

drinking Englishman, what Franklin was to the London printers. It is beyond the capacity of a well-beered brain even to read the pamphlet on Liberty and Necessity, which Franklin wrote in those times.

The few experiments which have been made, with a view to trace the course of alcohol in the living system, all confirm what all drinkers feel, that it is to the brain that alcohol hurries when it has passed the lips. Some innocent dogs have suffered and died in this investigation. Dr. Percy, a British physician, records, that he injected two ounces and a half of alcohol into the stomach of a dog, which caused its almost instant death. The dog dropped very much as he would if he had been struck upon the head with a club. The experimenter without a moment's unnecessary delay, removed the animal's brain, subjected it to distillation, and extracted from it a surprising quantity of alcohol,—a larger proportion than he could distill from the blood or liver. The alcohol seemed to have rushed to the brain; it was a blow upon the head which killed the dog. Dr. Percy introduced into the stomachs of other dogs smaller quantities of alcohol, not sufficient to cause death; but upon killing the dogs, and subjecting the brain, the blood, the bile, the liver, and other portions of the body to distillation, he invariably found more alcohol in the brain than in the same weight of other organs. He injected alcohol into the blood of dogs, which caused death; but the deadly effect was produced, not upon the substance of the blood, but upon the brain. His experiments go far toward explaining why the drinking of alcoholic liquors does not sensibly retard digestion. It seems that, when we take wine at dinner, the alcohol does not remain in the stomach, but is immediately absorbed into the blood, and swiftly conveyed to the brain and other organs. If one of these "four-bottle men" of the last generation had fallen down dead, after boozing till past midnight, and he had been treated as Dr. Percy treated the dogs, his brain, his liver, and all the other centers of power, would have yielded alcohol in abundance; his blood would have smelt of it; his flesh would have contained it; but there would have been very little in the stomach. Those men were able to drink four, six, and seven bottles of wine at a sitting, because the sitting lasted four, six, and seven hours, which gave time for the alcohol to be distributed over the system. But instances have occurred of laboring men who have kept themselves steadily drunk for forty-eight hours, and then died. The bodies of two such were dissected some years ago in England, and the food which they had eaten at the beginning of the debauch was undigested. It had been preserved in alcohol as we preserve snakes.

Once, and once only, in the lifetime of man, an intelligent human eye has been able to look into the human stomach, and watch the process of digestion. In 1822, at the United States Military post of Michilimackinac, Alexis St. Martin, a Canadian of French extraction, received accidentally a heavy charge of duck-shot in his side, while he was standing one yard from the muzzle of the gun. The wound was frightful. One of the lungs protruded, and from an enormous aperture in the stomach the food recently eaten was oozing. Dr. William Beaumont, U. S. A., the surgeon of the post, was notified, and dressed the wound. In exactly one year from that day the young man was well enough to get out of doors, and walk about the fort; and he continued to improve in health and strength, until he was as strong and hardy as the most of his race. He married, became the father of a large family, and performed for many years the laborious duties appertaining to an officer's servant at a frontier post. But the aperture into the stomach never closed, and the patient would not submit to the painful operation by which such wounds are sometimes closed artificially. He wore a compress arranged by the doctor, without which his dinner was not safe after he had eaten it.

By a most blessed chance, it happened that this Dr. William Beaumont, stationed there on the outskirts of creation, was an intelligent, inquisitive human being, who perceived all the value of the opportunity afforded him by this unique event. He set about improving that opportunity. He took the young man into his service, and, at intervals, for eight years, he experimented upon him. He alone among the sons of men has seen liquid flowing into the stomach of a living person, while yet the vessel was at the drinker's lips. Through the aperture (which remained two and a half inches in circumference) he could watch the entire operation of digestion, and he did so hundreds of times. If the man's stomach ached, he could look into it and see what was the matter; and, having found out, he would drop a rectifying pill into the aperture. He ascertained the time it takes to digest each of the articles of food commonly eaten, and the effects of all the usual errors in eating and drinking. In 1833 he published a thin volume, at Plattsburg, on Lake Champlain, in which the results of thousands of experiments and observations were only too briefly stated. He appears not to have heard of teetotalism, and hence all that he says upon the effects of alcoholic liquors is free from the suspicion which the arrogance and extravagance of some teetotalers have thrown over much that has been published on this subject. With a mind unbiased, Dr. Beaumont, peering into the stomach of this stout Canadian, notices that a glass of brandy causes the coats of that organ to assume the same inflamed appearance as when he had been very angry, or much frightened, or had over eaten, or had had the flow of perspiration suddenly checked. In other words, brandy played the part of a foe in his system, and not that of a friend; it produced effects which were morbid, not healthy. Nor did it make any material difference whether St. Martin drank brandy, whisky, wine, cider, or beer, except so far as one was stronger than the other.

"Simple water," says Dr. Beaumont, "is perhaps the only

fluid that is called for by the wants of the economy. The artificial drinks are probably all more or less injurious; some more so than others, but none can claim exemption from the general charge. Even tea and coffee, the common beverages of all classes of people, have a tendency to debilitate the digestive organs. \* \* \* The whole class of alcoholic liquors may be considered as narcotics, producing very little difference in their ultimate effects upon the human system.

He ascertained, too, (not guessed, or inferred, but ascertained, watch in hand) that such things as mustard, horse radish, and pepper retard digestion. At the close of his valuable work, Dr. Beaumont appends a long list of "Inferences," among which are the following: "That solid food of a certain texture is easier of digestion than fluid; that stimulating condiments are injurious to the healthy system; that the use of ardent spirits always produces disease of the stomach if persisted in; that water, ardent spirits, and most other fluids, are not affected by the gastric juice, but pass from the stomach soon after they have been received." One thing appears to have much surprised Dr. Beaumont, and that was, the degree to which St. Martin's system could be disordered, without his being much inconvenienced by it. After drinking hard every day for eight or ten days, the stomach would show alarming appearances of disease; and yet the man would only feel a slight headache, and a general dullness and languor.

If there is no comfort for drinkers in Dr. Beaumont's precious little volume, it must also be confessed that neither the dissecting knife nor the microscope afford us the least countenance. All that has yet been ascertained of the effects of alcohol, by the dissection of the body, favors the extreme position of the extreme teetotalers. A brain alcoholized the microscope proves to be a brain diseased. Blood which has absorbed alcohol is unhealthy blood,—the microscope shows it. The liver, the heart, and other organs which have been accustomed to absorb alcohol, all give testimony under the microscope which produces discomfort in the mind of one who likes a glass of wine, and hopes to be able to continue the enjoyment of it. The dissecting knife and the microscope, so far, have nothing to say for us,—nothing at all; they are dead against us.

[To be continued.]

#### THE ARTS AND MANUFACTURES OF SAVAGES.

THE recent lectures of Sir John Lubbock at the Royal Institution, upon the Arts and Manufactures of Savages, contain much useful information of interest not only to mechanics but to ethnologists, and the general reader. We condense from the *Engineer* the substance of a portion of these important lectures.

In the first lecture the speaker called attention to the habits and customs of savages. While speaking of the modes of torture adopted in many tribes to test the powers of endurance of their own warriors, Sir John Lubbock said that cutting and piercing wounds are not always so painful as they look. In proof of this he took a common pin, and with the back of a book beat it up to its head into his leg about eight inches above the knee, then pulled it out and went on with the lecture, saying that the operation caused him very little pain or inconvenience.

This experiment however illustrative or sensational it might have been, is not such as we should advise any of our young readers to repeat. We were once personally cognizant of the death of a shoemaker by lockjaw, resulting from a punctured wound in the thigh caused by the slipping of an awl, which was much less formidable apparently than the self-inflicted puncture in Sir John Lubbock's leg. In the second lecture he dealt more especially with the facts relating to the subject of this article. He said that animals although often using stones to crack nuts, etc., could not properly be said to use implements as everything used by them was in its natural condition.

Man, said the lecturer, was in his lowest state probably able to advance in the construction of implements faster than other animals owing to three causes, namely, mental power, the possession of a hand, and the length of life which permits the accumulation of experience. However this may be, it is a fact that the lowest savages have a considerable variety of implements and weapons. These implements and weapons it is very difficult to classify, but perhaps the hammer and the knife may be regarded as a pair from which all the rest have sprung, even to the steam engine of modern times.

Two facts strike almost every one who examines with attention any good collection of savage implements. First, how the same types are found repeated in different parts of the world, and secondly, how gradually the different types pass into one another. Weapons, which to our eye are very similar, would be far from presenting the same uniformity of appearance to the savage, just as one man prefers one kind of steel pen to another. The simplest of the whole series of human implements is the hammer. That with which the Botocudo in Brazil breaks the hard, thick-walled fruits of his primeval forest, is often nothing but a stone. Stones bearing marks of such use are to be found in all collections of ancient stone implements. Stones also were the earliest missiles of savages, and were thrown at first by hand; there are however, a few records by travelers respecting savages said to be very skillful in throwing stones with their feet. Slings of two kinds are in use among savage tribes—one being the string sling, and the other a stick with a cleft in the top in which the stone is placed. Professor Nilsson has suggested that the sling used by David in his combat with Goliath was probably the latter kind, because the giant said—"Am I a dog, that thou comest to me with staves?"

The passage from the simple stone hammer to the club is easy, as the club is, after all, only an elongated hammer.

Branches of trees, however, naturally take this shape, and were probably used before stone clubs, which are very rare weapons, though they are sometimes used. All savage races have some clubs, which are merely pieces of wood thicker at one end than the other; but besides these, there are generally many of more artificial forms, and which are more or less elaborately carved.

The boomerang may also be regarded as a modification of the club. It is remarkable, not only for its form and properties, but also because it seems to be peculiar to Australia. This was the opinion of Dr. Klemm, the greatest authority on such a subject. It has, indeed, been stated that the natives of the Upper Nile use iron boomerangs, and they do, no doubt, throw a flat iron club or scimitar; but the special characteristic of the boomerang is that of returning to the point from whence it is thrown, and this property, we are expressly told by Sir Samuel Baker, the so-called African boomerangs do not possess. The natives of Guzerat also possess a form of club, which Colonel Lane Fox calls a "boomerang," but in this case also it seems probable that it does not return.

Eyre thus describes the mode of throwing the boomerang:—"Those whose angles are slightly obtuse are usually thrown with the sharp edge against the wind, and go circling through the air with amazing velocity to a great height and distance, describing nearly a parabola, and descending again at the foot of the person who throws them; those which have the largest obtuse angle are thrown generally against the ground, from which they bound up to a great height, and with much force. With both, the natives are able to hit distant objects with accuracy, either in hunting or in war; in the latter case this weapon is particularly dangerous, as it is almost impossible, even when it is seen in the air, to tell which way it will go or where descend. I once nearly had my arm broken by a wangno while standing within a yard of the native who threw it, and looking out purposely for it."

The shield is probably a modification of the club. The shields of the Australians are narrow, and intended rather to ward off the missiles than to arrest them, being only two or two and a half feet long, and at most eighteen inches broad. The shields of the Caffres are very large. Shields among savages are usually made of skin or hide and rarely of wood.

A few very low races of savages are entirely without cutting instruments, though such instances are most rare. The sharp edge of a piece of bamboo or cane forms a very good knife for some purposes, and bone knives are useful even in civilized communities. But the flint-flake is the habitual knife of savage life, and flint has taken a much more important part in the development of human civilization than we should have been disposed to admit a few years ago. The natural edges of some few flints may have given the first idea of a knife-edge, and even in the use of flint as hammer, sharp splinters would occasionally be knocked off. Typical flint-flakes such as these however are not found in nature, nor must it be supposed they are easy to make, a peculiar "knack" being necessary, as anybody may prove by experiment. Among savages flint-flakes are very universally met with. They are more abundant of course, where flint naturally occurs, but they seem to have passed from hand to hand and from one tribe to another, until they have traveled far from their place of manufacture. Some localities are known at which flint-flakes were evidently made in considerable numbers. All flakes having two sharp edges are at once fit for use and serve as knives, spear-heads, arrow-heads, and a variety of other purposes. They have been wrought into fish hooks, and in the Paris Exposition there was a Circassian thrashing machine, consisting of a broad board studded with flint flakes.

The axe, however, is the principal cutting instrument of savages, and the simpler forms of it have been nearly identical all over the world. No axes like those now employed by the Indians of North and South America have been used in Western Europe for many centuries, but in ancient times they were common here. It is so long since such axes were used in Europe that even in the times of the Romans, as now, when found by the ignorant peasantry, they were regarded as thunderbolts. The Danish axes were very well made. Now the question arises—"How were the axes of savages used?" No doubt they were much inferior to metal. Captain Cook tells us expressly that it was necessary to sharpen the South Sea axes "almost every minute, for which purpose a stone and a cocoanut shell full of water are always at hand." Moreover, even with the best of them it took several days labor to cut down a single tree, consequently we may be confident that no people who were acquainted with metal would have gone to the immense labor necessary to make a stone axe and to keep it in working order. They are very liable to break in use, and then have to be thrown away or re-ground. Still with stone axes the South Sea Islanders were able to cut down large trees and build canoes, some of which were ninety feet long. The handles of ancient axes, having been made of wood, have generally perished long ago, though not always. Many of the axes of metal now made and used by savages have unmistakably the old type of the stone blade.

The simplest form of spear is a mere stick of wood pointed at one or both ends, and sometimes hardened by being heated in the fire. The spears of the Australians are from eight to fourteen feet long. Some are merely pointed rods of hard wood, tipped with the sting of the sting-ray, and barbed with other smaller stings. Some have barbs of bone, others have barbs of wood, while others have a slit on one or both sides, in which is a row of pieces of shell or sharp stone. These spears are thrown with great force and skill.



The lecturer having minutely described and exhibited the one pointed spears of different savage tribes, said that the South Sea Islanders occasionally poison their spears by thrusting them into a corpse, and leaving them while the flesh decays.

The spear is generally and was probably originally thrown simply by the hand. Several races however, now possess an implement for the purpose, which is called a "throwing stick" or "spear-caster." This throwing stick is a flat piece of hard wood, generally, but not always, broader in the middle, with a piece of bone or tooth at one end as a catch for the end of the spear, and a lump of gum at the other to keep the hand from slipping. The spear-caster seems to be unknown in Asia, Africa and Europe, but it is used by the Esquimaux, and by one of the Brazilian tribes.

The arrow follows naturally after the smaller spear or javelin—indeed, the only way in which it can be distinguished satisfactorily is by the presence at the hinder end of a notch for the spring; for, though generally feathered at the end, many are bare. The bow and arrow, though very generally distributed, are not universal. The Australians and New Zealanders were entirely ignorant of them, nor are they used by the Caffres. The neighboring Bushmen on the contrary, rely principally on their bows and arrows, which, though weak, are formidable, because poisoned. The form of the bow varies very much. In the south it is said to be much longer than in the north; among equestrian races it is naturally much shorter than among those who go on foot. Among savages the arrows are very carefully made, because a bad shot often involves two or three days labor. Although the gun is gradually superseding the bow, still the latter possesses certain advantages, as it makes no noise, therefore does not frighten the game so much, and is lighter to carry. There is, moreover, a kind of arrow which is not used with a bow, but with a blow pipe, usually from six feet to sixteen feet long. These weapons occur in Sumatra and in the neighboring islands, also in South America, but not in Africa. In Western Europe it is represented by the pea-shooter.

The first traces of art with which we are acquainted began at a very early period, and have been found in a manner quite unexpected. Among the remains of a man discovered in the French caves, and belonging to the reindeer period—that is to say, at a time so early that the reindeer was abundant in the south of France, and when possibly—though on this point there is much doubt—even the mammoth had not entirely disappeared, simple carvings and etchings have been discovered giving unmistakable representations of animals. These works of art are sometimes sculptures, if one may so say, and sometimes drawings made on bone or horn with the point of a flint. They are of peculiar interest, being of far more ancient date than even the monuments of Assyria and Egypt. There are those who express surprise at the skill shown in the drawing of savages, but there is no reason why a savage living unknown ages ago should not draw as well as a child of to-day.

Sir John Lubbock then proceeded to describe at some length the skill in carving exhibited by many savage tribes. He also pointed out that some savages have no ideas of art, and cannot understand a picture when it is shown to them. He added that it is somewhat remarkable that while in the reindeer period we find very fair drawings of animals, in the latest part of the stone age, and throughout that of bronze, they are almost entirely wanting, and the ornamentation is confined to various combinations of straight and curved lines, and geometrical patterns. This he believed would be eventually found to imply a difference of race between the population of western Europe at these different periods.

#### MORE ABOUT SUBMARINE EXPLORATION.

Our description of the submarine apparatus now being used in the attempted recovery of treasure from the wreck of the frigate *Huascar*, has given rise to inquiry for further information upon the subject. We herewith give an account of the commencement of submarine exploration, and its progress up to the present time. As we said in our former article, diving without the use of apparatus was the beginning, and it dates back to a very early period. Homer, in the sixteenth book of the *Iliad*, describes Patroclus as taunting Hector's charioteer for falling from his horse when he was slain, as a diver goes into the sea to bring up oysters. Other references to diving are to be found in ancient works. Thucydides speaks of the employment of divers to saw off stockades driven into the bottom of a harbor to prevent Greek ships from entering. Livy gives an account of their employment for the recovery of treasure and merchandise. The story of Antony's fishing and bringing up a salt fish attached to his hook by a diver employed by Cleopatra, is a familiar one. The first attempts to aid divers in their descent, were confined to such rude devices as bladders placed over the mouth and weights to help them to descend and remain more easily. In Pliny's time divers used a long pipe with a floating funnel to enable them to breathe under water while engaged in the operations of ancient warfare. In 1252, Bacon, in his "Discoveries of the Miracles of Art, Nature, and Magic," says: "A man may make an engine whereby without any corporal danger, he may walk at the bottom of the sea or other waters." Like many other hints which were thrown out by Bacon and which have found their interpretation since, in the great inventions which have succeeded them, this was unaccompanied by any detailed description.

The real history of devices for submarine exploration dates from the sixteenth century. From that time to the present, there has been gradual improvement in this art. Not the least meritorious of the inventions which have been made belong to our own time and country, but of them anon.

As all the devices for submarine navigation have hitherto met with little or no success, we shall pass them without remark, and confine ourselves to those devices which have had for their object the simple descent and continuance beneath the surface in safety and comfort. These devices have, comparatively speaking, only lately begun to assume a form approaching perfection. The earliest mention of a diving bell that we can find is in "Beekman's History of Inventions." He says that in the sixteenth century, in the presence of the Emperor Charles V., and several thousand spectators, two Greeks let themselves down under water in a large "inverted kettle" with a burning light and rose again "without being wet." In the latter part of the fifteenth century, some attempts were commenced to recover from the Spanish Armada, the treasure which was lost at the time of its disaster near the Island of Mull in the Hebrides, but without success only three guns being recovered. In this attempt a bell was used devised by the Marquis of Argyll, to whom the British Government pledged all the treasure he should succeed in recovering.

In 1680, William Phipps invented a square box of iron with windows and a seat for divers, with which the Spanish treasure was again sought. After having once failed he was assisted by the then Duke of Albemarle, and succeeded in finding and recovering treasures to the value of \$1,000,000 in gold. For this feat he was knighted. In 1683, Sinclair, the mathematician, published a series of calculations relating to the size of a bell necessary to contain air for a given number of men for a given period, and the proper thickness and shape of its walls to withstand pressure; the depth to which bells of certain construction could safely descend, etc. These calculations were of the greatest value to the advancement of the art. In 1775, the celebrated Dr. Halley contrived a way for supplying air to a submerged bell, by sinking a number of barrels filled with air to the bottom, which was transferred to the bell by means of tubes and cocks, an escape-cock being placed at the top of the bell. With this apparatus, slightly improved, Mr. Spaulding and an assistant attempted to recover the cargo of a vessel wrecked on the coast of Ireland, but by some means they were unable to obtain a supply of air from the barrels and were suffocated. Smeaton was the first to supply air to bells by the use of forcing pumps, and since his time the air pump has been constantly used in similar attempts. We have not space to give in detail an account of the progress of improvement in diving bells in other countries since Smeaton's time. Some very efficient submarine armor has been devised, to which we referred in our former article, together with some difficulties which cannot probably be obviated in this class of devices.

These inventions have, notwithstanding, proved of great service in submarine engineering. In the early part of the present century by the use of a modification of Kleingert's armor, Tonkin recovered treasure from the *Abergavenny*, sunk near Weymouth, amounting to \$300,000.

We are indebted to Dr. J. A. Weisse for the following particulars of the most recent improvements in diving bells.

"The *Nautilus* Diving Bell, exhibited at the Crystal Palace in New York, was an improvement on all previous diving bells, having within its walls a working chamber, an air chamber, and a ballast or water chamber. The able engineer, William Mont Storm, improved the *Nautilus*, whose patent expired some years ago.

The *Ryerson* Diving Bell, patented October 19th, 1858, had like the *Nautilus*, a working chamber, an air chamber, and a ballast or water chamber with some improvements. In this bell, Otto Sackersdorf, engineer of our Street Department for twenty years, blasted and removed 2,100 cubic yards of Diamond Reef and opened the channel between Governor's Island and Brooklyn.

In a written statement of October 6th, 1864, Mr. Sackersdorf speaks thus of the *Nautilus*, *Maillet's* Bell, and of the *Ryerson* Bell: "The *Nautilus*, although a decided improvement, has not verified its promises. I have tried it at the Navy Yard in 1854. It does not work independently from the surface and uses too much air.

"*Maillet's* Bell has some good features for stationary work, but it is immovable and very dangerous on account of its funnel or man-hole. Absolutely impracticable for any depth of water, say twenty-five or thirty feet or strong tide.

"The *Ryerson* Bell carried about four atmospheres of pressure in the chambers, and its lifting power was up to eight tons. Heavy rocks were taken and dropped in deep water. The bell was independent of anything above water (signal-line excepted), and carrying the means of respiration and motive power in itself; remains any length of time below, or descends or ascends with any velocity you choose. Twenty seconds were more than enough to descend twenty-five or thirty feet. The old fashioned bell required on the same spot sixteen minutes, not mentioning the slow and dangerous mode of entering or leaving. Suffice it to say, that our bell had about nine feet of diameter inside. Five men had ample room to work in. They experienced no difficulty whatever and changed but once a day with the gang on board the vessel above. Any man of common sense can be easily instructed to work the apparatus, so simple is the arrangement thereof. A leak is at once indicated by the barometer, and by this means all danger of drowning made impossible."

William Mont Storm's "Improved Submarine Explorer," to which the Patent Office, May 1, 1866, granted eight new claims of improvement over all its predecessors, has been still further improved by Mr. Wm. R. Taylor.

A report of the principles involved in these bells and of the uses they may be applied to, by Wm. W. Wood, chief engineer of the United States Navy, may be found in the Navy Department, dated February 2, 1865. Admiral Farragut,

looking at a drawing of the Improved Submarine Explorer, observed that naval warfare would soon be carried on as vigorously under as above water.

With this bell, as we stated in our former article, an engineer and four men with provisions, lights, and working tools of every kind, can descend to certain depths of fresh or salt water, work at wrecks, blast rocks, remove harbor obstructions, lay foundations for wharves, piers, docks, lighthouses, bridges, sea walls, fortifications, and repair the same with almost as much facility as on *terra firma*. Thus millions of wrecked treasure and merchandise might be raised, and all the Scylla and Charybdis, Hell Gates, and Cliffs, so much dreaded by mariners, might be widened, deepened, and cleared all over the world.

