the double office of gumming the blank and raising or holding it stationary in combination with any suitable mechanism to receive the blanks, one after another after they have been gummed and carry any such blanks so gummed in such a manner that the gummed portions will be prevented from lying upon or overlapping each other, while drying, for the purpose set forth.

2,617.—PHOTOGRAPHIC ALBUM.—William W. Harding, Philadelphia, Pa., assignee by mesne assignments of Richard Van Velthoven and Joseph H. Hazzard. Patented Oct. 17, 1865.

I claim the binding of the sheets or cards of albums together by means of strips of leather or muslin, or their equivalents pasted or secured to the edges of contiguous or alternate sheets successively through the book.

2,618.—COOKING APPARATUS AND REFRIGERATOR.—Ignaz Newburg, New York City, assignee of Joseph and Ignaz Newburg. Patented Nov. 6, 1866.

I claim the non-conducting packing or material, composed of pasteboard boxes fitted one within another, substantially as herein set forth for the purpose specified.

Second, The double casing a b, and non-conducting material c, having an annular gutter m, openings i, opening g, and pan f, and furnished with the non conducting cover A, in combination with the central vessel B, the whole constructed and arranged substantially as herein set forth for the purpose specified.

2,619.—PAPER CUTTING MACHINE.—William Smith, South Windham, Conn., Executor of the estate of Enos P. Beckwith, deceased.—Patented Dec. 19, 1865.

First, I claim the employment in a paper cutting machine of a combination of two elements, to wit, a feed mechanism impelled by a motion intermittent which starts and stops the feed gradually, and a frictional connection, which allows a returning motion of the impelling mechanism, while the feed is at rest, and takes hold of and releases the feed at any point, without the lost motion due to ratchets, and the like toothed connections; all substantially as and for the purpose herein specified.

Second, The combination in a paper cutting machine, of a revolving knife, with a gradually starting intermittent feed mechanism, substantially as and for the purpose herein set forth.

Third, The within described arrangement of the revolving knife b, crank B2, link D, connecting means E, and intermittent feeding drum G, substantially as and for the purpose specified.

Fourth, In combination with mechanism, substantially as herein described for feeding forward and arresting the motion of the paper, I claim adjusting the length of the sheets by changing the position of the link D, or its equivalent, substantially as and for the purpose herein set forth.

Fifth, The pendulous piece C, arranged relatively to the knives a, and b, to the gradually stopping and starting mechanism, G H, or its equivalent in a paper cutting machine, substantially as and for the purpose herein specified.

Sixth, The spring K, arranged as specified relatively to the intermittent feeding mechanism E F G, and their connections, in a paper cutting machine.

Seventh, Taking hold of the feed roller so as to prevent its revolving backward when the forward motion is arrested in combination with the feed, having an alternated reversed motion, and gradually starting and stopping, as herein specified.

Eighth, The within described construction and arrangement of the brake M, so as to aid in arresting the forward motion at the proper time as well as to prevent the backward motion.

Ninth, The within described arrangement of the spring J, brake M, wheel G', and the connected parts of an intermittent feed in a paper cutting machine, substantially as specified.

Tenth, The catch or dog N, with a releasing device therefor in combination with the brake M, spring J, and suitable means for depressing the same, and the intermittent feeding drums G H, or their equivalents, in a paper cutting machine as specified.

Eleventh, The detaching cam B5, and surface N, brake M, and wheel G', or an intermittent feed in a paper cutting machine, substantially as specified.

2,620.—HARVESTER RAKE.—Robert Bryson, Schenectady, N. Y. Patented April 8, 1862.

First, I claim the combination of the vertical shaft E, angular guide bar I, rake head J, slotted arm F, connecting rod H, vibrating lever G, and crank B, substantially in the manner and for the purpose described.

Second, The combination of the many sided block K, rake head J, spring L, inclined lugs N N', loaded lever hook M, and loaded tripping hook levers, O O, the whole being constructed to operate substantially as described.

Third, In combination with a platform hinged to a draft frame having two supporting and driving wheels, I claim a circularly sweeping rake arm or handle, which moves in a plane parallel to the plane of the hinged platform, on a pivot which is on said platform; and which also receives an intermittent

oscillating motion about its own axis; when the support of such rake arm is located at or near the rear end of the platform which is attached directly to the finger beam, substantially as and for the purpose described.

Forth, I claim a hinged platform with a vibrating rake mounted upon it, said rake moving in the plane of the top of the platform while sweeping off the grain and then oscillating on its own axis so as to move back above the grain which is to be swept off by it in its return forward stroke, substantially as herein described.

Fifth, A rake arm which sweeps in the path of a part of a horizontal circle, oscillates in the path of a vertical circle, all without changing its altitude at any point, such rake arm being mounted on a platform which is hinged to the draft frame, and which is directly behind the cutting apparatus, substantially as described.

Sixth, A hinged platform with the elevated extension D, adapted for sustaining a rake which delivers the cut grain in gavels upon the ground in rear of the draft frame, substantially as described.

Seventh, A hinged platform with a rake arm J, which is provided with a latching device, said latching device moving with the rake arm in its passage over the platform, and acting to hold the teeth of the rake arm in a position for raking, and also in a position for passing unobstructedly over the grain upon the hinged platform, substantially as described.

Eighth, A rake which has both a circular vibrating movement and an intermittent oscillating movement, all without changing the plane of the rake arm mounted on a platform which is hinged to a two wheeled draft frame, substantially as and for the purpose described.

Ninth, A rake which has both a circular vibrating movement and an intermittent oscillating movement about its own axis all without changing the plane of the rake arm; such rake being mounted on a hinged platform and driven by a crank and pitman, from the inner side of a draft frame which has two separate and independent driving and supporting wheels, substantially as described.

2,621.—MANUFACTURE OF BLACK LEAD CRUCIBLES.—George Nimmo, Jersey City, N. J. Patented May 31, 1864.

I claim the manufacture of crucibles from a composition of which calcined plumbago or old pots ground, forms a part, substantially as set forth.

DESIGNS.

2,655.—DESIGN FOR A COOK'S STOVE.—John Abendroth, New York City.

2,656.—DESIGN FOR A CARRIAGE LAMP.—Marcus DeVoursney, Newark, N. J.

2,657.—DESIGN FOR A SHAFT FRAME.—Adolph H. Rau, Philadelphia, Pa.

2,658.—DESIGN FOR A PIANO STOOL.—Henry M. Ritter, (assignor to M. Greenwood & Co.,) Cincinnati, Ohio.

EXTENSIONS.

ORNAMENTING BOTTLES.—L. Q. C. Wishart, Philadelphia, Pa. Design. Letters Patent No. 1,161. Dated Oct. 25, 1859.

I claim the ornamental design, described and represented in the drawing for Pine Tree tar cordial bottles.

SUPPORTING THE TOPPING-LIFT AND PEAK HALYARD BLOCK OF SAIL VESSELS.—William and Stephen G. Coleman, Providence, R. I. Letters Patent No. 9,619. Dated Oct. 25, 1859.

We claim the supporting the topping-lift by means of a crane, of such form, and construction, that when the topping-lift sags, when the sail is hoisted, it shall not foul or chafe against the peak halyard block.

We also claim the so arranging and constructing such crane that it may also support the peak halyard block, substantially as specified.

MACHINE FOR PEGGING BOOTS AND SHOES.—J. J. Greenough, New York, City. Reissued No. 269, dated July 4, 1854. Again reissued No. 698, dated April 26, 1859. Letters patent No. 10,427. Dated Jan. 17, 1854.

I claim driving the pegs into boots and shoes automatically, by means of a peg driver operated up and down by a positive mechanical movement whether impelled by a cam, eccentric, or crank, or other equivalent, substantially as and for the purposes specified.

MACHINE FOR PEGGING BOOTS AND SHOES.—J. J. Greenough, New York City. Reissued No. 269, dated July 4, 1854. Again reissued No. 699, (Div. 2.) dated April 26, 1859. Letters patent No. 10,427. Dated Jan. 17, 1854.

I claim the moving the sole of the shoe along by means of the awl that forms the hole in which the peg is inserted, in combination with the peg driven, whether the peg driven be or be not employed to perform the additional function of presenting the peg, whereby each hole made by the awl is brought in succession in line for inserting the peg before the awl is withdrawn, as set forth.

MACHINE FOR PEGGING BOOTS AND SHOES.—J. J. Greenough, New York City. Reissued No. 269, dated July 4, 1854. Again reissued No. 700, (No. 3) dated April 26, 1859. Letters patent No. 10,427. Dated Jan. 17, 1854.

I claim cutting off shoe pegs from a strip of peg wood, or other material, by means of a lateral or side cut, that will cut straight across substantially as and for the purposes set forth when combined with suitable ways in which the strip slides, and machinery for driving the pegs as specified.