#### Weight of the Air.

The air is composed of two ingredients, not in combination, but as a mixture, like wine and water. These ingredients are oxygen and nitrogen. They exist in the proportion of 23 of oxygen to 77 of nitrogen in 100 parts. Besides these, the air contains of carbonic acid about 3 parts in 10,000. Our atmosphere is estimated to contain about 1,954,578 cubic miles of oxygen. The respiration of man and animals, together with the combustion of fuel, consumes annually about 2½ cubic miles; consequently 250 cubic miles in 100 years, or only a 10,000th part in this time. The above paragraph reveals even more wonderful facts; a single perusal of it is sufficient to suggest questions of a most startling character.

Thus it appears, that in the course of ages, say 1,000,000 the supply of oxygen would be exhausted, and its beneficial place taken by carbonic acid, generated by respiration and other forms of combustion. But such was not to be. Let us for an instant consider the revelations of geology. It tells us that ages before the creation of man, the atmosphere contained a larger proportion of carbonic acid than it does at the present day. The question then arises, what has become of it? Let us dig into the earth till we discover coal; we then find our answer. The excessive carbonic acid of the early atmosphere has been converted into coal—coal, the remains of trees, which, in their lifetime, possessed the power common to all living plants, that of decomposing carbonic acid; depositing within their cells the carbon, and returning to the air its oxygen, for carbonic acid is only composed of carbon and oxygen.

What does the air weigh? Nothing, many will answer. But this is a great mistake, for every 100 cubic inches of air weigh slightly more than 31 grains. A cubic yard of oxygen weighs 2 lb. 4 oz. 7 dr. Such being the case, a cubic mile of oxygen weighs nearly 5,543,623 tons 10 cwt. By another multiplication sum it is easy to show that the whole of the oxygen in the atmosphere weighs 10,835,444,533,383; and, since the oxygen and nitrogen of the air exist in the proportion of 23 of the former to 77 of the latter, as before stated, the total weight of nitrogen of the air is the amazing amount of 36,275,183,872,630 tons, while the total weight of the air, which is the result of the addition of these two quantities, yields the astonishing quantity of 47,110,628,406,013 tons.—C. H. Piesse.

#### Mock Sun and Mirage.

About this time, last year, a mock sun was visible from Dover. This is a very rare phenomenon, and results from a reflection from clouds in the eastern horizon of the setting sun in the west, there apparently being two suns in the heavens at the same time. The atmosphere of the straits of Dover seems to produce these strange appearances in the sky, for a mirage was lately strikingly conspicuous at Dover. The dome of the cathedral and Napoleon's Pillar at Boulogne were to be seen from the Crescent Walk by the naked eye; but with a telescope of ordinary power the entrance of the port, its lighthouse, its shipping, and the surrounding houses, the valley of the hillside of Capecure, and the little fishing village of Portel were distinctly visible; while on the eastern side the principal features of the country, the lighthouse of Cape Grinez, the adjacent windmill, numerous farms and villages, with their windows illuminated by the setting sun, stood out with extraordinary clearness. While these were under observation, a locomotive was seen to leave Boulogne and travel some miles in the Calais direction, by its puffs and wreaths of white steam. Shortly after sunset the mirage subsided.—C. H. Piesse.

#### Movements of the Sensitive Plant.

M. Bert and M. de Blondeau have published in the *Comptes Rendus* some extremely interesting observations on this subject. M. Bert shows that the natural and regular movements of the leaves, which take place in the sensitive plant, are produced by a different cause from that to which the sudden contraction is due when the plant is touched by the fingers. M. de Blondeau's observations are exceedingly curious and well worth further examination. He submitted three plants to the influence of an electric current from a Ruhmkorff coil. The first he acted on for five minutes; when left to itself, the plant seemed prostrated, but after a quarter of an hour the leaves opened and it seemed to recover itself. The second specimen was acted on for ten minutes. The plant was prostrate for an hour, after which it slowly recovered. The third specimen was galvanised for twenty-five minutes, but it never recovered; and in twenty-four hours it had the appearance of a plant struck with lightning. A fourth plant was etherised and then exposed to the current. Strange to say, the latter had not any effect; the leaves remained straight and open; thus proving, says M. de Blondeau, that the mode of the contraction of the leaves of the sensitive plants is in some way allied to the muscular contraction of animals.



## POLYTECHNIC COLLEGE OF PENNSYLVANIA.

Reported for the Scientific American.

The Annual Commencement of this well known seat of technical education was held in the new and spacious Horticultural Hall, Philadelphia. It was attended by a large audience, comprising many of the leading manufacturers, iron masters, and officers of railways and mines, not only of that city but of the interior of the State. On the stage were grouped leveling and transit instruments, models and apparatus symbolical of architecture, mining, chemistry, and civil and mechanical engineering.

During the performance of a march by the Germania Orchestra, the procession, consisting of the Trustees and Faculty of the College, the reverend clergy and other invited guests, the alumni association, and members of the graduating and other classes of students, entered the hall, and advancing to the stage, took the seats assigned them. The Hon. John P. Vance, President of the Board of Trustees, announced the order of exercises, which were opened with an impressive prayer by Rev. Phillips Brooks, Rector of Holy Trinity Church, Philadelphia. The introductory address was delivered by Gustavus Remak, Esq., who drew a vivid picture of the great undeveloped industrial resources of the country, north, west, and south, and pointed to the polytechnic system of education as the true and proper means whereby such development may be economically secured. Graduates under that system in Europe were chiefly relied on as directors of her great industries, and now that the system had been successfully transplanted to America, those educated with its advantages were found to be most worthy of confidence, and were therefore more and more in demand. He then traced the history of the Polytechnic College of Philadelphia from the date of the incorporation fifteen years ago, and closed by congratulating the officers and students upon its steady and prosperous career. The recent establishment of the Preparatory School, which he said was the first American "Realschule," he hailed as another step toward the attainment of a high standard of polytechnic education in this country.

The degrees of the college were then conferred by the President of the Board of Trustees upon the gentlemen whose names are appended.

The charge to the graduates was delivered by Hon. Titian J. Coffey, whose address was a powerful and convincing argument in behalf of scientific education and against the too exclusive study of the dead languages, which now characterizes the usual college course. That course had remained unchanged for centuries. Meanwhile the labors of the learned had created the natural sciences. Skilled experimenters and artisans had discovered and invented, remodeling the material earth and elevating man. Yet the so-called classical course practically ignored all this progress and denied to its students that robust mental discipline which, severe though it be, the young investigator of modern scientific truth enjoys, as he feels it indeed to be the best training for the sharp conflicts of life. His observation is made acute, and from the habitual determination of the nicer characters of his specimens, he gradually learns to discriminate between men. His imagination finds scope in the theories of chemistry and the study of the imponderable forms of light, heat, and electricity, and his reasoning powers are matured as he solves the sublime problems of terrestrial and celestial mechanics. Mr. Coffey denied that the classical course was the best training for the literary man, and cited in proof a list of the most vigorous, powerful, and influential writers and thinkers of modern times, and adduced the testimony of the first educators and scientific men of Great Britain in behalf of his position. In his closing charge he spoke of the great cause which the graduates had to be proud of the college, and instituted a comparison between their advantages and those of European graduates.

The following is a list of the graduates, of the technical schools in which they studied, and the subjects of their graduating theses:

## I.—SCHOOL OF MINES.

## DEGREE OF BACHELOR OF MINE ENGINEERING.

1. Edward H. Hughes, Newberry, S. C. Origin and Use of Coal.
2. Samuel Hunt, Catasauqua, Lehigh county, Pa. Preparation of Ores.
3. William J. Joffe, Virginia, America's Silver Amalgamation.
4. Richard Lewis, Trevertown, Northumberland county, Pa. The Ventilation of Coal Mines.
5. Gratz Mordcael, Philadelphia, Pa. Preparation of Fuel.
6. Gilbert H. Van Allen, Danville, Montour county, Pa. Metallurgy of Iron.

## II.—SCHOOL OF MECHANICAL ENGINEERING.

## DEGREE OF BACHELOR OF MECHANICAL ENGINEERING.

1. Murray Bacon, On Lubricants.
2. Harry B. Salkeld, Mauch Chunk, Carbon county, Pa. The method of Constructing Steam Boilers.

## III.—SCHOOL OF CIVIL ENGINEERING.

## DEGREE OF BACHELOR OF CIVIL ENGINEERING.

1. John Israel Bishop, Columbus, Burlington county, N. J. Tabular Bridging.
2. Alfred Augustus Curtis, Newark, New Castle county, Del. Under-water Foundations for Bridges.
3. Henry Freedley, Jr., Norristown, Montgomery county, Pa. Iron-girder Bridges.
4. Benjamin P. Howell, Jr., Woodbury, Gloucester county, N. J. Limes, Mortars, and Cements.
5. Samuel H. Ladd, Woodbury, Gloucester county, N. J. Ventilation of Buildings.
6. Herman H. Mund, Philadelphia, Pa. Stone Masonry.
7. Emilio V. Munoz, Santiago, Cuba. Construction of Canals.
8. F. H. Oltmann, Jr., Spring Hill Furnace, Fayette county, Pa. Tunneling Through Rock.
9. Amos M. Shuster, Frenchtown, N. J. Construction of Roofs.
10. Joseph E. Thropp, Valley Forge, Chester county, Pa. Detaching Rock.
11. R. B. Van Dusen, Knoxville, Tioga county, Pa. Permanent Ways.
12. Rowland Whitman, Philadelphia, Pa. Suspension Bridges.
13. A. D. Wright, Farmington Center, Tioga county, Pa. Common Roads.

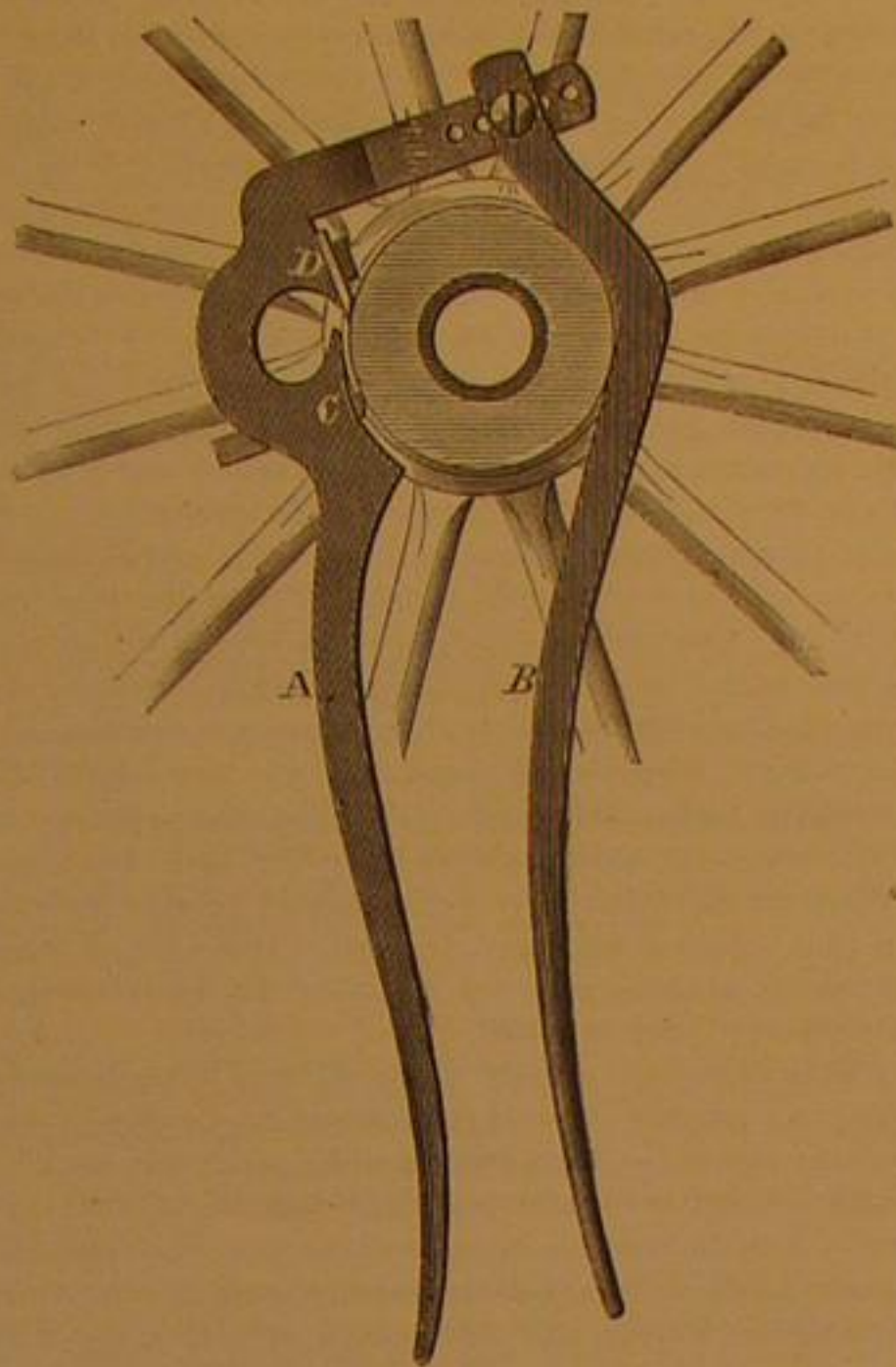
The Master's Degree was conferred upon the following graduates of three years' standing:

Master of Mine Engineering, on Price Wetherill, mining engineer, Mahanoy City, Pa.  
Masters of Civil Engineering—Jonathan R. Jones, C. E., Conshohocken, Pa.; Henry H. Corson, C. E., Plymouth, Pa.

THE Scientific Association at Chicago adjourned on the 12th inst., after the usual resolutions of thanks to all concerned, and the election of Prof. J. W. Foster, of Chicago, as President of the next meeting, to be held August 16, 1869, by invitation, at Salem, Mass.

## STONE &amp; HERBERT'S PATENT TOOL FOR FITTING HUB-BANDS.

The simplicity of this tool is such that the practical carriage maker or wheel-wright will understand at once its action and operation, by an examination of the accompanying illustration. It is intended to save the clipping with mallet and chisel usually practiced to fit the hub of wagon wheels to the band. The implement consists mainly of two handles, A, having a right-angled arm to which B is pivoted by means of a bolt. B is sufficiently bent to bear at two fixed points on the perimeter of a hub, whether it be large or small, and A has also a concave face for the same purpose. To further adapt the instrument to varying diameters, the handle, B, may be set nearer to or farther from the other by shifting its pivot bolt, for which purpose the arm of A is furnished with



a series of holes. C is a marking or scribing cutter, and D, a chisel; both adjustable by means of set screws and slots. In operation the wheel is swung and revolved while the workman holds the tool on the hub.

Patented through the Scientific American Patent Agency, July 14, 1868, by Charles E. Stone, Amesbury, Mass., and Alfred Herbert, Salisbury, Mass. For the entire patent, State rights, or further particulars, address either of the patentees, box 163 Amesbury, Mass.

## Correspondence.

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

## The Union Pacific Railroad Company.

MESSENGERS. EDITORS:—Have you space for a brief article upon the Union Pacific Railroad, and the country which it traverses? I am prompted to write this for your columns, because, having recently traveled over that railroad for a distance of seven hundred miles west from Omaha, and having seen every mile of it by daylight, I am qualified to speak somewhat strongly of its character, and to emphatically deny some of the charges that have been made against it. I was one of the editorial party of thirty who have recently returned from the end of the line, and who were given the fullest opportunity possible for thorough investigation into the construction and management of the road.

I have spoken of charges made against the character of the road. Evidently some of these charges are prompted by prejudice, and more by utter ignorance of the subject. It is not long since a prominent newspaper published a letter of complaints against the Union Pacific Road, the strong points of which were that the bridges were made of pine! and were actually built without arches! The blundering letter-writer was right—the bridges are built of pine, which you know to be the best bridge timber in the world, and every one of them is a Howe truss bridge, whose peculiar strength lies in the fact that there is not a sign of an arch about it. I have now before me two letters published in a Brooklyn paper, evidently written by one person. These have sundry charges against the Union Pacific Railroad, a part of which are frivolous, and others more tangible. Let us see what foundation the writer has for his denunciations.

A large part of the letters is taken up with sneers at "dead-heads," who go over the road at the expense of the company, and are charged with being thereby bribed to tell a flattering tale. I suppose he would include our whole party under that head, because we were invited by the agents of the railroad company; so let us see what our circumstances were. Every invitation to join the party said, in substance, "send some gentleman of sound sense and good judgment, who can state clearly the condition of things as he sees them, and who can criticize intelligently, if he finds occasion to do it at all." In response to this invitation, we had gentlemen of a standing and repute not to be bought up with good eating or comfortable quarters, if such a thing had been desired. Then, the gentlemen in charge of the party, and who represented the railroad company, took a special train

from Omaha, which went fast or slow as was desired, which stopped whenever it was desired by the guests, to examine the road or its surroundings, and which passed over the entire line by daylight, either going or returning. Hence the members of the party had a far better opportunity for seeing the exact character of everything pertaining to the road than the writer referred to, or any traveler by ordinary trains could have. What was the verdict? Hon. Charles A. Dana, editor of the New York Sun, is a credible and responsible witness; and he speaks the sentiment of the entire party when he says:

"Their unanimous opinion is, that the road is constructed in the most thorough and solid manner, and that it is superior in firmness, smoothness, and capacity, for rapid running, to any other new road which they have ever seen. The work is well done, both as respects the judgment with which it is laid out, and the thoroughness of its construction; and there is no part of it which could, under the circumstances, be better than it is. All reports to the contrary are erroneous and mistaken."

The critic referred to says that he anticipated seeing "marvelous cities, beautiful villages, and delightful settlements," all along the line, and seems to have been surprised to find a congregation of bad characters at Cheyenne. Then, he must have known less of the inevitable character of a new country than men of ordinary sagacity. To expect to find New England or eastern Pennsylvania towns in a region just opened to civilization, one or two years ago, shows a credulity which deserves disappointment. But Cheyenne, Laramie, and Benton, have successively deserved the title of "marvelous cities," or villages. There is not a pleasant nor an attractive growth to an eastern man; but Omaha on the one side, and San Francisco on the other, have both passed through similar experience, before law and order succeeded the reign of vice and violence. For one, I have never yet seen any description, even from a "dead-head," of these places, which represented them to be the abodes of peace. The tendency has invariably been to exaggerate their lawlessness, and make the hair of a timid man stand on end at the thought of visiting them.

In regard to the road itself, the paragraph I have quoted above expresses just what we all felt after thorough examination. On our return, we made the run from North Platte to Omaha, a distance of two hundred and ninety miles, at an average rate of over thirty-four miles an hour, and ran fifty-five miles in one hour. No railroad officer in the country would dare do that, or suffer it to be done upon his road, if the latter was not in splendid condition. This portion of our trip was made with as much comfort to us as any other part of the whole run from New York to the Rocky Mountains; and I claim that this one fact will convince any candid man that it is a gross libel to speak of "the miserable and absolutely unsafe manner in which the road is constructed." Here are some of the details of construction: The iron is of the very best American manufacture; the ties number 2,650 to the mile (the average upon the railroads of the country is about 1,700); the rails are all joined by "fish-plates," of a pattern approved by the best railroad engineers; the road is being ballasted with broken stone brought from the Black Hills; the culverts are now made of substantial timber, which would be good for ten years' wear; but the contract is already made for immediately replacing them with heavy dressed masonry. The equipment of the road is superb. The locomotives are of the best Taunton, Providence, Trenton, and Paterson make; while the freight and passenger cars, which are turned out from the company's own magnificently appointed shops at Omaha, are equal in every respect to any that I have ever seen in the course of many years' active traveling. These shops, by the way, cover eight acres of ground, and are manned by about one thousand intelligent artisans, who have all the advantages that the most perfect tools and machinery can give them.

The perfect, almost military discipline, which pervades all the vast operations of the company, is noticeable and pleasurable. Especially is this apparent at the end of the track, where four hundred men are engaged in the track-laying, where every man knows so exactly his place in the grand human machinery, and so promptly and energetically fills it, that no possible improvement can suggest itself. It would take more words than you have space to print, to adequately describe this wonderful march to the western sea.

But I must stop. The theme is inspiring; but there remain all the future ages in which to recount the worth to the country of the Union Pacific Railroad, and the honor due to those men of brains and energy, and indomitable pluck, who have conceived and are so grandly executing this national undertaking.

Let me close with another quotation, this one from the practical, unimpulsive Baltimore American:

"It is proper to say, just here, that the rumors which have been put afloat at the east, that the company is a party of speculators putting down a rude and poorly constructed road, that will be useless, or nearly so, when completed, are falsehoods which could have only been concocted and put in circulation for purposes that would scarcely bear examination. The road is a good one, well and solidly laid, with heavy rail, and twenty-six hundred cross-ties to the mile, over which the cars travel with remarkable smoothness; and the equipments, station-houses, and work shops, all show that it is being built for use and not for speculation."

S. D. P.

## Algebra—Mathematics for Mechanics.

MESSENGERS. EDITORS:—In your issue of the 5th inst., I was quite surprised at the remark of Mr. Horace Greeley on the study of algebra, and quite indignant your opinions on the subject. Any one who knows anything of the study of mechanics, must know that a previous knowledge of geometry and algebra is indispensable to acquire its principles. But, laying aside the question of its after utility, to say its study will clog the brains, is an assertion, which, I think, the writer would retract after mature consideration; for the more one studies, the more is the capacity of the brain for storing



knowledge increased, and the more subjects are opened to one's view as he proceeds, he feels his ignorance, and is thus nerved for stronger efforts to gain the upper branches of the tree of knowledge. In the majority of schools, boys are taught geometry before they have chosen a profession, because it teaches them to reason logically, and expands the mind by causing them to use their common sense; and in the same manner algebra shows them how labor is saved and time gained by the use of symbols, and by preserving a method in all their work, so that if they do not require a knowledge of these subjects in after life, they will have improved the mind so as to ever benefit them. In preparing engineers for the British navy, the plan adopted is, to see that they have a thorough knowledge of geometry and algebra, and with this good groundwork to build on, they take trigonometry, mechanics, and chemistry, hand in hand, as they advance taking the higher branches of mathematics, so that in the end, they have often as good a knowledge of all branches of mechanics as those who have studied at the universities. At the same time, they have a complete knowledge of practical engineering, which, together with the theoretical, makes them fully fit for their arduous duties at sea. J. H. RICKARD.

Clifton Springs, N. Y.

#### Electro-Magnetism as a Motive Power.

MESSENGER EDITORS:—I notice in the SCIENTIFIC AMERICAN of July 8th, under the head, "The Impossible in Constructive Science," a well written article from the *Engineer*, in which "Electro-magnetism as a motive power" seems to be very summarily disposed of. Believing that the ideas set forth in said article are calculated to have a tendency to check the ardor of some who are endeavoring to produce a motive power safer and in all respects more desirable than steam power, I propose, with due deference, to offer a few remarks.

*Engineer* says that "we now know that nothing can be expected from electro-magnetism as a motive power," and that "all the power which an electro-magnetic engine can produce is represented by the oxidation of a given weight of zinc." But what electro-magnetic engine? Henry's, Page's, Vergne's, Wickesham's, or Stewart's? Because each of these will give a different result with a given current. Could the power of steam be definitely ascertained by experimenting with the engines of Hero of Alexandria, Blasco de Garay, the Marquis of Worcester, Denis Papin, Captain Savery, or even of Newcomen? And yet the power of steam was as great 1,000 years ago as to-day. The arrangement of James Watt simply developed a greater percentage of the power of steam than those of his predecessors. Now it is highly probable that the best electro-magnetic engines do not develop one per cent of the electro-motive force, and are in fact mere whirligigs, like the *atopile*, showing something of the velocity with but little of the force of the current.