I also claim enclosing the peg by the cutter until it is driven as specified, by making the cutter, when in position, a part of the guiding tube substantially as set forth.

I also claim the combination of the endless feed with a cutter for severing the pegs in a shoe pegging machine, as above specified.

MACHINE FOR PEGGING BOOTS AND SHOES.—J. J. Greenough, New York City. Reissued No. 269, dated July 4, 1854. Again reissued No. 701, (No. 4) dated April 26, 1859. Letters patent No. 10,427. Dated Jan. 17, 1854.

I claim connecting the last with a horizontal slide or plate capable of presenting the shoe or boot, substantially as described, so that the shoe or boot attached thereto, may be turned and moved in any direction, in a horizontal or inclined course, in combination with a mechanism, substantially such as described, which tends constantly to force it upward against a rest or guide, but which will permit it to yield downward as described; but this combination I claim only when combined with the pegging mechanism above described, or any equivalent thereof.

And I also claim as an automatic means of moving and guiding the last to present it to the pegging apparatus, in the required line of pegging the guide groove and guide, and pinion and curved rack, substantially as decribed in combination with the mechanism above described or the equivalent thereof which permits the last to be moved in any desired direction as set forth.

MACHINE FOR PEGGING BOOTS AND SHOES.—J. J. Greenough, New York City. Reissued No. 269, dated July 4, 1854. Again reissued No. 702 (No. 5) dated April 26, 1859. Letters patent No. 10,427. Dated Jan. 17, 1854.

I claim the combination of the universal movement carriage, and lateral awl movement for properly presenting the shoe to receive the pegs in succession, as herein specified.

I also claim the combination of the mechanism for the cutting and feeding of the pegs, as herein described, or any equivalent therefor, with the automatic peg driver, as described.

I also claim the combination of the following elements, or their mechanical equivalents, namely, the peg-former, the peg-feeder, the peg-driver and the mechanism for moving the shoe, herein described, thus constituting an automatic machine for pegging shoes, as set forth.

MACHINE FOR PEGGING BOOTS AND SHOES.—J. J. Greenough, New York City. Reissued No. 269, dated July 4, 1854. Again reissued No. 703 (No. 6) dated April 26, 1859. Letters patent No. 10,427. Dated Jan. 17, 1854.

I claim the pegging of boots and shoes with nails or pegs drawnwire substantially as above described.

I also claim driving the pegs by means of the cutting nippers, said nippers cutting off the peg after it is driven, substantially as specified.

WEAVING CORDED FABRICS.—William Smith, New York City.—Letters patent No. 9,653. Dated April 5, 1853.

I claim the process of forming a fabric by the combination of stationary and movable warps with the two weft threads, passed simultaneously through the two sheds, formed above and below said stationary warps. The weft threads being held in place on the surface of the stationary warps by the movable warps.

SEWING MACHINE.—William Wickersham, Boston, Mass.—Letters patent No. 9,679. Dated April 19, 1853.

I claim the combination of a single needle and two thread guides (carrying separate threads) so operated that during one passage of the needle, through and out of the cloth, or other material to be sewed, one of the said guides, shall lay its thread in the hook of the needle, while during the next passage of the needle through and out of the cloth, the other guide shall lay its thread in the hook of the needle, each guide acting alternately, all substantially as herein before specified the improvement of making one of the said guides, viz: the guide I, with the long slot u, for receiving the thread in its passage to and through the other guide as specified.

I also claim the above described peculiar mode of sewing cloth, or other fabric, viz: by combining two threads with the fabric by drawing them through from the same side of the cloth and through each other's loops, interlooping them in plegma stitches so that the threads alternately bind each other substantially as specified.

The improved arrangement of applying the closing slide of the hooked needle, to the same side as the barb or hook, so that it may slide in a groove in the needle or carrier parallel to the motion of the needle, in the manner and for the purpose as specified.

BALANCING SLIDE VALVES OF STEAM ENGINES.—Robert Waddell, Liverpool, Eng.—Patented in England, April 27, 1853. Letters patent No. 10,999. Dated June 6, 1854.

First, I claim the equilibrium table with its ledges or their equivalents applied to and acting in combination with the valve substantially as herein described.

Second, I claim the packing pieces extending from the back of the valve chests and abutting against the back of the valve in combination with the small passages leading to the ports, substantially in the manner herein described.