*Engineer* says it is far more economical to burn coal to store up power in water than to burn it to store up power in zinc. Now the electro-magnetic force is derived from the oxidation of pure zinc, which is obtained from the ore by the combustion of coal. The duty performed by the coal being simply to drive off (not store up) foreign matter, and not oxidize the zinc—a pound of pure zinc giving the maximum of electro-motive force, the combustion of coal being at the minimum (or rather, nothing). So that it is easy, even for an unlettered man, to see that there is no connection or relation whatever between the power represented by the oxidation of a given weight of zinc and the coal necessary to produce the zinc from the ore.

*Engineer* says "that the discovery of the conservation of energy dashed the hopes of the inventor to the ground." But why so? What is the amount of coal necessary to oxidize one pound of zinc? Zinc melts at 773° Fah., and at a considerably higher temperature passes off slowly in the form of vapor. More than one hundred pounds of coal would be required to oxidize one pound of zinc, equal to twenty-five horse-power per hour. But again, Miller, in his work on electricity and magnetism, states that, "from the experiments of Weber it may be calculated that if the whole of the positive electricity required to decompose a grain of water were accumulated upon a cloud 1,000 meters (3,281 feet) above the surface of the earth, the attractive force exerted between the cloud and the portion of the earth beneath it would be equal to 1,497 tons." Now, to decompose one grain of water, 3.63 grains of zinc are required, and the electricity derived from a pound of zinc and situated as above would give an attractive force of 2,384,742 tons! JOHN CLARK.

#### Removing Shellac from Watchmakers' Lathes.

MESSENGER EDITORS:—A steady mode of dissolving shellac upon watchmakers' lathes is needed. The article turned is taken off by the heat of a lamp, and some substance, liquid or solid, which would, with or without heat, soften the shellac, so that it could be quickly removed with the brush, would be a desideratum. Alcohol is used, but it is too slow.

[We know of no ready solvent of shellac that will not act chemically upon metals, except alcohol. Shellac dissolves easily in dilute muriatic and acetic acids. By the aid of heat it is also easily dissolved, by a solution of borax. If any of our correspondents know of anything better than alcohol, we shall be glad to hear from them.—EDS.]

#### Mode of Dividing Glass.

MESSENGER EDITORS:—The following plan, to break a bottle or jar across its circumference, so as to form a battery cup or vessel for other purposes, may be of some service to your readers. I have performed the operation successfully many times. Place the bottle in a vessel of water, to the height

where it is designed to break it; also fill the bottle to the same level. Now pour coal oil inside and out on the water; cut a ring of paper, fitting the bottle. Saturate with alcohol or benzine, so that it touches the oil. Pour, also, some inside the bottle. Set on fire; the cold water prevents the glass from heating below its surface, while the expansion caused by the heat will break the vessel on the water line.

J. T. PEET.

#### PHYSICAL STRENGTH.

The common idea in regard to physical strength is that it depends solely upon the amount and quality of muscle, bone, and sinew. In the training of athletes for the performance of physical feats the prominent features are the means for development of the muscular tissue and the inuring of muscles to severe work, so that the soreness which results from the extraordinary exercise of the body not thus inured, shall no longer be a sequence of physical exertion. This is right so far as it goes. Development of muscle, strength of bone, and firm elastic sinews are essential elements of strength as well as endurance, but they are by no means all. Were that the case, strength could be estimated by weight approximately. But the facts are that many small men having no superior training or no better apparent health, have often been more than a match for larger men. The strongest man with whom we were ever acquainted, never weighed over one hundred and fifty pounds. We might tell some large stories of the feats of this remarkable man, but the point which we wish to make will be sufficiently illustrated without any such particulars. The peculiar feature which always forced itself upon our attention when he was powerfully exerting himself was his perfect placidity of countenance, and the want of that turgid congested appearance of the face which often accompanies such exhibitions. Further the muscles not specially employed never exhibited rigidity, as is often seen in feats of strength, but were soft as though he were reclining at his ease. Except he was doing some labor which caused much motion of the muscles of the chest, he never appeared to be "winded," as it is called.

We have often set ourselves to the solution of the reason of the different degrees of strength possessed by different individuals, or rather, we have attempted to get at the secret of strength which lies back of bone and muscle, and we have no doubt it is the peculiar exercise of the will: the concentration, so to speak, of the nervous energy upon one muscle or set of muscles, without the distribution of it to muscles not concerned in the act to be accomplished. This was proved in the case alluded to by the fact that in feats which involved the exercise of nearly all the muscles, his power was not so conspicuous. In special feats, as for instance the raising and sustaining a heavy weight at arms length, his great strength, and also the concentration of will to which we have alluded was most conspicuous. This man's strength was undoubtedly to be attributed to his shortness of limb in some degree as, with equal development of muscle increased length of bone is a disadvantage. Each bone in the animal frame is a lever, and the muscles are so attached that the motion they impart to the bones is multiplied through its transmission by them to weights or resistances. Too great length of bone in proportion to amount of muscle is not conducive to superior strength although it adds to fleetness. The differences in the structure of the bulldog and the greyhound are good illustrations of this fact.

The elements of physical strength may then be stated to be in healthy subjects, development of muscle, strength of bone and sinew, small relative length of bone in proportion to muscle, and power to concentrate exclusively upon the muscles employed the nervous energy which produces contraction. There is no doubt that this power can be cultivated, like other powers by proper discipline; and if those who are obliged to lift heavy weights or to make other great exertion at times, would bear this in mind, they would be enabled to accomplish their labor with less exhaustion than is at present the case. The view here taken of the concentration of will seems to be sustained by the opinions of the eminent chemist and physiologist, Liebig, who states that it is just as impossible by the combustion of a piece of dried muscle to calculate its efficiency in the living body (the assumption of some physiologists), as it is by the combustion of a dried bee to estimate the work which it accomplishes in its flight of many hours, carrying the weight of its own body several miles.

The muscle in a living body acts like the apparatus in a watch which gradually expends the power stored up in it; a freshly severed frog's leg represents an apparatus of this kind with an escapement, while the newly removed heart of the same animal corresponds to one without any escapement; the frog's heart beating for hours together just as in the living body, while the frog's leg moves as soon as an irritant sets it for a moment free from the escapement, and if small weights are hung on them, it is possible to obtain work from a pair of severed frog's legs; that is, the weights will again and again be alternately raised to a certain height, without blood or the supply of any kind of nutriment.

It would seem from these statements that the muscles are to be considered merely as vehicles of a force which is imparted to them. This force—the nervous energy, whatever that may be—must of course become sooner exhausted, and also lose in immediate efficiency by being distributed to muscles not required for the performance of any specific work.

#### The Chicago Savans.

The American Association for the Advancement of Science, out of gratitude for the hospitality shown them by the citizens of Chicago, admitted to membership some two hundred

prominent business men, lawyers, hotel keepers, pork packers, and so forth. A writer in the *Chicago Tribune* makes this a subject of sport in a very humorous "take off," in which these gentlemen are regarded as professors, reading papers upon the subjects peculiar to their several occupations. We extract the following, which show the satirical humor of the article:

"In looking over the list of the Chicago savans, who can help being proud of the contributions they will make to the scientific knowledge of the world at their first meeting, the record of which will undoubtedly appear in the daily press somewhat after the following fashion:

"The session of the American Scientific Association was one of peculiar interest, from the large number of essays which were read. Professor Jerome Beecher read a paper on the relations between gas and dividends, showing that the pre-historic man never received any profits from its illuminating properties and that Solomon was quite irregular in paying the gas bills of the Temple.

"Professor Edward Ely then occupied the attention of the association with a paper upon coats and neck-ties, illustrated with diagrams, in which he proved conclusively that the automaticity of the torso of a coat (that is, a coat without a tail or sleeves), was equivalent to one atom of an element in a coat with a tail, united to one or more atoms of a second hand coat; and that the moral influence of the fluctuations of a neck-tie upon a well regulated mind could hardly be computed.

"Dr. Clinton Briggs gave the algebraic formula, starting on the basis of  $x$ , which keeps Merchants' Union stock at 24. This view was also corroborated by an able paper read by Professor C. B. Farwell. Professor C. M. Cady delivered an oral argument proving that a Steck piano had been dug up underneath the skeleton of a mastodon in an alluvial formation, and that the skeleton of an aborigine was seated at it. From the position of the petrified fingers on the keys, he had discovered a chord in the touching song 'Let me kiss him for his mother,' thus proving the immense age of this ballad.

"Dr. George H. Dunlap, N. W. R. R., read an essay on the coming railroad from Chicago to the moon. He stated that Professor Perry H. Smith would probably locate himself at the moon terminus, to see that its perturbations did not affect the stock, and he had no doubt, moreover, that as soon as they settled the uncertainty relative to the moon's semi-diameter the stock would be at a premium. Telegraph stations would be under the control of the man in the moon—not Professor Smith, but the other man—and the stockholders would be given a free annual ride to the octants in the orbit, corner lots in which were now for sale.

"A recess was then granted, and the association lunched at the residence of Professor Dr. Dyer. During the informal conversation reference was made to the old slow coach days when Chicago had but one *savant*—the late Colonel Graham—and the famous Dyer story was revived. At a dinner party Dr. Dyer sat next to Colonel Graham. In response to a toast the Colonel arose and after paying his respects to the company, said he had an important discovery to make known. He had labored upon it for years, and had now arrived at the conclusion, after long scientific explorations and many anxious nights of study, that there was a tidal wave in Lake Michigan of at least one third of an inch. Dr. Dyer, who was sitting next to the Colonel, sprang to his feet and exclaimed, in utter amazement, 'Good God! Colonel, you don't say so. I always thought there was something the matter with that cursed lake.'

**OXYHYDROGEN LIGHT.**—The experiments commenced last year on the Place de l'Hotel de Ville, in Paris, on the oxyhydrogen light, are about to be continued by order of the Emperor, in the court of the Tuilleries. The magnesia cylinders having been found to corrode and waste away too rapidly for the purpose of a continuous light, an artillery officer, M. Caron, after experimenting with a variety of substances, has adopted zircon, a substance which Berzelius pointed out as infusible, and giving forth a very brilliant light under the blowpipe. It is said that M. Caron has had a cylinder of this substance in use with the oxyhydrogen light for a month without the slightest trace of volatilization. The luminous power of zircon, under the oxyhydrogen jet, is about one-fifth more than that of magnesia. The zircon employed is an oxide of zirconium; it is found principally near Minsk, at the foot of the Ural Mountains. M. Caron economizes the zircon by mounting a point of it on a small stick of magnesia or fire-clay, the zircon being made to adhere by compression and afterwards baking.—*Journal of Society of Arts.*

**MILK.**—The milk supply of this city comes chiefly over the Erie and Harlem Railroads. The Erie, however, brings the largest quantity. The milk train on this road runs out as far as Portersville, a distance of seventy-six miles from the city, and gathers up on each trip at the various stations about 3,800 ten gallon cans, the transportation of which yields a revenue to the road of nearly \$2,000 per day, and is probably the most profitable of all the fifty odd trains which daily pass over the eastern division of the Erie.

The milk train arrives at Jersey City a little past midnight, and from that hour until morning a string of milk cars are engaged in carting the milk away for distribution to the families in the city. The conductor assured us that the milk was delivered to the train perfectly pure, and if reduced at all by water it must be done by the milkmen after its delivery to them. Thus, while the denizens of the city are snoring in bed, the agencies employed in supplying their wants are going on with ceaseless energy, reaching to the furthest bounds of the continent.



## Recent American and Foreign Patents.

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

**GAS GENERATOR.**—Dr. W. E. Darrab, Baltimore, Md.—The object of this invention is to construct a simple and cheap burner which can be applied to any hydrocarbon lamp, and by the use of which a clearer, whiter, and steadier light can be obtained than from any heretofore brought into public use.

**APPARATUS FOR DRYING BRICKS.**—Wm. O. Leslie, Philadelphia, Pa.—Invention the bricks are dried, preparatory to placing them in the kiln, by being carried on a car into a drying chamber, and subjected to a dry air heated to about 90° Fah., thence passing to a second chamber in which the temperature is about 100°, thence passing to a third, where the temperature is 110°, whence they are taken to the kiln. The construction and arrangement of the drying chambers and heating apparatus are designed to regulate the temperature of the chambers and facilitate the drying of bricks.

**SELF RAKE AND REEL FOR HARVESTERS.**—F. Schurger and N. Allstatter, Hamilton, O.—This invention has for its object to improve the construction of harvester rakes and reels, so that they may be more satisfactory and effective in operation.

**DOUBLETREES, ETC.**—Horace Palmer and A. N. Case, Kingsville, O.—This invention has for its object to furnish a simple attachment for doubletrees, whiffletrees, neck yokes, etc., where the power is applied to the ends of a wooden bar, and the resistance is sustained at its centre, so as to greatly strengthen said bar without materially increasing its weight.

**AIR AND GAS CARBONIZER.**—M. P. Coons, Brooklyn, N. Y.—The nature of my invention relates to improvements in an apparatus for carbonizing atmospheric air or coal gas for illuminating, heating, and other purposes, by the use of petroleum oil, either in a crude state or in a refined state, in its several grades.

**SPIRIT METER.**—Joel D. Weaver, Troy, N. Y.—The nature of this invention relates to improvements in that class of meters for measuring fluids which consist of a piston working within a cylinder. It consists of an improved arrangement of mechanism for operating the valve.

**PARTNERS AND STEPS FOR MASTS OF VESSELS.**—D. S. Stevens and Lambert Smedecor, Red Bank, N. J.—The nature of this invention relates to improvement in means for supporting masts in vessels, the object of which is to provide yielding elastic supports for the same, whereby the strain upon them caused by the irregularly blowing gusts of wind will to a considerable extent be relieved.

**SHUTTLE-BOX MOTION.**—Michael Rice, Upland, Pa.—This invention consists in suspending the shuttle boxes on the outer ends of levers pivoted to the lay, from the inner ends of which are suspended balancing weights, and providing a vibrating wedge-shaped lever which is operated by a tappet wheel deriving motion from a pawl actuated by the driving shaft, which vibrating lever ultimately raises and lowers the outer end of the said shuttle-box levers.

**COMBINED BELT KNIFE, AND Mallet FOR PUNCHING BELTS.**—Henry Blake, East Pepperell, Mass.—This invention consists of a knife punch, the blade of which is formed in a shape particularly adapted to form the elongated perforations necessary for inserting the belt fastenings heretofore patented.

**STAMP MILL.**—Edmund Castle, Lincoln, N. C.—This invention consists, first, in providing recesses in the lower edges of the dies, and corresponding grooves in the bed plate opening into the recesses of the same in which the dies set, whereby a bent bar may be readily inserted to remove the dies from their beds; second, in the manner of joining together the different parts of the housing frame, and in the arrangement of a swinging gate and adjustable table to govern the delivery of the pulverized ore from the mill.

**BALE TIE.**—J. A. Shone, Holly Springs, Miss.—This invention relates to a new and improved method of tying or fastening the bands on bales of cotton or the bands on other baled articles.

**STENCIL PLATE.**—Eugene L. Tarbox, Nashville, Tenn.—This invention relates to plates through which letters or figures are cut for marking boxes, bales, and other articles called "stencil plates."

**CHUCK.**—J. S. Detrick, San Francisco, Cal.—This invention has for its object to provide a chuck for use on lathes in machine shops, and for other purposes, which shall enable the operator to move the center of his work without removing the chuck from the lathe.

**METALLIC BALE TAG.**—Norman C. Jones, Maltby House, New York city.—This invention relates to a new and improved method of marking and insuring the identification of cotton bales as well as bales of hemp, manufactured goods, and other commodities or goods which are usually confined by ropes, hoops, or ties of any kind.

**FURNITURE CASTER.**—Ezekiah Munroe, Fall River, Mass.—This invention relates to an improvement in casters for furniture, baggage trucks, and other purposes, and it consists in combining a friction roll with the caster spindle.

**ICE ELEVATOR.**—W. T. B. Read, Chicago, Ill.—This invention relates to a new and improved method of constructing machines for elevating ice in the process of filling in houses and handling blocks of ice in other situations where it is necessary to elevate the same.

**FOLDING STOVE AND BAKER.**—D. C. McNeill, De Witt, Iowa.—This invention relates to a new and improved method of constructing stoves whereby they are rendered more portable and easier of transportation, the stove being especially intended for camp use for soldiers, trappers, and emigrants.

**SECRETARY.**—Ezra A. Clearfield, Penn.—This invention consists in providing within a case a series of small cases of drawers or pigeon holes, suspended from rods which are connected at both ends to endless belts arranged upon pulleys at the top and bottom of the large case. The pulleys being actuated by a crank on the shaft of the lower set which projects through the wall of the case whereby the said interior cases may be moved away from or up to an opening provided in the outer case.

**HAND CULTIVATOR.**—Barnett Taylor, Forestville, Minn.—This invention has for its object to furnish an improved hand cultivator for cutting the weeds and stirring the ground between plants, whether of vegetables, grain, or trees, planted in rows or drills.

**SIEVE.**—Mrs. J. D. Jones, Jersey City, N. J.—This invention has for its object to furnish an improved sieve, designed to take the place of the cullenders, sieves, and coarse cloths that are now used for screening and straining pumpkins, apples, etc., and materials for cassups, jellies, etc., which shall be simple in construction and effective and convenient in use.

**MACHINE FOR TINNERS' USE.**—Walter Forshee and Jesse L. Judd, Marathon, N. Y.—This invention has for its object to furnish an improved machine for tinner's use, designed especially for cutting out darning work, such, for instance, as the sides of pans, dials, basins, etc., with dies, which shall be simple in construction, easily operated, effective in operation and readily adjusted to cut out work of different sizes.

**TINSMITHS' STAKES.**—A. W. Whitney, Woodstock, Vt.—This invention has for its object to simplify and improve the construction of tinsmiths' stakes, so as to make them more convenient and less expensive, only one standard being required for a great variety of stakes.

**WATER WHEEL.**—O. M. Pike, North Leverett, Mass.—This invention relates to a new and improved horizontal water wheel, and it consists in combining with the wheel a slotted cylinder or drum, constructed and arranged in such a manner that the cylinder is made to serve as a stop to the water and effectually prevent any water from passing through the wheel case except that which acts upon the buckets of the same.

**DRUM FLASK.**—Wm. T. Fry, New York city.—This invention relates to a new and useful improvement in drum flasks and has for its object the substitution of some cheaper material than leather, but equally as durable, to the exterior of the glass bottle.

**DEVICE FOR PICKING FRUIT.**—N. G. Hughes, Waynesburgh, Pa.—This invention relates to a new and improved device for picking fruit, and it con-

sists in a novel construction of the implement, whereby fruit may be picked from a tree with the greatest facility.

**CONSTRUCTING CAMS ON SHELLS FOR ROTARY BLOWERS.**—F. H. Root and F. M. Root, Connersville, Ind.—The object of this invention is, first, to avoid the necessity of boring out the interior concave surface of the shell or case; and secondly, to obviate the necessity of facing or planing the end or head plates of the case, both of which have always heretofore been done in cases of this kind, which requires the case to be cast in separate parts, while by this method the case is cast in one entire piece.

**CHURN.**—J. Stadler, Detroit, and G. M. Streng, Plymouth, Mich.—This invention relates to a new and improved method of constructing butter churns, whereby butter is more quickly and economically made, and consists of a churn having on the inside a rotating dasher, and provided also on the inside with shifting wings, moved by levers on the outside of the churn, whereby greater or less resistance is offered to whirling the contents of the churn.

**STEAM INDICATOR.**—F. T. Riegel, Philadelphia, Pa.—This invention relates to a device for indicating the pressure in steam boilers, and it consists in arranging a steam chamber in communication with the boiler, and providing the same with a yoke which is held to its seat by a yoke and weight.

**VALVE FOR WATER CLOSET.**—W. Smith, San Francisco, Cal.—This invention relates to a new and improved construction for valves for water closets, and more particularly designed for the kind known as the Hopper water closets.

**GATE.**—Manson F. Kent, West Union, Iowa.—This invention relates to a new and improved method of constructing gates, whereby the same are more easily opened and shut, and whereby the same are less liable to obstruction from heavy snow.

**PISTON PACKING.**—William Wilson, Galesburg, Ill.—This invention relates to a new and improved metallic packing for pistons, and it consists of a peculiar construction and arrangement of rings and points, whereby the packing is allowed to accommodate itself to a cylinder cut perfectly true or round, and requires less steam than usual to adjust it or set it out, and is also allowed to travel over counter bores with facility.

**POWER CRANE.**—W. T. Darfee, New Bedford, Mass.—This invention relates to a new and improved crane, designed more especially to be operated by steam or horse power, and for raising and lowering heavy bodies. The object of the invention is to obtain a crane of the kind specified, which may be operated or manipulated with the greatest facility, be simple in construction, not liable to get out of repair, and which may be constructed at a moderate cost.

**LOOM.**—John J. Switzer, Roxbury, Mass.—This invention relates to a new attachment to looms, which has for its object to instantly cause the stopping of the machinery as soon as one of the warp threads breaks. As threads frequently break during the weaving process; and as by their breaking much annoyance is caused to the weaver, and injury to the fabric, this invention will be of great benefit to all manufacturers of woolen and cotton goods, more so as it is easily applicable to all looms of suitable construction. When a thread breaks, on fine goods, it is not always discovered at once, and if the weaving is continued, the whole fabric is spoiled. This invention is a thread protector, so arranged and applied to any ordinary or suitable loom, that at any moment a thread breaks, the loom will instantly stop, and cannot proceed until the severed thread has been repaired by the attendant.

**TIN CAN.**—G. E. Hegerman, Brooklyn, N. Y.—This invention relates to a new tin can, which is to be more particularly used for the keeping and transportation of petroleum and other liquids. The invention principally consists in providing a cap for such can, which is to be closed by means of a screw plug, that can be removed when the contents are to be discharged. By means of this plug, the can may be opened and closed at pleasure; while the ordinary caps now in use are mostly such that they must be destroyed to open the can.

**PLATFORM SCALE.**—John Decker, Sparta, N. J.—This invention relates to a new platform scale, which is combined with a spring balance in such a manner that the weight of an article placed on the platform will be indicated on the spring balance. The invention consists in the use of a yoke shaped lever, which rests with its two ends upon stationary supports, while its middle is suspended from the hook or spring rod of a spring balance.

**TAILOR'S SEAT.**—Frederick Neubaus, Belleville, Ill.—This invention consists in providing the hinged back support of a tailor's seat, with an adjustable elastic gage, by which its degree of inclination can be regulated. This gage consists of a screw and spring so applied that the aforesaid result will be obtained. The invention consists also in so constructing the leg support with the bar that holds it, that the said leg support may be elastic and also up and down adjustable. The invention finally consists in bending the bar, that slides on the seat, and that supports the legs supports, so as to bring the leg support opposite the middle of the seat.

## Answers to Correspondents.

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

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

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

**G. W. C.**—If your friends are correct who think that a fly wheel can create force, it ought to do some work independently of any steam cylinder, and the "perpetual motion" is not a chimera, but a possibility within the reach of their inventive skill. The heavier the fly wheel the more force it will absorb when started, and give off when required; but the idea that force can be created by mechanical means, is opposed to theory, practice, and common sense.

**M. W. D., of N. H.**—To prevent condensation in a steam pipe laid under ground, a good plan is to place it inside another larger pipe, filling the intervening space with pulverized charcoal. The outside pipe should have its joints made water tight. We have seen this tried, and know it to be good.

**E. L. G., of N. Y.**—The particular information you want about crystals of alum, we cannot supply.

**J. G. K., of N. Y.**—Your article on Encke's comet is so purely speculative that we cannot find room for it in our paper.

**J. H. H., of N. Y.**—We do not believe in the "momentum" of steam as generated; the production of steam is a gradual process.

**S. C. T., of Colorado.**—How can I separate gold from cast iron when alloyed. Dissolve in "aqua regia" having a slight excess of hydrochloric acid. Add solution of protosulphate of iron and the gold will be precipitated in a metallic state.

**W. P. J., of Pa.**—Castile soap is colored with persulphate of iron, commonly known as green vitriol. To describe to you in full the process of manufacture, would take too much of our time and space. Otto on soap published by D. Van Nostrand, 122 Broadway, New York city, is the book you need.

**L. S. C., of Ill.**—On page 177, Vol. XVII., of the SCIENTIFIC AMERICAN, you will find a drawing of the device used on Grover and Baker Sewing Machine, with full description. By examining that description you will see a difference in mechanism from the device which you defend, which it will pay you to study. "First be sure you are right then go ahead."

**H. C. S., of Chicago.**—In running on a belt from a shaft 4 inches in diameter to a pulley 20 inches in diameter, the shaft making 350 revolutions per minute there should be no shock to the machinery. The best and quickest method of stopping cars, hitherto discovered is to apply the brakes directly to the wheels.

## Business and Personal.

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

**N. C. Stiles' pat. punching and drop presses, Middletown, Ct.**

**Siccochast** is a hasty drier for linseed oil, a new discovery by Mr. Asahel Wheeler, of Boston, Mass., which is deserving of the attention of all persons interested in paints. It has received the most critical examination by the United States officials of the Navy Department, and is recommended and adopted by them for general use.

The campaign novelty is a rich thing. Agents guaranteed \$30 per day. Sample 75c. Circulars free. Address J. H. Martin, Hartford, N. Y.

**A.P.S., of Me.**—Please send address to C. Howard, box 5078, postoffice, Boston.

Manufacturers of tub and pail machinery please send catalogue and price list to Redington, Nelson & Co., Whitewater, Wis.

Send circular of the best gas carburetor, without water or heat, to 555 Minor st., Philadelphia, Pa.

Wanted—the best wood knolling machine made. Also, good second-hand ash and blind machinery. Lingle & Son, Rock Island, Ill.

New Brick machine, patented 1868. Bricks dried without floors—spread on the grass or hillside; easily secured from rain; no washed bricks. For pamphlet, address, sending 25c., F. H. Smith, box 556, Baltimore.

The patent sweet fern and chemical lacing, as made by J. H. & N. A. Williams, Utica, N. Y., is far superior in quality and strength to any other belt lacing in market.

For sale—just finished—an 18x42 Wright engine. Address Merrick & Sons, Philadelphia, Pa.

For sale—the whole or a part of a paper mill, all new machinery. For particulars address L. A. Beardsley, Fredericksburg, Va.

Peck's patent drop press. Milo Peck & Co., New Haven, Ct.

Machine shop and foundry to let, well established. First-class tools and patterns, now running on cotton, woolen, and general machinery. Work for seventy-five hands. Ill health sole reason for leaving. A rare chance. Address H. H. Morse, Attorney-at-law, Rhinebeck, N. Y.

For sale—the patent right, in Great Britain, for perforated saws. The manufacture of these saws is now firmly established in the United States, and they are rapidly taking the place of all solid saws. Apply to J. E. Emerson, Trenton, N. J.

Send for description of Huntoon governor on entirely new principles. 103 State st., Boston, or 79 Liberty st., New York.

For descriptive circular of the best grate bar in use, address Hutchinson & Laurence, No. 8 Dey st., New York.

Millstone-dressing diamond machine, simple, effective, and durable. Also, Glazier's diamonds, diamond drills, tools for mining, and other purposes. Send stamp for circular. J. Dickinson, 64 Nassau st., N. Y.

Prang's American chromos for sale at all respectable art stores. Catalogues mailed free by L. Prang & Co., Boston.

For breech-loading shot guns, address C. Parker, Meriden, Ct.

**B.**—You will have no trouble with grease and dirt, and save much oil by using Broughton's lubricator and oil cups. Shaw & Kennedy, Buffalo, have them.

Westerman Iron Co., Sharon, Pa., wish to obtain a machine for testing hoop iron.

Match it. Four-Horse Portable Engines, complete, with Governor, Pump, etc., \$550. Other sizes in proportion. Hampson & Cope-land, warerooms, 89 Liberty st., N. Y.

## EXTENSION NOTICES.

U. S. PATENT OFFICE.  
WASHINGTON, D. C., July 22, 1868.

William Porter, of Williamsburg, N. Y., having petitioned for an extension of the patent granted to him on the 24th day of October, 1854, for an improvement in "Securing Lamps to Lanterns," it is ordered that said petition be heard at this office on the 19th day of October next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE.  
WASHINGTON, D. C., July 22, 1868.

Clara B. Snow, of Independence, Iowa, executrix of the estate of Harvey Snow, deceased, having petitioned for an extension of the patent granted to the said Harvey Snow the 21st day of November, 1854, for an improvement in "Presser-bar for Planing Machines," it is ordered that said petition be heard at this office on the 24th day of November next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE.  
WASHINGTON, D. C., August 3, 1868.

Chesley Jarnagin, of Bean's Station, Tenn., having petitioned for an extension of the patent granted to him on the 31st day of October, 1854, for an improvement in "Seats for Wagons," it is ordered that said petition be heard at this office on the 19th day of October next. Any person may oppose this extension. Objections, depositions, and other papers should be filed in this office twenty days before the day of hearing.

ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE.  
WASHINGTON, D. C., Aug. 3, 1868.

George Miller, of Providence, R. I., having petitioned for an extension of the patent granted to him on the 7th day of November, 1854, for an improvement in "Leather Banding for Machinery," it is ordered that said petition be heard at this office on the 28th day of October next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

ELISHA FOOTE, Commissioner of Patents.

U. S. PATENT OFFICE.  
WASHINGTON, D. C., Aug. 11, 1868.

George Crompton, of Worcester, Mass., having petitioned for an extension of the patent granted to him on the 14th day of November, 1854, for an improvement in "Looms for Weaving Figured Fabrics," it is ordered that said petition be heard at this office on the 26th day of October next. Any person may oppose this extension. Objections, depositions, and other papers, should be filed in this office twenty days before the day of hearing.

ELISHA FOOTE, Commissioner of Patents.



### Improvement in Device for Cleaning Grain.

The design of the machine shown in the engraving is to properly cleanse the grain from smut, straw, etc., before it reaches the grinding hopper, and it consists of a series of cones and fans combined. The grain is fed into the upper cone, A, and fans combined. The grain is fed into the upper cone, A, by the spout, B, which first delivers it to a vibrating screen—not plainly seen in the engraving—but which is driven by means of upright shaft and cam or tappet, C, bar, D, rock-shaft, E, and bar and connection, F. The outer shell of the cone, A, is of perforated sheet metal containing a corresponding sheet metal core mounted on an upright shaft, to which a high velocity is imparted. From this cone the grain passes to a fan blower directly under it, which separates the particles of smut and other foul matter from the grain and blows it out through the spout, G, conveying the grain by another spout to the scouring cone, H, having brushes fixed on its interior surface and containing a rapidly rotating cone, also furnished with brushes; the two sets arranged at such an angle, compared one with another, that they pass each other as the blades of shears. From this cone the grain goes to the blower, I, which drives off the remaining refuse through the spout, J. The grain in the blower, I, is delivered to another vibrating screen, worked in a manner similar to the upper one, and which may be made of such a grade of meshes, if desired, as to separate the kernels according to size. The lower ends of the upright shafts, which drive the inner cones by means of belts and pulleys, rest on suspended cross bars that may be raised to adjust the cores of the cones to the size and character of the grain to be operated upon, by means of screws, the handle of one being seen at K.

This improvement was patented June 23, 1868, by Carl Millar, Sandoval, Ill., who will reply to all communications relating thereto.

### Parton on Alcoholic Drinks.

We do not deem it necessary to offer any apology for the republication, from the *Atlantic Monthly*, of the able article from the pen of James Parton, on the use of alcoholic liquors, entitled "Will the Coming Man Drink Wine?" We consider this article to be so complete a review of the whole subject, both from a scientific and social point of view, and such a masterly plea against the use of alcohol in any form, that it is the duty of the press, without regard to its particular adaptation to the special features of individual publications, to give it as wide a circulation as possible, and thus aid in ridding the world of its greatest curse.

We shall publish the article in two installments, the first of which we give in this number, and we cannot too strongly urge the thousands of young mechanics who weekly peruse our columns, to consider well the points so ably established in this excellent essay; and use their influence and example in helping to uproot the evil of strong drink, which is the fruitful source of more misery and crime than any other cause on earth.

### OBITUARY.

#### DEATH OF A WEALTHY INVENTOR.

Edwin A. Stevens, died in Paris on the 7th inst., of rheumatism. Although for ten years he had suffered more or less from this complaint, his death at this time was unexpected. His father was a co-laborer with Fulton in the introduction of steam navigation, and Mr. Stevens early devoted himself to the study and improvement of marine machinery. The propeller screw was invented by his brother Robert L. Stevens, and his own experiments upon the double screw were crowned with considerable success. The Stevens Battery, to which the modern system of iron plating undoubtedly owes much of its origin, was built by these brothers. The estate known as the Hoboken property, was inherited by him, and by its judicious improvement he amassed an immense fortune, his estate being estimated at \$20,000,000. He was very highly esteemed by all who knew him, and by his death New Jersey loses one of her most influential and worthy citizens.

### FACTS AND CONJECTURES.

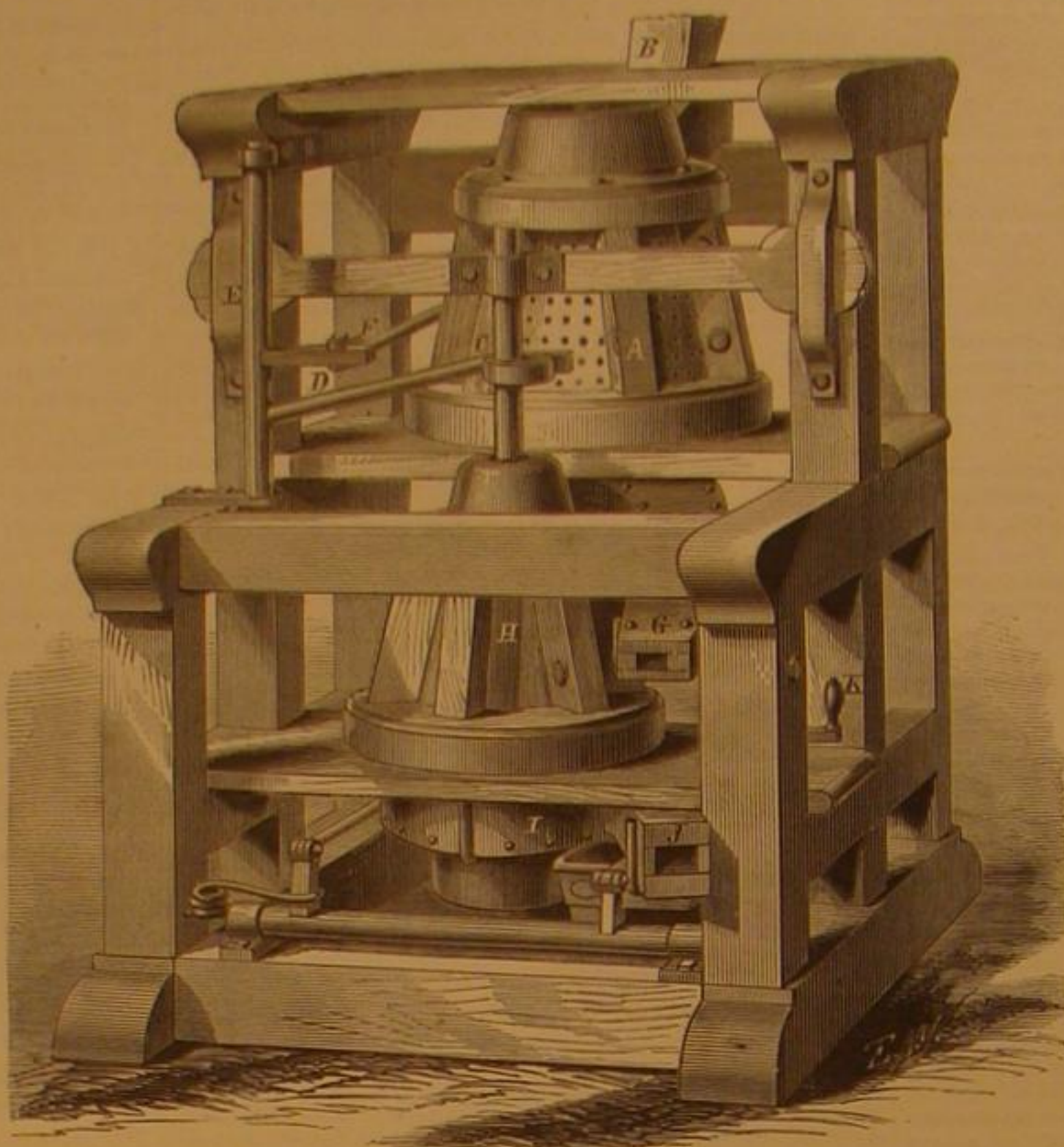
In looking over our exchanges, we notice a request from a correspondent to an agricultural paper for information as to how much lime or impurities, in running streams, would render the culture of trout unsuccessful. And he adds, "facts are what we want, not hypotheses." Ah, thought we, how much labor would have been spared the world if that had been made the rule in the past; if, instead of sitting down to frame conjectures as to what things might be, men had set themselves to work to ascertain what they really were. Most of our readers are familiar with the story of the dispute over the question why a bucket filled with water would not overflow when a fish was placed in it. The philosophers framed all sorts of conflicting hypotheses, and grew hot in the defence of their favorite theories, until it was wisely suggested that it would be as well to ascertain what was the fact in the case. When tested, it was found that when the fish was put into the bucket, the overflow took place, and the would-be philosophers were put to shame by a simple fact. Whether this story is a fable, or otherwise, it is a type of many disputes which have seriously engaged the minds of men, whose efforts, rightly directed, might have been of great value. It is only a very

few years since a learned professor in an American college set himself to show that all the facts of the universe, and its phenomena could be determined, *a priori*, and put forth to the world a system of cosmology fully as absurd as the conjectures of the above-mentioned philosophers in regard to the fish. An eloquent reviewer of this most absurd attempt to conjecture causes that would account for universal facts, writes as follows:

"Who that believes in such a philosophy would trouble himself to spend wearisome days and nights in studying the pages of Newton and Laplace? who would scale mountains

erators of even the cheapest sort are built in accordance with it. Ventilation is also frequently secured, at least in a measure. The refrigerator herewith illustrated is not claimed to be markedly superior to every other in these respects. Its main peculiarity and advantages are convenience in construction, compactness of form, and handiness in use. The latter quality is quite noticeable, as the shelves rotate so that the dishes of food can be readily placed in the receptacle, and when required to be removed present themselves successively at the door, obviating the necessity of soiling the dress in reaching over one dish for another.

The engraving exhibits the refrigerator in perspective with the door opened and a portion of the side broken away to show the interior. The outside, which is of an octagonal form, is of wood, as usual, and the inside of zinc, the space between being left either empty or filled with a non-conducting material as desired. The inside is of circular form in its cross section, and under the ice receptacle in the upper part has a series of slatted shelves supported on central pivots at top and bottom on which they turn. The ice is placed on a disk covered with zinc, the edges of which do not touch the inner surface of the refrigerator, but the disk is supported by lugs secured to the walls. The ice disk is double, and just below its lower edge is a gutter around the interior of the cylinder, to receive the drippings from the ice, which are conveyed through the bottom of the refrigerator to any convenient receiver by one or more pipes passing down by the inner wall. The cover is double and has perforated ventilators in each section which convey away the gases arising from the food. The slats of the shelves may be removed for cleaning. This unique contrivance is the subject of two patents obtained through the Scientific American Patent Agency, bearing dates, August 27, 1867, and July 7, 1868. Orders and applications for further information may be sent to the patentee, Anthony B. Sweetland, Fitchburg, Mass., assignor to himself and James Daley of the same place.

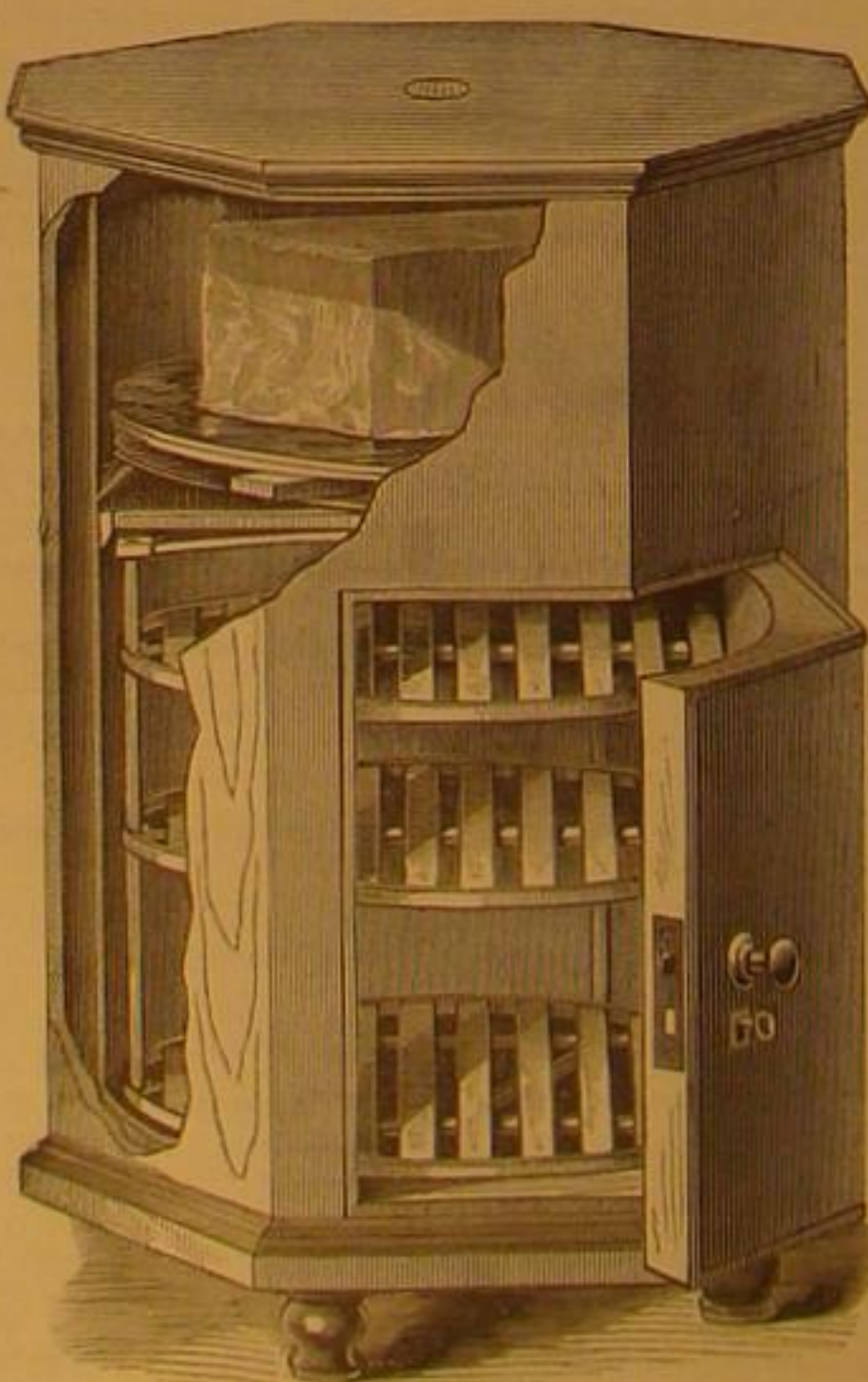


MILLAR'S PATENT SMUT MACHINE AND GRAIN CLEANER.

and penetrate into the frozen regions of the poles in search of knowledge? who would torture Nature in crucibles, drown her in acids, consume her in flames, stretch her upon racks, crush her under weights, in order to wring from her the secrets of her being, when he believes that all he can thus learn can be deduced from pure reason?"

The age for conjecture is past. "Facts are what is wanted," and hypothesis is worthless except as it leads the way to the discovery of realities. Less abstract speculation, less thought upon the imaginary, and more work, more attention to the real, the tangible, and the practical, is the tendency of the time.

### SWEETLAND'S PATENT ROTARY SHELF REFRIGERATOR.



The principle of the preservation of ice in refrigerators, that of prevention of rapid evaporation by inclosing it within non-conducting walls, is generally understood, and refriger-

### Are Locusts Poisonous?

WE find a number of items in the newspapers this year claiming that locusts, their bite, sting, or eggs, are poisonous. In Georgia it is stated that a young lady lost her life by rubbing her teeth with a twig (of *cornus Florida*, probably, as that is frequently done) in which a locust had deposited its eggs. And somewhere in the West, fishes are said to have been poisoned by berries in which locusts had deposited their eggs, and which had fallen into a stream. And the following items we find in the papers:

"Locust eggs appear to be very deadly in their poisonous effects. A party of little boys was recently killed by eating mulberries in which they had been deposited, and so rapid was the work of the poison that they died under the trees from which they took the berries.

The death of a little girl at Kimmswick, Mo., resulting from the sting of a locust, is noted by the local papers."

Now, "e'en from our boyish days," in the south and southwest, we were familiar with all kinds of locusts, handled and played with them constantly, and knew other children to do the same, and the worst thing we ever knew or heard about them was their intolerable music. This idea of their being poisonous is a new one to us—but, then, this is Presidential year, and it may be that the locusts have become inoculated with the "poison of politics," hence the trouble!

If, however, the locust is really poisonous, it should be known, and our readers will confer a favor by reporting their observations on the subject.—*Medical and Surgical Reporter*.

### The Union Pacific Railroad.

We draw attention to the article from S. D. P., in this issue, relative to this great international work. Being well acquainted with the writer, knowing his superior means of information, and having the utmost confidence in his honesty of purpose, and facilities for obtaining facts, with a talent for presenting them as they really are, we commend his article to our readers as a fair statement of facts which may have been more or less distorted to serve the purposes of stock gamblers.

JUDGE B. F. JAMES, of Illinois, recently appointed Examiner-in-Chief of the Patent Office, has received his commission and entered upon the discharge of his duties. Judge James, for the past seven years has been Principal Examiner in the class of civil and railroad engineering, and his long experience qualifies him for the position to which he has been appointed. The notice of this appointment was accidentally left out of our last week's issue.

In boring an Artesian well at Chicago, a vein of water was found at the depth of 1,200 feet. The direction of the flow was ascertained by lowering into the bore, by means of a fine wire, a long lead plummet. The weight would descend steadily until it reached the stream, when it would be suddenly jerked in the direction of the flow.



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## SOME THINGS A MECHANIC SHOULD KNOW.