Third, I claim combining the equilibrium table or its equivalent with the packing and small passages by the joint action of which a slide valve is perfectly and entirely balanced.

SEWING MACHINE.—William H. Johnson, Springfield, Mass.—Reissued No. 355, Feb. 26, 1856. Letters patent No. 10,597. Dated March 7, 1854.

First, I claim the making of a seam with a single thread, by the combination of a single needle, forked hook, and expanding lever, operating substantially in the manner and for the purpose herein specified.

Second, The forming or making of a seam from a single thread by the running of a loop of the thread through the material to be sewn, the running of a second loop through the material and putting the first loop through the second, the running of a third loop through the material and through the first-named loop, the carrying of a fourth loop through the material and putting the third through it, and so on, putting the first loop through the second and around the third, the third loop through the fourth and around the fifth, and so on, forming the belaying double loop stitch herein described, in the manner set forth.

Third, The feeding of the material to be sewn by means of a vibrating piercing instrument, whether said instrument be the needle itself or an independent instrument in the immediate vicinity thereof, substantially as herein described.

PROCESS FOR PREPARING GOLD.—Alfred J. Watts, Brooklyn, N. Y. Letters Patent No. 9,691. Dated April 26, 1853.

I claim the within-described process of preparing or crystalizing gold for the purpose of filling teeth, substantially as herein set forth and described.

KNITTING MACHINE.—John Mee, Lowell, Mass., assignor to John Mee and John Rourke, Lowell, Mass., and G. Mackennon, Portsmouth, N. H. Letters Patent No. 9,718. Dated May 10, 1853.

I claim two sets of thread guides in combination with two sets of needles (or their equivalents) and machinery for casting the loops, the whole being made to operate together substantially as hereinbefore specified.

I also claim two sets of thread guides in combination with two sets of needles and machinery for casting the loops, all substantially as described, and operating together to produce a ribbed knit fabric, such as I have explained.

I also claim the improvement of causing the two sets of needles to work or move up and down independently of each other or in other words so that one set may move downward or be moved out of the way of the thread guides to be brought into operation on the other set, such improvement enabling me to bring or arrange the two sets of needles close together and thus make closer work than can be produced when the two sets of needles are made to move in one direction (either up or down) at the same time

WARP KNIT FABRIC.—Jno. of Mee, Lowell Mass., assignor to Jno. Mee and Jno. Rourke, Lowell, Mass, and G. Mackennon, Portsmouth, N. H. Letters Patent No. 9,719. Dated May 10, 1853.

I claim the above described new or improved manufacture of warp skirt ribbed fabric, the same being made by means of two sets of hooks or two sets of warps or warp yarns laid and looped together, and upon the said hooks or needles, substantially in the manner specified, and whether to exhibit ribs to equal or unequal widths on opposite sides of the fabric as explained.

MACHINE FOR SHRINKING HAT BODIES.—Jas. S. Taylor, Danbury, Conn. Letters Patent No. 9,700. Dated May 3, 1853.

I claim the process of shrinking or sizing the hat bodies by passing them longitudinally into and through a chamber formed by placing several cylinders or rollers having concave or other denomination of surfaces in such a proximity as to form the said chamber as hereinbefore substantially set set forth.

MACHING FOR POINTING AND THREADING SCREW BLANKS.—Thomas J. Sloan, New York City. Letters Patent No. 9,688. Dated April 26, 1853.

I claim combining in an organized machine, a cutter and its appendages operated substantially as specified for forming the point on screw blanks, as specified, with the chaser or cutter which cuts the thread over the shank and pointed part thereof down to the point substantially as specified.

Inventions Patented in England by Americans.

[Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

1,651.—MACHINE FOR CUTTING SCALE-BOARD, AND FOR THE MANUFACTURE OF THE SAME INTO AN IMPROVED FABRIC FOR STRUCTURES GENERALLY.—John K. Mayo, New York City. April 8, 1867.

1,653.—APPARATUS FOR REGULATING AND TRANSMITTING ELECTRIC CURRENTS, ESPECIALLY DESIGNED FOR USE IN CONNECTION WITH TELEGRAPHIC INSTRUMENTS FOR LONG SUBMARINE LINES.—George Little, New York City. April 8, 1867.

952.—PROCESS FOR MANUFACTURING ICE.—Thaddeus S. C. Lowe, New York City. March 30, 1867.

1,000.—ARTIFICIAL STONE FOR GRINDING, WHETTING, OR POLISHING PURPOSES, AND A PROCESS FOR PRODUCING THE SAME.—Geo. E. Van Derburgh, New York City. April 3, 1867.