Subdivision of labor insures skilled work, but the confinement of the mechanic's knowledge to one single manipulation detracts from his usefulness. This apparent paradox is easily explainable. Take the pattern maker as an example. The department that prepares his work is that of the draftsman; that which perfects or ultimate it is that of the molder. Now, although it may be true that the "Jack at all trades is good at none," yet he who understands, at least in a measure, the design or intention of the workman who is his predecessor in the chain of industry, and the duties and needs of him who follows his work, is more capable than the workman who can only mechanically use the tools of his craft. He will not only do his work intelligently, making a perfect job, but will be able to ascertain imperfections and detect omissions in the work of those who preceded him, and suggest, at least, by his own work, the proper method for those who succeed him.

Confining ourselves to the pattern maker, let us see the difference between the workman who knows merely how to get out his stock, prepare the pieces, and put them together in a workmanlike manner, and the workman who conceives and understands the design of the draftsman as imaged on the sheet before him, whether shown in perspective, plan, or section, and knows something of the manipulations of the molder's art. In the one case, the workman must be overlooked, instructed, and guided in every move, by some one who has an educated intellect and understands the object of the work in hand. In the other case, the intelligent pattern maker goes coolly, steadily, and quietly to work, correcting defects, and possibly suggesting improvements. His work is always perfect, and he can be always be depended upon in emergencies. Give him a drawing and he knows the object and intention of the draftsman, perhaps taking time to ascertain them; but when he does understand, he needs no oversight, and when his work is finished it is correct.

There are comparatively few machinists who can work from a drawing. In one shop, with which we were formerly practically acquainted, the workmen at the forge and at the lathe were furnished with a model or pattern of their work, as much as the molders in the foundry. If these workmen had informed themselves, never so slightly, of the principles and practice of mechanical drafting they could have wrought intelligently from drawings. Yet the theoretical and practical knowledge so useful is seldom possessed, when it may be obtained by the devotion of a few hours of attention in the leisure every mechanic has.

Beside this partial knowledge of cognate branches of his business, which every mechanic could and should possess, some knowledge of a technical character, easily obtainable from ordinary school text-books, should also be added. A decent smattering of chemical nomenclature; a knowledge, however limited, of chemical combinations; some ideas of natural philosophy as applied to mechanics; a good acquaintance with arithmetic, including algebra, and a familiarity with the principles of geometry, the science of sciences and the foundation of all that is useful in the arts, should be possessed by the mechanic.

All these may be easily obtained. The way is open, the road easy, and the goal within the reach of all. Success attends endeavor, and success is possible to all. Skilled labor guided by educated brain—discretion, good judgment, common sense, and intelligence—is always a marketable commodity, bringing its full value to its fortunate owner, who may reasonably consider himself the possessor of present independence and prospective competence, and as such the peer of the most favored in the land.

## PROGRESS OF SUBMARINE TELEGRAPHY.

Very few not directly interested in marine telegraphy are aware of the immense progress in this art, or of the solid basis upon which success is predicated, not only of the cables already laid, but of others which are projected. No less than eleven cables are laid between the several islands of the British group connecting that country with Holland, Belgium, Denmark, and the different islands with each other. To these must be added the two cables between Ireland and America, which, in conjunction with the cables connecting Ireland to England and the continent, unite the two hemispheres.

The Islands of Zealand and Funen have been connected to the continent by Denmark. In the Mediterranean Sea there are several cables laid, and working perfectly. France is joined to England by three cables; Asia is in communication with Europe through two cables, while America has united all her possessions in the Atlantic and Pacific by these slender yet powerful bands. In the Indian Seas two cables are working, having stood the test of several years' service.

In the Mediterranean a cable is about to be laid connecting Nice via Corsica with Algeria; while appearances indicate that a new cable will shortly be laid between France and America. This cable will be laid in two sections; the first from Brest to St. Pierre, Miquelon, a distance of 2,688 miles, and from thence to New York, a distance of 950 miles. The time fixed for the completion of this great work is August 15, 1869. An English exchange in speaking of this cable says:

"The grounds upon which the projectors have found favor with the French and New York State Governments have been, chiefly, that the proposed cable will obviate the circuitry and delay incident to the present line; and will also lessen the existing liability to casualties. By the only route we now have not less than four submarine cables have to be employed, while the electric fluid has to perform four land journeys also before a message can be sent from the Continent of Europe to New York. There intervene—1, the North Sea, or the English Channel; 2, the Irish Sea; 3, the Atlantic; 4, the sea between Newfoundland and the American continent; while the wires have also to be carried across England, Ireland, Newfoundland, and, lastly, from the coast of British America southwards to New York. It is, perhaps, surprising that with this circuitry, messages are sent from Europe to the United States as quickly as they are; but there is no doubt that communication will be very much accelerated if, as is said, a merchant or banker at Paris will be able literally to speak into New York. It may possibly be a sanguine calculation that messages between those cities may then be sent and answered in half an hour, and that messages may be sent from Berlin or Frankfurt to New York and answered within an hour; but the difference of time must obviously be very great. It is thought also that the directness and simplicity of this route will very much diminish the chances of communication with America being from time to time put out of gear. Ocean telegraphy has now been carried to such perfection that there is more fear of mishap by land than by sea; and, in point of fact, during the last two winters, when we have several times been alarmed by a stoppage of messages, the explanation has in each case been that storms had blown down the land telegraphs, sometimes in Newfoundland, sometimes on the American mainland. From this danger, whatever it may amount to, the new line will be exempt. As the capital it will represent will, it is stated, be only £1,000,000, and as the working expenses, with only two stations (at Brest and at New York), ought to be very small, it is probable that this project will bring the luxury of telegraphing across the Atlantic within the reach of persons of very moderate means. A cable laid across the English Channel, from Falmouth to Brest, would also give us the benefit of it. It is understood that the new Atlantic cable will be ready for laying next June."

Improvements are being made, not only in the cables and apparatus used for telegraphy, but in the mode of transmitting messages. A newly invented system of telegraphing by code is announced in England. Numbers are used instead of letters, each number indicating a word or a phrase, the translation of the message into the numbers, and *vice versa* being done by clerks. A large saving of time and greater accuracy is claimed for this invention.

Nothing illustrates the general progress of the age so much as the rapidity with which the art of marine telegraphy has spread its lines through the deeps, thus annihilating distance and uniting the nations of the earth into a closer brotherhood.

## MINING AND TUNNELING BY MACHINERY.

During the protracted siege of Sebastopol, Capt. Penrice, of the Royal Engineers, devised a very ingenious machine for tunneling, but the siege was cut short before the merits of the invention could be thoroughly tested. Enough, however, was done to satisfy the inventor that he had contrived a really valuable thing, and since that time, in the face of much doubt and opposition, he has pushed forward the invention to a point where it promises success.

In April last Capt. Penrice called upon us in Paris, and, by the aid of drawings, fully explained his invention, at the same time he invited us to examine a working machine under construction at one of the large machine shops near the city.

The machine resembles a horizontal steam hammer, so modified that the head can rotate as well as strike. The piston is cast in gun-metal in a single piece with the head; the diameter in the 5-foot machine is 28 inches, and the stroke, which varies according to the nature of the rock being operated upon, averages 2 inches, and can increase to 4 inches. The diameter of the head is 5 feet, and this diame-

ter corresponds with the diameter of the level to be driven. The head is a disk, with so much removed as shall leave a Maltese cross, occupying about two-thirds of the area, the remaining third, being open, serves for the passage of the debris to the back of the machine. The entire field of these segments is covered with cutters, in the form of double chisels, and arranged concentrically from the center to the circumference. The piston moves in a cylinder of cast iron, with a flat bottom, and is furnished with a stuffing box in front, the steam being admitted from a secondary regulating cylinder. As to the rotation of the head, there is a transverse horizontal shaft, which, by means of two intermediate shafts, gives a slow motion to another shaft, inclined upon the piston perpendicular to its axis by a screw pinion gearing, with a helicoidal wheel fixed upon the piston by a couple of keys. The debris is drawn to the back of the machine, so soon as broken down, by a series of hoes attached to an endless chain, worked by wheels and pinions, and ample arrangements have been made for providing sufficient space on one side of the machine to enable the face to be reached when the renewal of the chisels or other circumstances require it.

A company has been organized to work the invention, and it is stated in the London *Mining Journal* that they are prepared to guarantee an average progress of twelve feet in granite, and eighteen feet in sandstone rock in 24 hours' work. With regard to the continuity of the working, the sole interruption will be that resulting from the removal of the blunted chisels and the fixing of fresh ones. The changing of the chisels will not, according to Capt. Penrice, occupy more than two hours. All that is necessary is to draw back the machine a few feet, so as to allow a couple of workmen to pass in front of the head through the openings to remove the worn chisels and replace them with new ones, two other workmen behind the head unscrewing and re-tightening the nuts.

A Commission appointed by the French Government have quite recently made a full examination of a six-foot machine now in operation in a quarry at Vaugirard, Paris, and have also seen it in operation there; and, although their official report has not yet been presented, the Commissioners have individually expressed their entire belief in the general utility and extraordinary capabilities contained in the invention. The machine has been at work nearly every day for the last seven or eight weeks, and up to the present time but one set of chisels has been used, and these have not even once been sharpened.

It is worthy of remark, in this connection, that the Emperor Napoleon, with an enlightened regard for the material prosperity of France, took a warm personal interest in this invention, as he has done in many other instances; an example worthy to be imitated by other rulers.

## THE AMERICAN SCIENCE ASSOCIATION.

This distinguished body has again held its annual session, and performed its usual amount of service to the world at large by the elaborate discussion of such subjects as the "Nature of Thought," "The Statics of the Four Types of Modern Chemistry, with Special Regard to the Water Type H<sub>2</sub>O," "The Chemico-Geological Relations of the Metals," "The Stratigraphical Relations of the Fossil Horse in the United States," etc. No doubt the savants have a pleasant time in cracking these hard nuts. Their meats are, however, too indigestible for the mental stomachs of the generality of readers.

It is but just to add, however, that some time has been devoted to more practical subjects, among which we notice "The Effect of Atmospheric Changes on the Eruptions of the Great Geyser of Iceland," by P. A. Chadbourn. The eruptions of the Great Geyser are known to take place more frequently in fair weather, and it has long perplexed travelers to find a solution for this singular phenomenon. Mr. Chadbourn stated that the Great Geyser is a tube ten feet in diameter by seventy in depth, surmounted by a saucer-shaped basin seventy feet broad and four feet deep. When an explosion takes place, the water in the basin, and two-thirds of that in the pipe, is projected into the air. The explosion is caused by the gradual heating of the water far above the boiling point. The water which replaces that blown out by the explosion, has a temperature of 212°. An explosion will again occur when the water at the bottom of the tube becomes heated to 266°. The reason why the explosions are less frequent in January than in August, is that cold water trickling through crevices mixes with the water at the bottom; and prevents the rapid rise of temperature which takes place at the latter period, when the surface is dry.

Prof. Whitney read a valuable paper upon "The Progress and Present Condition of the Geological Survey of California." He dwelt upon the importance of the work, and stated that a great deal of the coast survey work was a fraud on the Government. He also exhibited some fine maps of different parts of California.

An excellent paper was also read by John L. Hayes on "The Recent Contributions of Science to the Arts of Dyeing and Printing Woolen Tissues," which we can not do more than allude to. These latter papers are of the class demanded by the age and the public, and we trust that in the future proceedings of this and similar associations this fact will be borne in mind. People are getting to care less and less for abstract speculation; they want practical knowledge, and will be content with nothing else in this material age.

GRANITE, notwithstanding its exceeding hardness, splits as straight and clean as a chestnut stick. At one of the granite quarries of Maine recently, a block was split out which measured 100 feet long, 8½ feet wide, and 5 feet thick. It weighed over 800 tons.



# OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office.

FOR THE WEEK ENDING AUGUST 11, 1868.

Reported Officially for the Scientific American.

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

On filing each caveat.....	\$10
On filing each application for a patent, except for a design.....	\$50
On issuing each original patent.....	\$50
On appeal to Commissioner of Patents.....	\$50
On application for Renewal.....	\$50
On application for Extension of Patent.....	\$50
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On filing application for Design (three and a half years).....	\$10
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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 use 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.

**80,798.—EXTINGUISHER FOR LAMPS.**—Chas. E. Abbott, Malden, Mass.

I claim the lid, a, so hinged and supported that when the wick, c, is lowered the lid will fall over it and close the mouth of the wick tube, b, substantially as set forth.

**80,797.—WASH BOILER.**—Joseph Adams, Cleveland, Ohio.

I claim, 1st, The open frame or rack, f, in combination with the removable base, b, and boiler, all constructed and operating substantially as set forth.

2d, The apron, g, and base, b, in combination with the rack or frame, f, substantially as and for the purpose set forth.

**80,798.—PROCESS FOR DESULPHURIZING ORE.**—John F. Alexander, Shelby, N. C., assignor to himself and Peter S. Michie.

I claim the method, herein described of desulphurizing ores, by exposing them to heat in a closed vessel or retort, in contact with charcoal, graphite, or other carbonaceous materials.

**80,799.—SHUTTER OPERATOR.**—James H. Barker (assignor to himself and D. B. Nevins), Washington, D. C.

I claim the jointed bar, g, constructed in the form herein set forth, and applied to the window blind and casing substantially as and for the purposes set forth.

**80,800.—MILK CAN.**—James A. Bennett, Millerton, N. Y.

I claim, 1st, A milk can made with the hollow sheet metal jacket, g, forming non-conducting air chambers, between which jackets the can is exposed, for the purpose set forth.

2d, The removable band, m, in combination with the jacket, g, for covering the can between said jackets, as specified.

**80,801.—JOUCH OR CRADLE.**—A. E. Blood, J. B. Blood, and F. W. Pope, Lynn, Mass. Antedated July 29, 1868.

We claim, 1st, In constructing an infant's couch, the combination of the sides, a, a, in combination with the bows, b, b, substantially as and for the purpose set forth.

2d, Suspending a couch by elastic or spring hangings, so that it may be capable of vertical reciprocating movements, and also admit of being swung laterally, substantially as described.

3d, Arranging the trundle bar, g, in such relation to the couch that it can be raised to connect with and operate the same, and when not in use, to drop clear of the couch, and allow it to be swung laterally, substantially as described.

**80,802.—RECLINING CHAIR.**—Charles Brada, Charlestown, Mass.

I claim, 1st, The seat frame, b, resting loosely on the rear of the main frame, and connected with the foot rest, c, when constructed and operating substantially as set forth.

2d, The combination and arrangement of the pivoted back frame, i, g, the sliding seat frame, b, and the foot rest, c, when constructed and operating substantially as set forth, for the purpose set forth.

**80,803.—SUPPORTING ATTACHMENT FOR SAILS.**—Charles S. Brown, Falmouth, Me.

I claim the combination of the adjustable hook, E, and its runner, D, with the yard, A, such being to operate in the manner and for the purpose specified.

**80,804.—ELEVATOR FOR SHIP PANS.**—Oramus W. Burnham, Hillsborough, and Henry F. Burnham, Acworth, N. H. Antedated March 9, 1868.

We claim, 1st, The elevator, N, rods, h, b, h, cross, H, in combination with arm, C, and brace, D, lever, L, and standard, B, arranged substantially as and for the purpose set forth.

2d, The pan, G, in combination with the books, k, k, k, cross, H, substantially as and for the purpose specified.

**80,805.—MACHINE FOR SHARPENING HORSESHOE CALKS.**—Ensign A. Bushnell, Haverhill, Wis. Antedated July 18, 1868.

I claim the slotted adjustable cage, R, and loop, D, with the screw bolt and set screw, w, in combination with the solid spring, B, main stock and burr, E, as herein described, for the purpose specified.

**80,806.—HAT SPREADER.**—Alex. H. Cary, Groton, Mass.

I claim the combination of the rod, shaft, G, provided with arms, F, hand lever, H, links, E, levers, C, and spreader shaft, B, arranged and operating substantially as and for the purposes set forth.

**80,807.—DIE FOR MAKING THE CALKS FOR HORSESHOES.**—Ethan B. Cheney, South Boston, Mass.

I claim the dies, B, B', and C, C', or their equivalent, constructed and operating substantially as described, for the purpose specified.

**80,808.—BED SPRING.**—Henry F. Clark, Lowell, Mich.

I claim the bed bottom consisting of the double set of slats, F, D, when combined and arranged between the blocks, A, and operating with the independent cross pieces, E, and springs, C, in the manner and for the purposes described.

**80,809.—MANUFACTURE OF RUBBER AND OTHER COATED LATH AND FENCIBLES.**—John W. Cobb, Melrose, and Edwin A. Hill, Quincy, Mass.

We claim the combination of mechanism for spreading rubber or a vulcanizable material on a surface or cylinder, and applying the coating to cloth, in manner as set forth, with mechanism for vulcanizing the coating of rubber or vulcanizable material, while it with the cloth may be passing about the surface or cylinder on which the rubber or said material may be spread.

Also, the combination and arrangement of the steam jacket or heater, K, with the steam heating cylinder, A, and the two cylinders, E, H, arranged and connected so as to operate as and for the purposes specified.

Also, the combination and arrangement of the air protective space, r, the steam chamber, t, g, and the steam cylinders, A, E, H, arranged and connected so as to operate substantially in manner and for the purposes as specified.

Also, our process of applying rubber or vulcanizable material to a vulcanizable material, and vulcanizing such rubber or material after such application on a cylinder or roller in contact with the coating so spread, and vulcanizing it while on the cloth, and while the latter with the rubber or vulcanizable material may be passed about the cylinder, such vulcanizing of the rubber or its equivalent being effected by heat applied to the cloth, or to the steam used in the process of spreading the rubber, as set forth, or to them and the steam, as described.

Also, the process of making a sheet of rubber or vulcanizable material, and vulcanizing it, the same consisting in spreading the rubber or material on a cylinder or roller by means as described, and vulcanizing the rubber while on cloth, or upon it and a steam jacket arranged with it as specified.

**80,810.—LOOM.**—George Crompton, Worcester, Mass.

I claim in combination with the harness, i, lever operated by hooked jacks, angular lifter, and depresser levers, the inclination, in which is effected by pins or projections from arms, l, working in or against inclines, n, substantially as described.

Also, the arrangement of the inclines, constructed substantially as described, for producing the inclination of the lever levers, substantially as described.

**80,811.—MEAT CHOPPER.**—Andrew J. Curtis, Monroe, Me.

I claim the arrangement of the impeding pawl, N, the arm, O, the ratchet, P, the spring, I, the knife lever, D, and the cam, d, E', as applied to the knife or knives and the tub, as set forth.

Also, the arrangement and combination of the depressing spring, I, its abutment, K, and adjusting screw, L, with the knife lever, D, and the series of cams, E', for operating it, as set forth.

Also, the arrangement of the shaft, d', b, b', and the holes, f, g, g', with the tub and the ratchet, P, arranged therewith, in manner and so as to be operated by an impeding pawl driven by the knife lever, as set forth.

**80,812.—DRILL STOCK.**—C. M. Daboll, New London, Conn.

I claim the arrangement of the several parts as herein described, the rest, B, pocket, K, and flanged plug, n, being combined in said arrangement.

**80,813.—ROTARY EXCAVATOR.**—James Deveraux, Marshall, Mich.

I claim an excavator composed of the standards, A, table, B, disk, T, drive wheels, K, and P, screw, Z, frame, K, batteries, O, plug, P, struts, L, hangers, M, bearing wheels, Q, chains, W, ropes, X, the vertical rotating shaft, D, the horizontal shaft, C, horizontal arms, G, adjustable guide wheels, H, g, g', bearing, P, g, g', U, cord, U, and capstan, Y, when arranged and operating substantially as described and for the purpose specified.

**80,814.—SAD-IRON SUPPORT FOR STOVES.**—Andrew Dickey, Albany, N. Y.

I claim a sad-iron support bracket B, constructed and adapted for being applied to a stove substantially as described.

**80,815.—MOTIVE POWER FOR SEWING MACHINES.**—A. H. Kuhnle, St. Louis, Mo.

I claim, 1st, The drums and springs when the same are operated by the lever and intermediate pinion wheel, substantially as described, as and for the purpose specified.

2d, The drums, L, L', with their springs, when the same communicate their power to the main driving shaft, or the machine, through a system of intermediate gears, and the whole is so combined and arranged as to operate substantially as described, as and for the purpose specified.

3d, Regulating the speed of the machine by means of the sleeve, E, lever, G, and fan blades, F, F', when the same are constructed and arranged so as to operate substantially as described.

**80,816.—COFFIN.**—Jefferson E. Everts, Madison, Conn.

I claim the application of the substance known as papier-mache, to be used in the construction and manufacture of coffins, substantially as and for the purpose above specified.

**80,817.—BRICK MACHINE.**—John A. Falconer and Robert Graham, Jersey City, N. J., assignors to Egbert C. Bradford, James H. Renick, and Obadiah A. Clough, New York City, assignors to J. H. Renick.

We claim, 1st, The adjustable pin, f, and adjusting holes, f', in combination with and placed in the toothed segment which gears into the rack rod that operates the plunger, substantially as and for the purposes described.

2d, A yielding spring connection, substantially as described, between the rack shaft which operates the plunger frame to drive out the molds and the crank which transmits the driving power of the machine to said rack shaft, said yielding spring connection having sufficient elasticity to maintain its position when the plunger frame and molds are in contact with the driving power of the machine, in order to prevent breakage of the machine, substantially as described.

3d, The hinged hook, L, made in the form substantially as described and shown, the spring, S, and the adjustable clamp, in combination with the connecting rod, M, and crank pin, K, of the crank, K, connected with the driving power of the machine, substantially as and for the purposes described.

**80,818.—MAKING BRAID.**—Joseph Fletcher, Providence, R. I.

I claim my improved mode, substantially as herein described, of making braid by a braiding machine, such involving the making of a single strand yarn, and the arrangement of the twists of a portion of them in directions opposite to those of the rest, the same being as and for the purpose specified.

**80,819.—MANUFACTURE OF SUGAR FROM SORGHUM JUICE.**—Addison L. Folger and A. Smith Folger, Sumner, and Henry Henshaw, Kansas City, Mo., assignors to A. L. Folger.

We claim, 1st, The arrangement of a consecutive series of filters, A, C, and a cone-shaped series of precipitating troughs and connecting pipes, and of a series of evaporating pans, two at least of which are connected through a hot filter, substantially as set forth.

2d, In combination with a series of evaporating pans, a water column, N, and series of pipes, for conducting the water into the pans, substantially as and for the purpose set forth.

3d, A transparent granulator, O, substantially as and for the purpose set forth.

**80,820.—HOSE COUPLING.**—Loren B. Forester, Clyde, Mich.

I claim the pipe, B, attached to and surrounding the pipe, A, the packing, C, the ears, D, the door levers, E, provided with shoulders, F, and catches, S, to form that part of my coupling attached to the pipe, A, when operating substantially as and for the purposes herein described.

Also, the coupling pipe, H, provided with shoulder, I, ring, J, pin, K, slot, L, spring, M, in connection with pipe, G, when constructed and operating to form the other part of my coupling.

Also, the combination and arrangement of all the above named parts to form the two parts of a coupling, when constructed and operating, substantially as and for the purposes herein set forth.

**80,821.—STEAM BOILER FURNACE.**—Jerome B. Gardner and Charles H. Swan, New York City, assignors to J. H. Renick.

We claim, 1st, The combination of the feed chambers for the furnaces of steam boilers, with the p-radiated pipes and conductors, E, which are protected by suitable coverings, as described and set forth.

2d, The arrangement of the grate bars, F, F', upon a concave frame, causing the fuel to fall to the center, in combination with the feed chambers and air-pipes, and conductors, as described and set forth.

**80,822.—ARTIFICIAL TEETH.**—Jethro J. Griffith, Philadelphia, Pa.

I claim the above described mode of effecting the attachment of pins to artificial teeth in the process of molding.

**80,823.—DUMPING CART.**—Rufus Ham and Joseph Durgin, Bangor, Me.

We claim the spindle-headed post, E, and the plate or circle, F, in combination with the rocker, R, and the trundles, I, I' and I'', constructed and operating substantially in the manner and for the purpose as shown and described.

**80,824.—SAW MILE.**—Martin Hillboldt, Syracuse, Ind. Antedated August 1, 1868.

I claim the side rails, g, g', of the saw carriage, E, constructed in the manner and for the purposes substantially as described and set forth.

**80,825.—BASKET.**—Horace C. Jones, Downington, Mich.

I claim, 1st, Constructing a basket of two thicknesses of staves or splints, the outer thickness, b, being composed of splints which extend from side to side of the basket, beneath its bottom, and the inner thickness or lining being composed of splints which extend from the center to the bottom of the basket to its top edge, substantially as described.

2d, The cap, h, and rivet, g, fastening the tapering points of the lining-splints, b, down to the splints, a, forming the outer thickness of the basket, substantially as described.

**80,826.—MACHINE FOR CLEANING COTTON.**—John Kershaw, Paterson, N. J.

I claim, 1st, The shaft, C, with its disk plates, H, and beater blades, I, in combination with the conically disposed grating, B, covering, E, openings, K, and F, and the roller, or discharge pipe, L, all constructed as and for the purpose herein set forth.

2d, The fan, P, screw, O, and apron, N, when combined together, and with the conically disposed grating, B, of angular section, the cover, E, the feed opening, K, air opening, F, outlet pipe, E, shaft, C, disks, H, and beater blades, I, or their equivalents, all arranged and operating substantially as and for the purposes herein shown and set forth.

**80,827.—WAGON SEAT.**—Israel Kinney, Detroit, Mich., assignor to Edward McGovern and John Webber, Hamilton, Canada.

I claim the ribs or lugs, E, when constructed and connected as herein set forth.

**80,828.—MACHINE FOR TRIMMING THE EDGES OF BOOTS AND SHOES.**—Richard C. Lambert, Raynham, assignor to David Whittemore, North Bridgewater, Mass.

I claim the combination of the jack or shoe-holding carriage, B, the pattern, the stop bolts, n, n, and the cutter carrier, N, provided with mechanism for operating them, substantially as specified, such carrier being provided with a saw, y, a paring knife, x, or the same and another roller or implement for smoothing or finishing the edge of a sole of a shoe.

**80,829.—MACHINE FOR BEAMING HIDES.**—Patrick Lennox, Lynn, Mass.

I claim, 1st, In a machine for beaming hides, or skinning or dressing leather, actuating the movements of the working tool by means of the connecting rod, g, and eccentric rod, h, the former being pivoted at one end to the sliding carriage, and the latter to the beaming tool carrier, and both being connected with the balance wheel by the means above described, the whole being arranged and operating as before described.

2d, The application of the elastic apron to the revolving tablet, in manner and for the purposes as hereinbefore explained.

3d, Applying the revolving tablet to the car-track frame, in such manner as to be enabled to adjust its vertical positions, substantially as herein shown and described.

4th, The means of accomplishing this vertical adjustment of the revolving tablet, the same consisting of the cross frame, o, and treadle, p, combined and arranged and operating as before explained.

5th, The inclination of the outer end of the horizontal beam or guide for elevating the beaming tool, substantially as before explained.

**80,830.—FOLDING MOSQUITO FRAME.**—Sebeus C. Maine, Boston, Mass.

I claim the folding frame, B, with cloth, C, and netting, D, attached, in combination with the rollers, A, and weight, E, the whole operating substantially in the manner and for the purpose specified.

**80,831.—GRIDIRON.**—C. H. Mock (assignor to himself and Israel Dixon) Quincy, Ill.

I claim the spider, A, cover, B, projection and staple, h, air-passage, C, and openings, c, c', for the purpose substantially as herein shown and described.

**80,832.—STOVE-PIPE DAMPER.**—Francis D. Pastorius, Philadelphia, Pa.

I claim, 1st, A valve seat and gas escape, in combination with an automatic self-acting valve, for the purpose specified.

2d, A valve seat and gas escape, in combination with the automatic self-acting valve, D, and the stove-pipe, flue, or other suitable receptacle, A, as shown.

3d, A valve seat and gas escape, B, in combination with the rod, C, valve, D, and the counterpoise, E, as shown.

**80,833.—COMB.**—Leonice Picot, Hoboken, N. J.

I claim a double comb, formed by coupling two combs together at their backs by a sliding coupling, so that they may be detached from each other at pleasure by sliding them apart and used as single combs, substantially as herein shown and described.

**80,834.—CLIPS FOR BOOTS AND SHOES, BELTS FOR LADIES' DRESSER, ETC.**—Elihu W. Francis, Marlboro, Mass.

I claim, 1st, The device of a spiral groove in a clip, in the manner and for the purpose specified.

2d, The attachment of a cover to the clip, substantially as described and for the purpose set forth.

**80,835.—PROCESS OF MANUFACTURING SULPHURIC ETHER.**—Ferdinand Rhenz (assignor to himself and John A. Bayly), Poughkeepsie, N. Y.

I claim the method or process of making sulphuric ether direct from the steam of boiling masses of corn, barley, or other grains, or molasses, or sugar, substantially as hereinbefore described.

**80,836.—MACHINE FOR BURNISHING AND SPINNING METALS.**—Frederick J. Raymond, Wolcottville, assignor to himself and E. Miller and Company, Meriden, Conn.

I claim, 1st, A revolving chuck or former, in combination with a tool fitted to yield and move automatically, in spinning or burnishing articles of sheet metal upon and over the former, substantially as set forth.

2d, The lever, w, in combination with the tool, i, stock, t', and spring for withdrawing said tool from the work, as set forth.

3d, The roll, i, and set screw, s, for converting said tool into a burnisher, as and for the purpose set forth.

4th, The arrangement of the tool holding slide, s, nut, r', screw, f, and slide rest, g, and screw, h, h', for the purposes and as set forth.

5th, The tool holding slide, s, to, i, t, spring, y, lever, w, set rest, g, second slide, i', bed, k, and hand wheel, p, arranged and applied substantially as specified, for spinning or burnishing articles of sheet metal upon a revolving chuck or former, as set forth.

**80,837.—HUB BORING MACHINE.**—A. R. Silver (assignor to himself and John Derrington, Salem, Ohio. Antedated July 25, 1868).

I claim, 1st, The combination of the radially grooved chuck plate, sliding gripper jaws, J, adjusting screw, H', pinions, H, and center spur wheel, G, substantially in the manner and for the purpose specified.

2d, The sections, h, h', of the feed nut, fitted in slotted bed, g', applied to a turning box or cap, D, constructed with a neck, z, substantially as described.

3d, The combination of the expandable nut, h, bed, z', neck, e, set screw, e', and stock, E, substantially as described.

4th, The construction of the gate plate, C, with an oblong opening, d, through it, one side of which is screw-cut to fit the mandrel, and the other side is provided with an adjustable screw-cut gib, C', and set screw, e', substantially in the manner and for the purposes described.

**80,838.—GANG PLOW.**—Andrew Smith and William P. Watson, Portland, Oregon, assignors to William P. Watson and J. Carter.

We claim, 1st, The combination of the rod, K, plate, J, through which the rod, K, screws, and which is attached to the hinge joint, L, hinge plate, I, plow beams, F, F', and standards and plows, G, H, substantially as described.

2d, The combination of the hinged beams, F, F', cord, c, rollers, M and N, ratchet, m, pawl, p, and foot lever, r, substantially as described.

3d, Attaching the rear end of the tongue to the axle, by means of a clevis, t, and a series of holes arranged as described, by which the draft can be changed, as set forth.

**80,839.—HORSE HAY-FORK.**—A. Smith, Schellsburg, Pa.

I claim, 1st, The combination, in a horse hay-fork of the shank, the pivoted teeth, the sliding bar, the sliding locking lever, and the loop, the combination being a self-operating substantially as set forth.

2d, The combination of the shank, the locking lever, and the sliding loop, with the slide bar, having a lateral projection on its foot working in the slot of the shank, as pivoted to the teeth by links, for the purposes specified.

3d, The combination, as set forth, of the rectangular slotted shank, the diagonally arranged spear head, the sliding teeth, the slide bar, the loop, and the locking lever, for the purposes specified.

4th, The combination, in a horse hay fork, of a shank, a self-acting lever pivoted on and vibrating parallel with the shank, and a loop sliding on the shank and embracing the shank and locking lever, and operating the latter by its ascent, as set forth.

5th, The combination substantially as set forth, with a horse hay fork, of pins and skewers, to be inserted crosswise into the load, to bind together and compress the hay.

**80,840.—SCREW-CUTTING MACHINE.**—Vincent Smith, Middlebury, Ohio.

I claim modifying the structure of the parts of said combination, and combining with said combination the several devices, in virtue of which the apparatus may be used as a drilling machine, as well as a bolt and nut-threading machine, substantially as described and shown.

**80,841.—POTATO DIGGER.**—W. Stark, White Pigeon, Mich.

I claim, 1st, The angular transverse frame, U, in combination with bars, T, hangers, V, connecting bar, Z, endless chain, P, and arms, V, when operating for the purpose set forth.

2d, Grated section, X, in combination with grated scoop, S, box, Y, escape-mat, W, ratchet, S, all operating as and for the purposes specified.

3d, The combination of the above named parts with elevator, R, sickle bar, K, pitman, J, crank shaft, F, reel, I, rollers, H, plate, L, provided with angular projecting arms, G, when constructed, arranged, and operating substantially as and for the purposes herein set forth.

**80,842.—GARDEN HAND PLOW.**—John Starr, Grand Rapids, Mich.

I claim a double hand plow, constructed substantially as and for any or all of the purposes specified.

**80,843.—LAMP BURNER.**—Edwin J. Toof, Madison, Iowa.

I claim, 1st, The spring, F, which are so constructed as not only to act as a support to the elevated cone, E, but at the same time to serve to clamp the chimney, whether the same be blazed to or have spring-clip connection with the foraminous air-screen, A, substantially as herein shown and described.

2d, The hinge joint, formed by the bend of the spring support, F, in connection with an aperture or depression in the disk, A, or any attachment thereto, substantially as shown and described.

3d, The spring catch, a, formed by the extension of the spring support, F, and arranged in relation to the cone, E, and locking into the central elevated portion of the air screen, or other convenient attachment to the burner, substantially as shown and described.

4th, The spring cl



23. The yoke-shaped lever, when pivoted at its end to stationary uprights, which in the middle portion is suspended from a spring, the weighing platform being suspended from the lever, between the supported and suspended part of the same, substantially as herein shown and described.

24. The combination of the elastic straps, b, b, with the curved plates, c, c, for the purpose of suspending the platform from the yoke-shaped lever, substantially as herein shown and described.

25. The arrangement and combination with each other, of the platform, D, straps, b, b, plates, c, c, lever, A, uprights, R, and spring balance, C, all made and operating substantially as herein shown and described.

80,858.—CAR TRUCK.—J. H. Denmore, Boston, Mass., assignor to himself and Hiram Fuller, Hallowell, Me.

I claim the construction and arrangement of safety sleeve, H, substantially as shown and described, in combination with the axle and wheels of car or tender trucks, when the said sleeve is made in two parts and affixed to safety beams, I, all as set forth.

80,859.—PLOW.—John G. Felzer, Brunswick, assignor to Felzer & Woodson, St. Louis, Mo.

I claim the land side, D, when constructed with the assembling bars, d and d', the whole being arranged as herein shown and described.

80,860.—DISTILLING SPIRITS FROM GRAIN.—William Hutson Ford, J. McKinnon, and L. C. Clarke, New Orleans, La.

We claim the process of neutralizing the acid and controlling the fermentation of grain, or other saccharine substance, which has been boiled or otherwise treated with acids for the purpose of effecting a more complete saccharification, whereby the usual loss of alcohol is obviated, by the means and in the manner substantially as set forth.

80,861.—SEWING MACHINE.—George H. Fox and Joseph Hubbard, Boston, Mass.

We claim, in combination with the adjustable fulcrum and guide plate, m, and the adjustable stripper plate, j, the screw and nut, arranged to hold both plates in position, substantially as shown and described.

Also, in combination with the two plates, m and j, and the screw and nut, the friction spring, q, arranged to operate substantially as shown and described.

80,862.—BRICK MACHINE.—Fred E. Frey, Bucyrus, Ohio, assignor to himself, D. J. Sheekier, and James M. Kelley.

I claim, 1st, The lever, j, compressible p. m. in, X, spring, L, nut, M, lever, O, the rack shaft, A, and pinions, q, q, racks, P, P, and press board, G, when constructed, combined, and arranged in the manner and to operate substantially as described.

2d, In combination with the rack shaft, A, pinions, q, q, and racks, P, P, the adjustable plate, y, friction rollers, e, e, and s. t. screws, f, f, when combined and arranged as described, and to operate in the manner and for the purposes set forth.

80,863.—SPINNING MACHINE.—James E. Hooper, Woodbury, Md., and Benjamin Arnold, East Greenwich, R. I.

We claim, 1st, The combination of the bar, a, or its mechanical equivalent, with the ring, rail, for the purpose of throwing off the empty bobbins, substantially as herein set forth.

2d, The combination, with a spinning machine, substantially as described, of the notched bar and sliding thread separator.

3d, The rail, k, and the mechanism for operating it, all constructed substantially as described, and for the purpose set forth.

80,864.—FRUIT PICKER.—N. G. Hughes (assignor to himself and Thomas Braden), Waynesboro, Pa.

I claim the lid or cover, D, spring, E, ring, B, hose, F, and cord, G, constructed and arranged as described, for the purpose specified.

80,865.—PRINTING PRESSES.—J. M. Jones, Palmyra, N. Y., assignor to himself, Henry Johnson, and George M. Bowman.

I claim, 1st, The arm or arms, N, or its or their equivalents, in combination with the plate, Q, or its equivalent, when arranged to engage with the said plate and to draw it against the form to which it has been previously raised substantially as and for the purpose described.

2d, The rocker arm or arms, Q, or its or their equivalents, arranged for operation upon the arm or arms, N, or its or their equivalents, substantially as described for the purpose specified.

3d, The lever or levers, M, or its or their equivalents, when arranged for operation upon the rocker arm or arms, Q, or its or their equivalents, to the impression arm, N, substantially as and for the purpose described.

4th, A movable hook or clasp for holding the sheet to the bed of the press, when operated by lever, a, and arranged for operation substantially as specified.

5th, The lever, G, or its equivalent, in combination with the frame carrying the ink rollers to the press, when arranged for operation therewith, substantially as and for the purpose described.

6th, A box or receptacle, in combination with the frame carrying the plate when arranged thereon for operation, substantially as and for the purpose set forth.

80,866.—KNITTING MACHINE.—Samuel Larkin (assignor to Bridgeport Knitting Co. ny), Bridgeport, Conn.

I claim the finger, a, constructed and operated as described, so as to carry the threads over any given number of needles to form the stitches in the relative position to each other, substantially as set forth.

80,867.—COOKING STOVE.—John Magee, Chelsea, Mass., assignor to Magee Furnace Company.

I claim a roasting closet, C, with a movable lid at its top, when said roasting closet is placed over or above a warming closet, F, and in front of the fire chamber of a cooking stove, substantially as and for the purpose set forth.

80,868.—HAND AX.—Edmond H. Meigs (assignors to Roys, Wilcox, & Co.), East Berlin, Conn.

I claim a hand ax, produced substantially as described, as an improved article of manufacture.

80,869.—SHIPS' DAVIT.—Christian Gotthold Meinhardt, Altoona, assignor to himself and Benjamin F. Bell, Antistown, Pa.

I claim the casing, B, in one end of which swings the davit, A, provided with a castor, g, swinging around the bar, G, which is secured by the three pointed foot, g, and hook, H, and operated by the sleeve, I, substantially as and for the purpose set forth.

80,870.—HORSE HITCH.—William A. Middleton and John A. Haller, Harrisburg, Pa.

We claim, 1st, So forming the slot, K, in the top of the frame, O, O', as to serve the several purposes, substantially in the manner as herein set forth.

2d, The adjustable floor, Z, Z', provided with the trunnion rests, n, n', and the serrated part, l, l', etc., in combination with the frame, W, W', substantially as herein set forth.

3d, The holder, S, when made with the equidistant wings, a, a', and the thumb piece, E, in combination with the frame, O, O', W, W', and floor, Z, Z', for the purpose specified.

80,871.—SAW-SET AND GAGE.—W. B. Noyes and C. S. Baker, Manchester, N. H.

We claim the within described device for gaging and setting the teeth of saws, substantially as described.

80,872.—DOUBLE-TREE.—Horace Palmer and Asa N. Case, Kingsville, Ohio.

We claim the brace rod, D, whose ends enter recesses in the rear edge of the wooden bar, A, and are connected therein by the clevises, B, when said rod is adjusted nearer to or farther from the bar by the eye bolt, E, embracing its center, as herein shown and described.

80,873.—STUMP MACHINE.—Isaac Pardee (assignor to himself and Orson Reed), Buena Vista, N. J.

I claim, 1st, The machine, consisting of the frame, A, having the shaft, B, with the wheels, C, mounted thereon, with the levers, E, F, stirrups, J, and pawls, c, constructed and arranged to operate substantially as described.

2d, In combination with the lever, E, and stirrups, J, the levers, c, arranged as described, for raising the stirrups from the wheels, C.

3d, The pivot handles, H, provided with the stop rod, I, and arranged to operate as set forth.

4th, The hinged bars, h, for supporting the levers E, when arranged as shown and described.

80,874.—WATER-WHEEL.—O. M. Pike (assignor to himself and S. O. Green), North Leverett, Mass.

I claim the rotary slotter, drum, or cylinder, J, in combination with the wheel, B, and case, C, all constructed and arranged to operate in the manner substantially as and for the purpose set forth.

80,875.—WELL TUBE.—E. W. A. Platt, Bristol, and George Platt, East Hartford, assignors to themselves and Linus Wilcox, Middletown, Conn.

We claim a well tube, having lateral perforations and pebbles placed in the lower section, when so arranged that the pebbles shall be moved in their position by the action of the pump, all substantially as and for the purpose described.

80,876.—MECHANISM FOR OPERATING HARNESSES IN LOOMS.—Osgood Plummer and James Schofield, Worcester, Mass.

We claim, 1st, The combination, with the double slotted cam piece, F, of the slotted arm, f, and connection, H, substantially as and for the purposes set forth.

2d, The combination, with the arms, D, D, of the plates, E, E', or their equivalents, substantially as and for the purposes set forth.

3d, The combination, with the arms, D, and plates, E, E', for lifting and depressing the bars, L, of the pieces, C, and B, with which the front ends of said arms are connected, substantially as and for the purposes set forth.

4th, The combination, with the bar, L, or its equivalents, of the lifting and depressing plates, E, E', and arms, D, substantially as and for the purposes set forth.

5th, The combination, with the bars, L, of the roll, N, or its equivalent, substantially as and for the purposes set forth.

6th, The combination, with the mechanism which works against the pattern wheel or chain of a fancy loom, of mechanism for freeing the pattern wheel or chain from contact with said mechanism, for the purposes set forth.

7th, The jacks, J, provided with the slots, 12 and 13, substantially as and for the purposes set forth.

8th, The combination, in a fancy loom, having elevating and depressing arms, working on fixed fulcrums forward of the cloth-making point, of a series of jacks, constructed substantially as described, combined with a series of harnesses by means of cords, or their mechanical equivalent, throwing or motion a roll or rolls, L', so as to give to the harnesses a greater throw or motion than is imparted to the lifting and depressing arms, for the purposes set forth.

9th, The combination, with a jack, J, and bar constructed as described, of a spring, 15, substantially as and for the purposes set forth.

10th, The combination, with a jack, J, of a bar, L, having two front projections, I, and a rear projection, K, substantially as and for the purposes set forth.

80,877.—HYDRAULIC PRESS.—George W. Rawson, Cambridgeport, Mass., assignor to himself and Michael Hittler.

I claim the combination of the platform, G, hydraulic press, C, D, rods, a, and plate, H, arranged to operate substantially as described, for the purpose set forth.

80,878.—SWITCH AND SIGNAL.—John Saxby and John Stinson Farmer, Kilburn, England.

We claim a series of levers, and the within described slides or their equivalents, combined with the switch and signals of a railway junction, substantially as set forth, the whole being arranged and so operating that, after a change in the position of a 10th the levers, connected to signals properly displayed to indicate the condition of the road, are locked in their positions, while the remaining levers may be adjusted so as to change the position of

the signals or switches, which are improperly arranged, all substantially as specified.

80,879.—HARVESTING RAKE.—Frank Schurger and Nicholas Allstetter, Hamilton, Ohio.

We claim, 1st, The combination of the catch, L, sliding bearing, I, and frame or quadrant, K, with each other and with the stop, U, rake shaft, H, and shaft C, substantially as herein shown and described, for the purpose of preventing any motion of the said shaft, H, but one revolution on its axis while the rake head is sweeping over the platform.

2d, The combination of the curved racks, P and R, with each other and with the frame, K, and rake shaft, H, substantially as herein shown and described, for the purpose of partially rotating the shaft, H, and causing the rake head to sweep over the platform.

3d, The combination of the fingers, N and M, with each other and with the shaft, H, and catch, L, substantially as herein shown and described, for the purpose of releasing the catch, L, from the stop, U, at the proper time.

4th, The combination of the clutch, Y, lever, A', and arm, B', with each other and with the shaft, C, collar or sleeve, W, and frame or quadrant, K, substantially as herein shown and described, and for the purpose set forth.

80,880.—MACHINE FOR CUTTING OPEN DITCHES.—Jasper N. Smith and William O. Buckley, Washington, Ill.

We claim, 1st, The hanging the ditcher in a frame, as shown in the drawings, thus avoiding the use of a man, and avoiding all clogging under the beam in machines which make use of a man.

2d, The movable slides, A, A, in connection with the movable knives, B, B, so constructed as to carry on a greater or less width of earth as the machine is cutting.

3d, The form of the rear of the nose, that is, the rear carried up, as shown, to avoid friction, and expanded, as shown, to support the slides.

80,881.—COOKING UTENSIL.—Julius Smith and Isaac E. Hall, Logan, Ohio.

We claim the cooking lid of a steamer by means of spiral springs, whereby all danger from excessive pressure of steam is avoided, substantially as herein set forth.

Also, the cooking apparatus, composed of the reservoir, A, cover, B, lining, C, shell, D, stand, E, vessels, F, and the springs, G, when constructed in the manner and for the purpose specified.

80,882.—CHURN.—Joseph Stadler, Detroit, and George M. Strong, Plymouth, Mich.

We claim, 1st, The vessel, A, in combination with the rotating dasher-shaft F, and revolving casher-wings or boards, F', and the shifing wings, a, substantially as shown and described, and for the purposes set forth.

2d, The shifing wings, c, in combination with the vessel, A, substantially as shown and described, and for the purposes set forth.

80,883.—RADIATOR.—William Steffe (assignor to himself and Jesse Reynolds), Philadelphia, Pa.

I claim the radiator wrought into drum or radiator, constructed substantially as herein specified.