1,023.—STEAM GENERATOR.—Mitchel Safety Steam Generator Company, Albany, N. Y. April 5, 1867.

1,044.—MODE OF EMBALMING.—Geo. W. Scollay, St. Louis, Mo., April 6, 1867.

1,068.—MACHINERY FOR PICKING AND GINNING COTTON.—Enoch Osgood, Boston, Mass. April 10, 1867.

1,078.—BRICK MACHINE.—Richard A. Douglas, Chicago, Ill. April 11, 1867.

1,069.—BREECH-LOADING FIRE-ARMS.—Henry H. Wolcott, Yonkers, N. Y. April 10, 1867.

1,077.—MODE OF AND APPARATUS FOR MULTIPLYING POWER, ESPECIALLY APPLICABLE TO HOISTING OR LIFTING MACHINERY.—Henry J. Griswold, Boston, Mass. April 11, 1867.

864.—MACHINERY FOR CUTTING CHANNELS IN STONE, ETC.—George J. Wardwell, Rutland, Vt. March 25, 1867.

866.—BREECH-LOADING FIRE-ARMS AND CARTRIDGES.—Loughlin Conroy and Tristram D. Vanderveer, New York City. March 25, 1867.

871.—STEAM AND VACUUM GAGE.—Emmett Quinn, Washington, D. C. March 26, 1867.

876.—SCREWS.—Valentine Fogerty, Boston, Mass. March 26, 1867.

882.—VALVE GEAR OF STEAM ENGINES.—William Wright, New York City March 26, 1867.

883.—LOOMS.—Erastus B. Bigelow, Boston, Mass. March 26, 1867.

894.—MACHINE FOR PAINTING METALLIC SURFACES, ETC.—Henry Fassmann, New Orleans, La. March 27, 1867.

EXTENSION NOTICES.

Charles Watt, of Putney, England, and Hugh Burgess, of Boyer's Ford, Pa., having petitioned for the extension of a patent granted to them the 18th day of July, 1854, and antedated the 19th day of August, 1853, reissued the 5th day of October, 1858, and again reissued in two divisions the 7th day of April, 1863, for an improvement in process of treating wood and other vegetable substances in the manufacture of paper pulp, for seven years from the expiration of said patent, which takes place on the 19th day of August, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 5th day of August next.

Henry Ritchie, of Newark, N. J., having petitioned for the extension of a patent granted to him the 23d day of August, 1853, for an improvement in padlocks, for seven years from the expiration of said patent, which takes place on the 23d day of August, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 5th day of August next.

Arshal H. McKinley, of Higginsport, Ohio, having petitioned for the extension of a patent granted to him the 16th day of August, 1853, for an improvement in socket for auger handles and braces for seven years from the expiration of said patent, which takes place on the 16th day of August, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 29th day of July next.

NEW PUBLICATIONS.

THE ART OF PERFUMERY. By G. W. Septimus Piesse. Philadelphia: Lindsay & Blakiston.

This book gives the methods of obtaining the odors of plants, and instructions for the manufacture of perfumes, cosmetics, etc., upon which subjects it is quite full and apparently complete. It is illustrated with numerous engravings and is neatly published.

THE ART OF MANUFACTURING SOAP AND CANDLES, Embracing Hard, Soft, and Toilet Soaps, the Modes of Detecting Frauds, etc., etc. By Adolph Ott. Philadelphia: Lindsay & Blakiston.

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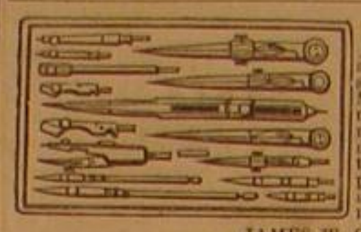
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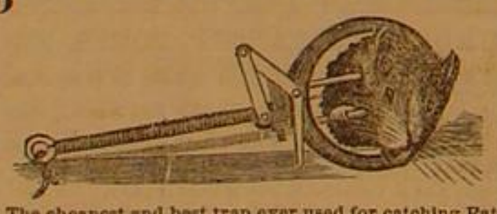
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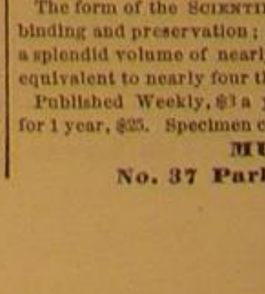
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