80,884.—SECURING MASTS OF VESSELS.—D. S. Stevens and Lambert Snedcor, Red Bank, N. J.

We claim supporting the masts of vessels in flexible and elastic partners and steps, substantially as and for the purpose described.

80,885.—STOP MOTION FOR LOOMS.—John J. Switzer, Roxbury, assignor to himself and Edwin H. Fitz, Northborough, Mass.

I claim, 1st, The wings, K, K, constructed substantially as described, and provided with the warp supporting cords or rods, in combination with the rising and falling board, as and for the purpose set forth.

2d, The wings, K, K, in combination with the vertically movable frame, F, and the wings, K, as and for the purpose set forth.

3d, The vertically movable frame, F, carrying the flat board, H, and the shaft, G, substantially as herein shown and described.

4th, The lug, r, projecting from the flat board, H, in combination with the lines, p, projecting from the rack shaft, G, all made and operating substantially as and for the purpose herein shown and described.

5th, The slide, J, connected with the shifing lever, I, spring, e', and elbow crank, N, substantially as herein shown and described.

6th, The devices herein shown and described, for transferring motion from the rack shaft, G, to the elbow crank, N, and the shifing lever, I, all made and operating substantially as herein shown and described.

7th, A tread detector consisting of the wings, K, K, threads, m, frame, F, shifing, G, flat board, H, lug, r, cam, d', lever, M, spring, l, pin, v, hook, z, frame, o, cord, y, elbow, N, slide, J, and shifing lever, I, all made and operating substantially as herein shown and described.

8th, The shifing arm, M, cord, l, pin, v, and block, m, in combination with the hook, z, having the inner projection, a', and hinged in the frame, o, and combined with the slide, S, all made as set forth.

80,886.—HEAD FOR BARRELS.—Merritt L. Thompson (assignor to himself and John P. Rittenhouse), Flemington, N. J.

I claim, 1st, A movable head for barrels or casks, formed in sections, with the last section that is introduced, and held down by a turning button, or equivalent clamp, substantially as set forth.

2d, A turning button applied to the inner side of a sectional head, and fitted substantially as specified, so as to be turned from the outside of said head and secure the sections in place, substantially as set forth.

80,887.—KNITTING MACHINE.—James Walde (assignor to himself and Geo. Kennedy), Ipswich, Mass.

I claim a racket wheel, G, with a single or eccentric, H, operated by a slide, F, for carrying an even number of courses of three or four courses, substantially as set forth.

Also, a racket wheel or disk, P, provided with three or more flanges, constructed as described, in combination with a corresponding number of levers, R, B, and operated by two drivers, B, for weaving, or for even courses of three or more colors, substantially as and for the purpose specified.

80,888.—SPIRIT METER.—Joel D. Weaver (assignor to himself, C. A. Snowdon, and L. S. Bunnell), Troy, N. Y.

I claim, 1st, The improved valve actuating mechanism, substantially as herein shown and described, for the purpose set forth.

2d, The improved valve, K, in combination with the valve chest, I, provided with ports, arranged substantially as and for the purpose set forth.

3d, The combination of the sliding rod, E, valve stem, m, e, and spring actuated arm, F, for operating the valve, K, substantially as and for the purpose set forth.

4th, The combination with the arm, f, of the tube, G, provided with the springs, K, and K', and actuated by the slide, E, substantially as and for the purpose set forth.

80,889.—SEWING MACHINE.—Wm. C. Willmarth (assignor to B. W. Lacy & Co.), Philadelphia, Pa.

I claim the revolving disk, E, arm, L, carrying a detachable needle, n, and the adjustable stop, q, in combination with the vibrating lever, o, and the adjustable stop, q, and the adjustable stop, t, the whole being constructed and operating as and for the purpose described.

80,890.—BAIRN MACHINE.—Philip N. Wolston, Springfield, Ohio, assignor to himself and Ferrell, Ludlow & Rodgers.

I claim, 1st, The die, A, in combination with rods, D, arranged in relation thereto substantially as and for the purpose set forth.

2d, Forming the mouth of the die with the projection, e, in the middle of the sides of A', substantially as and for the purpose set forth.

80,891.—GLOBE.—Graham D. Abbot, New York city.

I claim a globe constructed of flexible material, and distended by means of an elastic rubber bag, or with cork, hair, sponge, or other light elastic substance, substantially as described.

80,892.—CORN PLANTER.—Henry Ackerman, Pittsburg, Pa.

I claim, 1st, Supporting the rear of the planter by a single wheel, B, mounted on a rigid frame, in combination with the side wheels, O, mounted on hinged frames, substantially as and for the purpose described.

2d, The cultivators, m', secured at their upper ends to the angular levers, m, substantially as and for the purpose described.

3d, The removable T-shaped marker, substantially as and for the purpose described.

80,893.—SECRETARY.—Ezra Ale, Clearfield, Pa.

I claim the combination with a secretary or bookcase, of the movable shelves or cases, H, belts, G, and pulleys, E, and F, substantially as and for the purpose described.

80,894.—CLAMP.—Andrew Anderson, Madison, Wis.

I claim the combination of the cams, C, C, the jaws, A, A, the lever, E, the yoke, H, H, and the plunger, F, all constructed, arranged, and operating as and for the purpose set forth.

80,895.—MACHINE FOR PRINTING YARN.—Carl F. Austel, New York city.

I claim the movable carriage, B, carrying two rollers, a, and a rack, c, in combination with printing rollers, e, f, suspended in the standard, g, substantially as and for the purpose herein shown and described.

80,896.—TORPEDOES FOR OIL WELLS.—Alexander T. Ballantyne, Titusville, Pa.

I claim, 1st, The hollow and loaded exploding plunger, E, acting by the pressure of the water on its end, to ignite the charge, substantially as specified.

2d, The combination of the hollow and loaded exploding plunger, E, with the close cylinder or pocket, D, arranged to project down within the body or magazine, A, said plunger and pocket being so constructed as that the latter forms an anvil, and the charge in the plunger, and through the bursting of the latter and its pocket, also the charge in the body or magazine, A, essentially as herein set forth.

3d, The combination of the free or independent exploding plunger, E, with the body, A, and its ball, G, in such manner as that the torp. do is or may be made to form a foot made in the lowering wire or rope, directly by said plunger, and indirectly by or through its ball, substantially as shown and described.

80,897.—SAFETY BRIDLE.—G. W. Barnes, Mount Vernon, N. Y.

I claim the supplementary straps, E, detachable and adjustable, as applied and combined with the single check strap, A, of the safety bridle, substantially as and for the purpose herein described.

80,898.—TABLE, DESK, ETC.—Elias Becker, Pittsburg, Pa.

I claim the combination with tables, desks, or other similar articles, of the sliding frame, B, provided with the tablet, C, and spring, E, substantially as and for the purpose described.

80,899.—BELT KNIFE.—Henry Blake (assignor to himself, Geo. W. Blake, Ous Blake, and James Blake), East Pepperell, Mass.

I claim the improved belt punching knife herein described, as a new article of manufacture.

80,900.—MACHINE FOR PUNCHING AX POLLS.—Robert Blake, Seranton, Pa.

I claim, 1st, In a machine for punching ax polls and other tools, the combination with the punch block, b, and square, g, dies of a 15-end former or die, constructed as herein specified, and applied to the end of the dies in which the bit end of the poll is received or shaped in the manner described, that is to say, so that when the squaring dies are brought together, the said "former" shall completely close the said end of the dies, substantially as herein shown and set forth.

2d, The combination with the shears of the edging dies or formers operating in connection therewith, in the manner described, so that the poll shall

simultaneously be "edged" and severed from the stock, substantially as herein shown and set forth.

3d, The combination of the shears and edging dies with the cross head which carries the squaring dies, under the arrangement and for operation as herein shown and specified.

4th, The combination in a machine such as described, of the squaring dies, "bit end" formers, shears, and edging dies, when the same are operated simultaneously from a single cross head, substantially in the manner and for the purposes shown and set forth.

80,901.—ELBOW SUPPORT FOR FLEXIBLE HOSE.—Augustus O. Bourne, Cranston, R. I.

I claim the improved hose rings, A, A, constructed and held in connection substantially as described, for the purposes specified.

80,902.—FERRY BRIDGE.—John S. Bradford, New York city.

I claim a platform or grating attached to a ferry bridge, whether submerged, or at or above the surface of the water, constructed substantially as herein described and for the purpose set forth.

80,903.—SEWING MACHINE.—James Briggs, Lyons, Ohio.

I claim, 1st, The shaft, B, with gear wheel, b, slave clutch, b', loose gear wheels, b'', the spring, E, lever, F, shaft, G, with gear wheel, g, and pinion, g', the shaft, H, with gear wheels, h, and roller, h', the whole being combined and operated in the manner and for the purpose described.

2d, The standard, C, G, shaft, D, wheel, d, pitman, I, ways, J, and stays, J', in combination with standard, K, shaft, k, and strap, K', when operated in the manner and for the purpose herein set forth.

80,904.—METALLIC HEEL PATTERN.—Jacob Brobst, Fort Wayne, Ind.

I claim the segments, A, A', hinged and operated in the manner and for the purposes described and set forth.

2d, The combination of the hinged segments and curved slotted arm and stud, and set screw, the same being constructed in the manner and for the purpose set forth.

3d, Forming the segments, a, a', on the edge of sections, A, A', for the purpose of admitting the point of a sharp instrument, as described, and for the purposes set forth.

80,905.—PUMP.—John Brockenshire, Oswego, N. Y.

I claim, 1st, The internal chamber, E, E, in conjunction with suction pipe, D, as arranged relatively with the barrels, A, A, plungers, B, B, valves, C, C and discharge outlet, P, substantially as herein described and for the purpose set forth.

2d, In combination with the parts above, the opening in the partition, G, said opening being in line with the section pipe, D, as and for the purpose described.

80,906.—APPARATUS FOR CURING TOBACCO.—Nathaniel W. Broome, Baltimore, Md.

I claim the arrangement of escape pipes and deflectors on the shell or jacket of the heater, so that the rising up of the heated air shall be passed outward and through the escaping products of combustion, and the form and the latter in being uniformly disseminated throughout the curing apartment, substantially as described.

80,907.—SEWING MACHINE.—A. R. Byrkit and C. S. Byrkit, Fairfield, Iowa.

We claim, 1st, The combination with the shuttle face plate arranged obliquely to the feed movement, of the obliquely moving vibrating carrier and double pointed shuttle, substantially as and for the purpose set forth.

2d, The combination of the heart-shaped cam, N, with the feeding mechanism described, for operating the feed, in whichever direction the machine is run, substantially as herein set forth.

80,908.—NEEDLE-SHAPENING ATTACHMENT FOR SEWING MACHINES.—James Callan, Bridport, Conn.

I claim, in combination with a bobbin winder of a sewing machine, a grinding wheel, H, arranged upon the revolving mandrel, substantially in the manner and for the purpose set forth.

80,909.—LAMP BURNER.—Wm. Carleton, Boston, Mass.

I claim, 1st, Forming the elevated deflector and the supporting standards upon its periphery in one continuous piece of metal, substantially as and for the purpose set forth.

2d, Forming the elevated deflector, its supporting standards, and the chimney-holding springs in one continuous piece, substantially as herein shown and set forth.

3d, The arrangement of the standards and chimney-supporting springs in alternate order upon the periphery of the deflector, in the manner shown and described.

4th, The combination with the air distributor and the elevated deflector with its chimney-holding springs and standards, of a bent-over ring for holding the deflector to the air distributor, whether the said ring be formed in one piece with said standards, or separately therefrom, as and for the purposes set forth.

5th, The combination of the elevated deflector and its downwardly extending peripheral springs with the chimney and chimney seat and shoulder formed on said seat, or the air distributor to prevent the excessive yielding of said springs, as herein shown and set forth.

6th, The combination with the base and wick tube of a sleeve for supporting the deflector and air distributor, held upon the base and wick tube, in the manner described, and provided near its lower end with perforations or openings for the supply of air directly to the flame, as set forth.

80,910.—FORM BLOCK FOR BASKETS.—W. H. Carpenter, New York city.

I claim the combination of the expanding or movable sections, E, the supporting ring, D, and the conical wedge, B, substantially as and for the purpose herein specified.

80,911.—OIL CUP FOR STEAM ENGINES.—John C. Carroll, Littlefield, Ill.

I claim, 1st, The oil cup, A, when provided with double valves, B, B', and an internal measuring chamber, b', substantially as herein shown and described.

2d, The combination and arrangement of the screw cap, A, lever, A', and valve rods, B, B', substantially as described and set forth.

80,912.—QUARTZ CRUSHER.—Edmund Castle, Lincolnton, North Carolina.

I claim, 1st, The end housing plates, C, C, of a quartz crushing mill, provided with the grooves for holding the side plates, and the inclined plates, D, E, and the bottom of the hopper, substantially as and for the purpose described.

2d, The combination, with a quartz mill, of the swinging gate, I, provided with a metal plate, the inclined plate, D, and the adjustable plate, f, substantially as and for the purpose described.

80,913.—CARPET LINING.—G. W. Chipman, Boston, Mass.

I claim a carpet lining, the wadding and paper sheets of which are connected together by the lines or spots of cement, substantially as set forth.

80,914.—SHEEP SHEARS.—P. G. Clancy, Augusta, Me.

I claim the employment of the center blade, C, constructed with parallel cutting edges, substantially as and for the purpose set forth.

80,915.—AUGER.—Leander Colt, Niagara Falls, N. Y.

I claim the reversible attachment, B, B, constructed as described, that is, having a bit at one end, and hollow auger at the other, when operated in connection with the gage, c', and auger, A, substantially as and for the purpose set forth.

80,916.—COOKING STOVE.—Thos. Colwell, Troy, N. Y.

I claim, 1st, The employment of the racks, C, constructed and arranged with zigzag bars, a, substantially as shown at fig. 5 of accompanying drawings, in combination with the stationary grate, B, and with the ash pan or drawer, A, the whole being arranged in the manner substantially as herein contained, described, and set forth.

2d, The rake, C, so arranged and constructed with zigzag bars, a, substantially as shown at fig. 6 of the accompanying drawings, and in the manner and for the purposes substantially as herein contained, described, and set forth.

3d, The employment of the handle or lever, J, in combination with the rake C, and with the hearth of the stove, so that the rake, C, may be vibrated in a horizontal plane when used in connection with the grate, B, and ash pan or drawer, A, in the manner substantially as herein described and set forth.

80,917.—COOPERS' CROZE.—C. O. Cook, Rockford, Ill.

I claim the arm, b, shoulder, b', and spring, b', of cutting iron, c, when combined and operated in connection with the head of screw, C, as and for the purpose set forth.

80,918.—CARBURETER.—M. P. Coons, Brooklyn, N. Y.

I claim, 1st, Saturating the pumice stone and the series of corrugated porous bricks, D, contained in the case, A, with hydrocarbon liquid, and drawing off the surplus liquid by means of the siphon pipe, I, communicating with the distributor, G, as herein described for the purpose specified.

2d, The pumice stone and porous bricks, D, and above the coiled steam pipe, B, as herein described for the purpose specified.

3d, The construction and arrangement of the closed case, filled with pumice stone, and the series of corrugated porous bricks, D, the distributor, G, coiled steam pipe, B, siphon pipe, I, the air pipe, F, extending through the centers of the porous bricks, D, the discharge pipe, K, the air vessel, A, all operating as described, whereby no accumulation of gas is effected, as herein set forth.

80,919.—ROCKING AND RECLINING CHAIR.—David Cox, Cincinnati, Ohio.

I claim, 1st, The combination, substantially as described, of the chair, A, rockers, B, B', restles, G, G', e. e', stops, f, f', seat, g, g', foot rest, i, i', and slotted arms, J, J', K, K', or their mechanical equivalents, or the purpose set forth.

2d, In combination with the elements, A, B, B', C, C', e. e', f, f', g, g', i, i', and J, J', K, K', the studs, L, and fixed hooks, M, for the object stated.

80,920.—DAMPER.—David B. Cox, Troy, N. Y.

I claim the reversible ventilator, check damper, consisting of a damper, F, attached to an extension, e, of the stovepipe, C, projecting in a direction opposite to or different from the said pipe, and reversible with it, substantially as and for the purpose herein specified.

80,921.—CHURN DASHER.—H. A. Crance, Lewisburg, Pa.

I claim the attaching of the cones, C, C, C, to the arms of a churn dasher, in the manner and substantially as described.

80,922.—ELECTRO MAGNETIC ALARM.—Moses G. Crane, Newton, Mass.

I claim, in combination with the electro-magnet and its armature the battery, and the circuit, constructed with the armature mechanism, and arranged to be operated substantially as shown and described.

Also, in combination with the striking mechanism, the stops, x, y, and finger, a', an equivalent locking and disengaging mechanism, substantially as described.

80,923.—LUBRICATOR.—Henry Crossley, Brooklyn, N. Y.

I claim the oil cup, having its upper valve, c, combined with the cover, and applied to the cup, all substantially as herein shown and described and for the purposes set forth.

80,924.—BELT BUCKLE.—William Cummings, Sacramento, California.

I claim, 1st, The points, provided with shoulders or rings near the end.

2d, The lever, so arranged as to press said points through the belt and against the plate, substantially as set forth and described.

80,925.—CARPET STRETCHER.—S. G. Dare, New York city.



- I claim a carpet stretcher, having its teeth, a and b, and movable handle, c, arranged substantially as described, whereby it is caused to act upon the under side of the carpet, substantially as herein described.
- 80,926.—VAPOR BURNER.**—Dr. W. E. Darrah, Baltimore, Md.  
I claim the burner, composed essentially of the parts, A, A', and a', having the jets, c, c', when constructed substantially as and for the purpose specified.
- 80,927.—CASING FOR RAILWAY-CAR STOVE.**—S. L. Denney, Christiansburg, Pa. Antedated July 30, 1868.  
I claim, 1st, The casing, A, provided with ribs, 11, in combination with a railroad-car stove, substantially as for the purpose set forth.  
2d, The combination of base, B, with casing, A, as and for the purpose described.
- 80,928.—LATHE CHUCK.**—J. S. Detrick, San Francisco, Cal.  
I claim the back plate, D, constructed as described, in combination with the sliding chuck and adjusting screw, C, all substantially as set forth.
- 80,929.—SAW.**—Charles Disston (assignor to Henry Disston), Philadelphia, Pa.  
I claim a detachable saw tooth having a circular elastic base adapted to a circular recess in the blade, when there is on the edge of the said base a recess, and from the circular line which defines the same, such a projection or protuberance that the elastic base will yield on fitting the tooth to its base, all as herein set forth for the purpose specified.
- 80,930.—POWER CRANE.**—W. F. Durfee, New Bedford, Mass.  
I claim, 1st, The screw, B, with the nut, c', and pulleys, D, D', attached, in connection with the chains, E, E', and carriage, H, all arranged and applied to the crane, to operate in the manner substantially as and for the purposes set forth.  
2d, The lever, F, in combination with the chains, E, E', for the purpose of compensating for any inequality of tension between the two chains, as herein set forth and shown.
- 80,931.—DOOR SPRING.**—Wright Duryea, Glen Cove, N. Y.  
I claim, 1st, The combination, with the hinge proper, of the drum, H, chain or band, L, spindle, G, spring, J, worm wheel, I, and screw, K, for operation together, essentially as herein set forth.  
2d, The arrangement, substantially as described, of the screw, K, relatively to the working mechanism of the hinge, and whereby the tension of the spring may be adjusted from the exterior of the jamb, as specified.
- 80,932.—SWITCHING APPARATUS FOR STREET RAILWAY CAR.**—P. S. Desnoches, New Orleans, La.  
I claim the rocker arm, A, when provided with the radiating guide arm, B, and the weighted arm, C, in combination with the lever, C, and chains, a, e, f, the whole being constructed, arranged, and operating conjointly, substantially as herein described for the purpose set forth.
- 80,933.—TWEED IRON.**—C. F. Espick, Plymouth, assignor to himself and Joseph and John Stough, Marshall county, Ind.  
I claim the arrangement of the screw, D, plate, C, and hinged bottom, E, with the two boxes, constructed and operating as set forth.
- 80,934.—SHOE FOR BATHING AND OTHER PURPOSES.**—Louis Desiré Jeandron-Ferry, Paris, France.  
I claim, 1st, A shoe, constructed with a perforated sole, through which, on the bathers emerging from the water, access is provided for the water from the interior of the shoe, substantially as herein described.  
2d, The metallic gauze, in combination with the perforated sole, substantially as and for the purpose herein specified.
- 80,935.—COAL STOVE.**—G. F. Filley, St. Louis, Mo.  
I claim forming the fire pot of a coal stove of two cones, B and D, having an opening or air stack, a, between their bases, for the admission of atmospheric air, when the cones are arranged, constructed, and operated substantially as herein set forth.
- 80,936.—FIRE AND BURGLAR-PROOF SAFE.**—Daniel Fitzgerald, New York City.  
I claim, 1st, In the construction of safes for security, the employment of the corrugated case or cylinder.  
2d, In combination therewith, the outer cylinder or case, as described.  
3d, The inner cylinder or case in longitudinal sections, in combination with a case or cylinder to surround the same and hold it in place.  
4th, The inner cylinder or case in transverse sections, in combination with a suitable surrounding cylinder or case to hold said sections in place.  
5th, The inserted metallic head, substantially as described.  
6th, In combination with a corrugated case or cylinder, and the outer casing thereto, or the inner case, the filling in of the space formed under the action of said corrugations and other interstices, with a fire-proofing material, substantially as set forth.
- 80,937.—MACHINE FOR TINNERS' USE.**—W. Forshee and J. L. Judd, Marathon, N. Y.  
We claim, 1st, Forming the knives or cutting parts, P, of the die, N, in four or more pieces, separate from and adjustably secured to the body, N, of the die, substantially as herein shown and described and for the purpose set forth.  
2d, Making the grooves, O, which receive the dies, N, adjustable, substantially as herein shown and described and for the purpose set forth.  
3d, The combination and arrangement of the bed plate, A, standard, B, braces, C, curved horizontal guide, D, dies, L, M and N, P, rod, E, hooked lever, G, spring, K, connecting rod, I, and treadle or foot lever, J, with each other, substantially as herein shown and described and for the purpose set forth.
- 80,938.—APPLE CORER AND CUTTER.**—A. Frost, Seymour, Indiana.  
I claim, 1st, The slide, C, provided with rod, d, head, G, and knives, e, e, in combination with tube, b, in the center of the circular hole on the board, D, all constructed substantially as described, for the purpose of cutting the core out of apples, as herein set forth.  
2d, The combination and arrangement of the grooved bed piece, A, board, D, lever, H, slides, B and C, knives, a, a', and annular disk, F, all constructed as described and operating substantially as and for the purposes herein set forth.
- 80,939.—FLASK OR BOTTLE.**—W. T. Fry, New York City.  
I claim a covering for flask or bottle, or other glass vessels, composed of paper-mache, or an analogous substance, or a textile or felted fabric, fitted on the flask or bottle, and coated with Japan or other water-proof varnish, substantially as shown and described.
- 80,940.—MANUFACTURE OF CARBONATE AND OTHER SALTS OF SODA.**—J. M. Gattman, New York City.  
I claim the manufacture of carbonate of soda and the carbonate of soda, by the process substantially as described.
- 80,941.—HOSE TENDER.**—H. A. Gilbertson, New York City.  
I claim a hose tender or carriage having coverings or protectors, b, b', seats, c, c', and brace, d, in substantially the manner described and shown and for the purposes set forth.
- 80,942.—DOVETAILING MACHINE.**—R. E. J. Gould, New-York, N. Y.  
I claim, 1st, The within-described method of cutting dovetails by working from the bottoms of the grooves, or of the spaces between the tenons, consisting of the adjustable stops, e, in the slides of the upright gages, F, J, or any equivalent means which will produce the same result.  
2d, The adjustable stops, e, extending down into the grooves or spaces between the tenons, and secured in the slides, c, which are movable up and down on the upright gages, F, J, substantially as and for the purpose set forth.  
3d, The slotted bracket, h, in combination with the fulcrum pin, g, of the swinging abutment, i', substantially as and for the purpose described.  
4th, The combination of an abutment, i, or i', with an upright gage, F, or J, movable in one direction, and provided with a slide, c, which is movable in the direction at right angles to the motion of the gage, substantially as and for the purpose set forth.  
5th, The double-acting vertically-movable slides, c, in the upright gages, F, J, substantially as and for the purpose described.  
6th, The arrangement of two abutments, i, i', extending across the carriage H, in different directions, and at angles which are supplements to each other, said abutments being provided with upright horizontally-adjustable gages, J, J', and vertically-adjustable slides, c, substantially as and for the purpose set forth.
- 80,943.—MODE OF CANCELING POSTAGE AND REVENUE STAMPS.**—Henry Greenfield, New York City.  
I claim a postage or revenue stamp, prepared with acetate of lead, or other chemical, so that it can be canceled by the action of sulphate of ammonia, or other chemical, as a new article of manufacture.  
Also, the within-described process of canceling postage or revenue stamps simultaneously in quantities by exposing them to the action of fumes of sulphur, or of other chemicals in a gaseous form, substantially as set forth.
- 80,944.—BED BOTTOM.**—Benj. Gregg, Bennington, Vt.  
I claim the bed bottom formed of plate spring, c, attached to the frame, b, by the clamping pieces, d, and formed with the crutches or saddles, e, at their meeting ends, receiving the side, g, g', as and for the purposes specified.
- 80,945.—LIQUID COOLER.**—Emil Haas and M. A. F. Haas, Meadville, Pa.  
We claim the trough, B, and pipe, B', constructed and arranged as described, in combination with fans, E, E', arranged as described, the whole being operated in the manner and for the purpose set forth.
- 80,946.—NUT MACHINE.**—J. S. Hall, Pittsburgh, Pa.  
I claim, 1st, The arrangement of the holing punch, F, cutting-out swaging punch, D, ram, C, and half toggles, H, H', with the weighted levers, V, V', all constructed and operated substantially in the manner described.  
2d, The arrangement of the perforated follower, I, matrix box, H, and holder, J, with slotted lever, M, and weighted crank lever, P, Q, the whole constructed and operated as herein shown and described.  
3d, The improved machine, as described and shown, for making nuts from hot bars of iron, in the manner specified.
- 80,947.—MACHINE FOR HANDLING HIDES.**—John Hammond, Littleburg, Ohio.  
I claim the frame, A, provided with the rollers, a, a, in combination with the cleats, B, B, on the sides of a vat, for the purpose of easier handling the hides, substantially as herein set forth and described.
- 80,948.—LOOSE PULLEY.**—D. Harrington, Worcester, assignor to himself and E. A. Woods, Boston, Mass.  
I claim in combination with the bearing, B, and oil passages leading through it, and the surrounding oil chamber, c, the enlargement of such chamber from its ends toward its center, substantially as and for the purpose set forth.  
Also, in combination with the enlarging chamber, c, the bridges, g, g, for keeping the oil toward the center of the chamber, substantially as shown and described.  
Also, the flaring oil passages, d, e, f, substantially as shown and described.
- Also, the collar, I, placed upon the shaft, and leading into chamber, c, substantially as shown and described.
- 80,949.—SPINNING MACHINE.**—C. J. Harris, Warren, R. I.  
I claim, 1st, A cylindrical flyer, a, with a thread-guiding arm, b, hinged therein, constructed substantially as herein described.  
2d, The arrangement of the flyer, a, b, constructed as described, with the spindle, A, to which it appertains so that the relation of the two shall remain unchanged by causing both to remain in fixed planes during the spinning operation and the winding up of the bobbin, substantially as herein set forth.  
3d, The combination of the flyer, a, b, the independent traverse arm, d, the block, e, all constructed as described, with a suitably operated traverse rail, E, suitably as described.
- 80,950.—HORSE HAY FORK.**—G. W. Heath, Burlington, Pa.  
I claim the arrangement of the bars, A, A', and their points, a, a', bars, D, D', pivoted as shown, and with points, b, b', connecting bars, F, F', and lever, E, all constructed and operating as set forth.
- 80,951.—TIN CAN.**—G. E. Hegerman, Brooklyn, N. Y.  
I claim so bending the edges of the plates that form the sides of a sheet metal can, that there may be two rows, c, d, of solder at the junction of every two adjoining plates, substantially as herein shown and described.
- 80,952.—MACHINE FOR SCARPING LEATHER.**—C. H. Helms, Poughkeepsie, N. Y.  
I claim the combination of the stationary horizontal cutter with the rollers, c and e, or either of them, having their edges or peripheries beveled obliquely to the edge of the leather, substantially as herein shown and described and for the purposes set forth.
- 80,953.—HEEL TRIMMER.**—Charles H. Helms, Poughkeepsie, N. Y.  
I claim, 1st, The spindle, F, in combination with the burr-cutter, G, a collar or snapper of metal, J, at its base, substantially as hereinbefore described.  
2d, The combination of the stand or frame, A, with the adjustable table board, D, and spindle, F, substantially as hereinbefore set forth.  
3d, In combination with the adjustable table board, D, the stud or guide roller, K, substantially as hereinbefore set forth.  
4th, The combination of the adjustable table board, D, with the burr cutter, G, and collar, J, substantially as hereinbefore set forth.
- 80,954.—MILSTONE MACHINE.**—E. C. Henderson and R. A. Henderson, Albia, Iowa.  
We claim, 1st, The sliding bearing blocks, B, operated by means of the rack as herein shown and described, for the purpose of moving the millstone, A, in a horizontal motion, substantially as shown and described.  
2d, The shafts, C, D, connected by gearing, K, L, and provided with the pinions, I, and eccentric, O, when said shafts have their bearings in the sliding blocks, B, and are arranged with relation to the rack, J, and frame, A, substantially as herein described and shown.  
3d, The shaft, E, when fitted at one end to turn upon the shaft, C, and with a formed with an elongated eye, P, adapted to receive the eccentric, O, on shaft, D, said lever being arranged to be operated both vertically and horizontally within the frame, A, in the manner and by the means herein shown and described.
- 80,955.—MEAT CHOPPER.**—J. G. Hirzel, Wilmington, Del.  
I claim the combination of any convenient number of knives or blades with the intermittent rotary knife block, B, the rock, K, its toothed rotating metal pin, I, and nut or wing, m, and the pawls, n and o, and guide, all arranged and operating as described.
- 80,956.—STEAM GENERATOR.**—T. Holt, Trieste, Austria. Patented in England June 10, 1867.  
I claim, 1st, The combination of the inclined flues, E, dividing plate, E, and the removable diaphragm, I, in the marine boiler, as herein described for the purpose specified.  
2d, The combination of the flattened tube, E, composed of metallic plates, having expanded ends, and spaced internally by the balls or bars, said tubes being riveted together at their ends to leave water passages between their adjacent sides, as herein described for the purpose specified.
- 80,957.—WATER ELEVATOR.**—J. G. C. Horton, Gillespie, Ill.  
I claim, 1st, The endless chain of buckets, A, a', and the stationary crab, B, when combined and arranged as described and for the purpose set forth.  
2d, The crab, B, when provided with short levers, b, and side apertures, b', and otherwise constructed and arranged as described and shown.
- 80,958.—SCROLL-SAWING MACHINE.**—W. W. Hubbard, Manchester, N. H.  
I claim, 1st, The double yoke, A, B, supporting the slide, C, operating in combination with the bearings, K, K'.  
2d, The mode of adjusting the trusses, J, J, by means of bearings, E, E', or their equivalent, in combination with the hollow beams, D, D, substantially as and for the purpose set forth.
- 80,959.—KEY-HOLE GUARD.**—Alfred Huffnagle, Philadelphia, Pa.  
I claim, 1st, The escutcheons, E and F, stud, C, and spring, D, when constructed and used in the manner and for the purpose substantially as herein set forth.  
2d, A manner of retaining the key in the lock by the escutcheon, E, fitting into a groove in the shank of the key, against which it is pressed by a spring, substantially as herein specified.
- 80,960.—PROPELLER.**—Robert Hunter, New York City.  
I claim the oscillating lever, g, adapted to be turned upon its axis for reversing, in combination with a pivot float propeller, substantially as and for the purpose set forth.
- 80,961.—GUIDE AND MARKER FOR SEWING MACHINE.**—E. W. Ingle, New Orleans, La.  
I claim, 1st, The rock shaft, D, when constructed substantially as described, and provided with a spring, c, in combination with the slotted arm, C, when constructed and operating as set forth for the purpose described.  
2d, The combination of the plate, A, with the roller, B, spring, m and n, guide plate, E, rock shaft, D, arm, C, and edge, a, when these several parts are constructed and conjointly operate substantially as herein described for the purpose set forth.
- 80,962.—FENCE POST DRIVER.**—J. D. Israel, Utica, Iowa.  
I claim the combination of the tripod, the hammer, the rope, the sleeve, the hand wheel, and the lever, constructed and arranged substantially as described.
- 80,963.—VENTILATING HAT.**—Thomas Richard Johnson, Montreal, Canada.  
I claim a hat formed in three sections, B, C, E, and F, with their fastenings, D, and apertures, G, H, and I, combined and arranged as herein described, and for the purposes set forth.
- 80,964.—CAR BRAKE AND STARTER.**—William J. Johnson, New Orleans, La.  
I claim the combination of the angular lever, h, the elastic metallic band, j, the hinged block, k, and the counter spring, l, with each other and with the car axle pulley, g, substantially in the manner and for the purposes herein set forth.
- 80,965.—KNITTING MACHINE.**—George Johnstone, Philadelphia, Pa. Antedated August 1864.  
I claim a circular knitting machine, a series of bearded needles, arranged and operating in conjunction with a series of fingers, substantially as and for the purpose described.  
2d, Fingers, substantially as described, hung to sections admitting of separate and independent movements in the arc of a circle, substantially as set forth for the purpose specified.  
3d, Fingers, substantially as described, projecting from or forming a part of jacks, to which movements may be imparted by the devices herein described, or any equivalent to the same, that some of the needles may be covered by the fingers to a greater extent than others, for the purpose set forth.  
4th, The adjustable jacks, in combination with the guide bars, C, C', the plate, C, and the slides, 12, 13, or equivalent devices, whereby the jacks may be brought under the control of one or other of the said bars, the whole being constructed and operating substantially as and for the purpose described.  
5th, The combination of jacks, a bar or plate, C', and the slides, I, II, or their equivalents.  
6th, Jacks, substantially as described, in combination with a Jacquard apparatus, pattern chain, or pattern wheel by which the jacks are controlled through the medium of the devices herein described, or any equivalent to the same.  
7th, The sections, E, with their jacks, in combination with a Jacquard apparatus, pattern wheel, or chain operating on the said sections through the medium of the levers, F, and adjustable rollers, p, p', or their equivalents.  
8th, A presser wheel, having movable plates, secured to or forming a part of the same, so that the said plates may be controlled in the manner and for the purpose set forth.  
9th, The fingers, r, operating in combination with needles of different lengths, substantially as described and for the purpose set forth.
- 80,966.—SILVE.**—Mrs. J. D. Jones, Jersey City, N. Y.  
I claim, 1st, The dish or pan, A, or equivalent vessel, hoop, B, annular plate, C, flanged cylindrical vessel, D, wire cloth, E, and detachable hoop, F, having cross bars, G, attached to it, in combination with each other, said parts being constructed and arranged substantially as herein shown and described.  
2d, The presser and scrapers, I, J, K, L, M, constructed substantially as herein shown and described, in combination with the devices, A, B, C, D, E, F, G, as and for the purposes set forth.
- 80,967.—BALE LABEL.**—Norman C. Jones, New York City, N. Y.  
I claim the metallic tag, A, when constructed and used substantially as and for the purposes herein shown and described.
- 80,968.—HOISTING GEAR.**—W. O. Jones, Portland, Me.  
I claim, 1st, The combination of the geared wheel, f, with the gears, c and e, having common centers, in combination with the shaft, b, and the chain, h, inserted at the recesses in j, substantially as and for the purpose set forth.  
2d, The combination of the clutch, h, i, on shaft, C, with the gears, a, b, c, d, e, and gear, f, and for the purpose set forth.  
3d, The combinations of the small gears, a, b, c, d, e, both fixed and free, which act in connection with f, and which serve to revolve the face plate, F, as is the case with the gears having shafts, but also as friction rollers for the shaft, O, substantially as herein set forth.
- 80,969.—GATE.**—Munson F. Kent, West Union, Iowa.  
I claim, 1st, The vertical plate, A, connected by the chain, b, to the post, C, all constructed, arranged, and operating substantially as and for the purposes herein set forth.  
2d, The gate post, A, in combination with axle, F and cord K, by means of which said gate is raised, substantially as shown and described, and for the purpose set forth.  
3d, The vertical post, C, in combination with the cord, a' and weight w, by means of which said gate is opened, substantially as shown and described, and for the purpose set forth.
- 80,970.—FANNING AND ROCKING CHAIR.**—Thomas Kerr, York, Pa.  
I claim the combination of the platform, A, A, A, the projecting pins, a, a, the upright, O, O, with lever, B, straps, H, H, strap, F, F, pulley, B, shaft, C, C, and fan, A, as described.
- 80,971.—COMBINED FOOT REST, GRATE, AND FIRE BRICK.**—John H. Keyser, New York City.  
I claim, 1st, Constructing a circular grate or foot rest for a stove, with a receptacle for a fire brick lining, substantially as described.  
2d, Constructing a circular grate or foot rest for a stove with grate bearings, substantially as described.
- 80,972.—DOOR PANEL.**—L. W. Kimball, Pittsburg, Vt.  
I claim the panel, A, constructed with side pieces b and chambers B, with braces, arranged substantially as and for the purpose described.
- 80,973.—WAGON LOCK.**—Francis A. Kingston, Mendon, Ill.  
I claim a brake for wagons, adapted for operation by an operator on a high road, and having lever, G, block, H, racket, K, staple, S, and posts, O, O, constructed, arranged, and operating substantially as specified.
- 80,974.—REVERSIBLE LATCH.**—Jacob Kinzer, Pittsburg, Pa.  
I claim constructing the plate, A, of a reversible lock in two pieces, in the manner shown and described, and operating in combination with the latch bolt, C and spring bolt, B, which latter is confined in the lower part of the casing of the lock, in the manner shown and for the purpose set forth.
- 80,975.—SCREEN FOR MACHINES FOR TREATING COTTON.**—Richard Kitson, Lowell, Mass.  
I claim a wire screen cylinder, constructed as described, with wires soldered together at their crossings and at their shutting ends, and the ends of the screen soldered to the heads or ends of the cylinder.
- 80,976.—BRICK MACHINE.**—J. A. Laffor, Albion, N. Y.  
I claim, 1st, The self-releasing crank, I, for operating the swinging press, H, substantially in the manner and for the purpose set forth.  
2d, The method of securing the scrapers and knives, S, a in the shaft E, namely, the hooked tangs, v, in connection with keys, t, and mortised hollow shaft, E, substantially as and for the purpose set forth.  
3d, The combination of the swinging press frame, H, telescopic press box, F, A, slide, B, and driving device, d, i, e, working from the foot of the grind shaft, E, all constructed and operating in the manner shown and for the purpose described.
- 80,977.—BRICK PRESS.**—W. O. Leslie, Philadelphia, Pa.  
I claim, 1st, The tilting rack, I, constructed and arranged to operate substantially as described.  
2d, The combination of the stationary plate, C, sliding table, B, with the mechanism for operating the same, and the cams, G and H, when arranged for joint operation, substantially as set forth.
- 80,978.—SPIDER.**—Nelson Lewis, Troy, N. Y.  
I claim, 1st, The employment of the hinged joint, D, containing the stops, E, the same being constructed and arranged upon the said spider, A, and cover B respectively, and so combined as to allow or permit the said cover to swing or turn upon the upper edge of said spider, in the manner substantially as herein described and set forth.  
2d, The damper or ventilator, c, in combination with the spider, A, and cover or lid B, substantially as and for the purposes herein described and set forth.
- 80,979.—TREMULO.**—La Fayette Louis, Boston, Mass.  
I claim, 1st, In combination with a wind actuated wheel, for driving a tremulo valve, or wheel, a finger, or equivalent mechanism, for starting the wheel, substantially as described.  
2d, The employment of a finger, or equivalent device, for arresting the motion of the valve driving wheel, and for holding it stationary, substantially as described.  
3d, The valve and wheel containing cylinder, having a wind pipe and valve openings, arranged substantially as described.
- 80,980.—HYDROCARBON BURNER.**—David H. Lowe, Boston, Mass.  
I claim the within described apparatus, for producing gas for illuminating purposes, substantially as set forth.  
Also, the combination of a lamp burner with the reservoir, D, for containing the naphtha or gasoline, substantially as described.
- 80,981.—APPARATUS FOR TANNING LEATHER.**—Hiram Lucas, Rowsburg, Ohio.  
I claim the adjustable rack frame, B, and cleats or bearings, I, upon which the frame is pivoted when in operation, in combination with the vat, the said frame being raised or lowered with its load of skins by means of the windlass, substantially as and for the purpose set forth.
- 80,982.—LOOM.**—James Lyall, New York City.  
I claim, 1st, A vibrating lay and a reciprocating shuttle, adapted to passing, either end first, between the warps, in combination with a carrier, provided with actuating rollers that are moved across the vibrating lay on the other side of the warps, and to which an independent rotary motion is communicated in the same direction that the rollers would be rotated by contact with the warps substantially as and for the purpose specified.  
2d, In combination with the reciprocating shuttle and lay, a shuttle driver, provided with rollers, substantially as described, so that the rollers that come in contact with the warps are rotated by contact with the rollers that supported the shuttle driver, substantially as set forth.  
3d, The reed and lay, have a raceway, I, and a shuttle rail, w, substantially as set forth, in combination with the reciprocating shuttle driver and the shuttle that is actuated by said driver, substantially as set forth.  
4th, A vibrating lay, in combination with a reciprocating shuttle, and a shuttle driver, that operates upon the shuttle during its entire reciprocation, the warps intervening, substantially as set forth.  
5th, Two or more moving pulleys, combined with the said shuttle driver and connected to the same, substantially as set forth, so as to multiply the movement in operation on the shuttle driver, as specified.  
6th, The cams, operating substantially as specified, to stop and start the shuttle gradually, and operate while the lay is stationary, in combination with the cams for operating the lay while the shuttle is stationary, substantially as set forth.  
7th, The cam, w', formed of a flange, in combination with the two rollers that are connected with the lay, one of which is yielding, and between which said flange moves, substantially as set forth.  
8th, The shuttle driver, substantially as specified, in combination with cords, or their equivalents, that pass off on opposite sides, and are connected to the actuating mechanism at or near the line of the axis of fulcrum of the lay, substantially as specified.
- 80,983.—DOOR BELL.**—Thomas Lyons, Hartford, Conn.  
I claim the arm, g, in combination with the incline elevating, i' on head, i, and hammer, d, arranged and operating substantially as and for the purpose set forth.
- 80,984.—LAMP BURNER.**—L. J. Marcy, Newport, R. I.  
I claim, 1st, The arched perforated plate, b, arranged between the wick tubes, whereby the upward current of air from the chamber, B, is broken, to prevent the formation of eddies when it encounters the lateral current which enters through the perforations in the upper chamber, A, as herein shown and described.  
2d, The cap or cone, C, when formed with two abrupt lateral shoulders, g, g, substantially as described, and for the purpose set forth.
- 80,985.—BREECH-LOADING FIRE-ARM.**—James E. McBeth, New Orleans, La.  
I claim, 1st, The bolts, C, C', center piece, D, and spring, E, in combination with the projections, d and e, and spring, H, for the purpose of opening the breech by the half-cocking of the piece, substantially as and for the purposes herein set forth and described.  
2d, The cap or cone, C, when formed with two abrupt lateral shoulders, g, g, substantially as described, and for the purpose set forth.  
3d, The elongated slots, k, k', and holes, l, l, in combination with the pivots, i, i', and spring bolt, m, for the purpose of removing the lock box from the chamber, and preventing it from falling out at random, substantially as herein set forth.  
4th, The cartridge ejector, J, constructed as described, in combination with the cam, o, on the front pivot, i, for the purpose of ejecting the shell of the old cartridge, substantially as set forth and described.
- 80,986.—FILE-FASTENER.**—E. P. McCeney, Washington, D. C.  
I claim a handle to the lever of a file-fastener, substantially in the manner and for the purpose herein described.
- 80,987.—CAMP-STOVE AND OVEN.**—D. C. McNeill, De Witt, Iowa. Antedated August 1, 1868.  
I claim, 1st, The folding stove, when its sides are hinged together at the angles by the vertical rods, O, extending below the stove, at a, for the purpose of being inserted into the ground, whereby the ground is made to form the bottom of the stove, upon which the fire is built, as herein shown and described.  
2d, In combination with the folding stove, having the open bottom, the chimney, L, when composed of sections hinged together, and adapted to fold down upon the top plate, G, as herein shown and described.  
3d, The radiating oven, F, constructed as described, its top and sides hinged together at the angles, and secured to the frame, H, and to the back plate of the stove, by the extended pinules of the hinges, C', c, as herein described, for the purpose specified.
- 80,988.—CORSET, ABDOMINAL, AND SKIRT SUPPORTER.**—John McNeven, New York City.  
I claim the corset and skirt supporter, constructed as described, of the sections, A, B, C, D, cut out upon the hips, and extended in front to constitute the cover the abdomen, and the stiffened section, E, removably attached at its ends to the extended portion of the section next the hips, substantially as described, for the purpose specified.
- 80,989.—SPRING AND DUSTER FOR WATCH.**—John H. Morse, Peoria, Ill.  
I claim the metal case, D, with its steel spring, F, to be used as a "lift spring" and "duster" for watch cases, in the manner and for the purpose specified.
- 80,990.—CASTER FOR FURNITURE.**—Hezekiah Munroe (assignor to Albert F. Munroe, Fall River, Mass.).  
I claim the arrangement in the horizontal friction roll, C, bearing against the inner surface of the chamber, B, formed at the lower end of the case, E, said spindle being held within the case by the flange, e, and shoulder, f, all constructed as described, for the purpose specified.
- 80,991.—TAILOR'S SEAT.**—Friedrich Neuhaus, Belleville, Ill.  
I claim, 1st, The combination of the leg cushion, F, with the bar, E, socket, a, rod, D, pipe, G, socket, a, and spring, H, all made and operating substantially as herein shown and described, for the purpose of making the said cushion at once elastic and adjustable.  
2d, The combination of the seat, A, and hinged seat back, B, with the spring, j, arm, s, and gage screw, l, all operating substantially as herein shown and described.
- 80,992.—ROAD GATE.**—E. Nicholson, Rockport, Ohio.  
I claim pivoting the gate at a, and to the arm, G, in combination with the shaft, F, and arm, E, operated by means of the starting bars and rods, as and for the purpose set forth.











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