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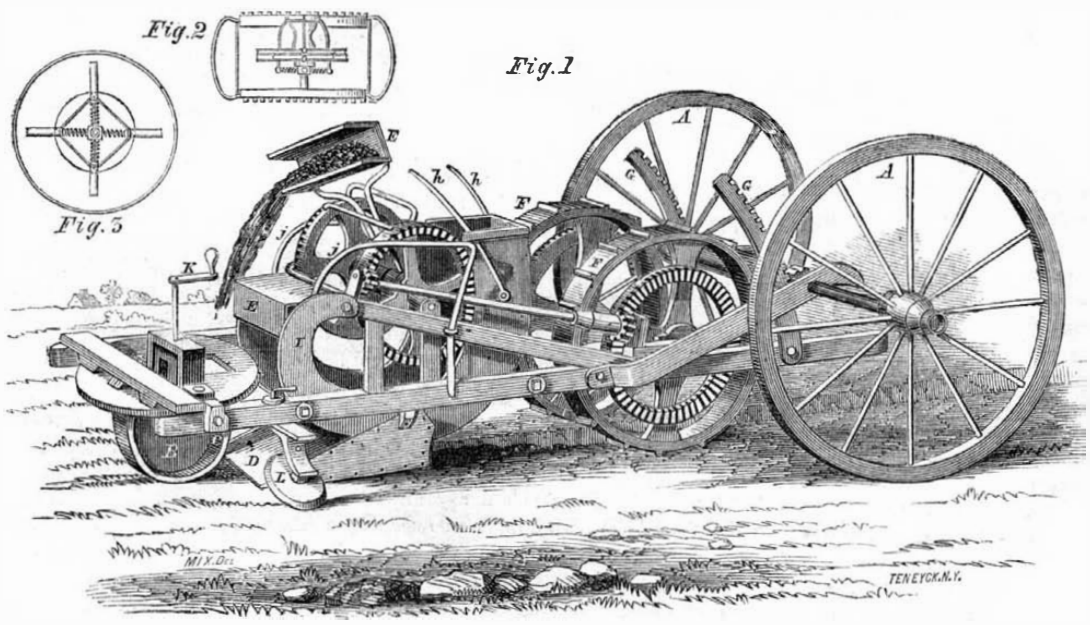
IMPROVED EXCAVATOR

The annexed engraving illustrates an excavating machine invented by Isaac A. Benedict and G. W. Cummings, of Conneaut, Ohio. It is designed to be drawn by oxen or other animals, taking the earth out from the middle of its track and depositing it on one side as it moves along, the machine operating in the following manner.

The machine runs upon the two large wheels, A A, and the castor, B, loosening the ground as it passes along by means of the coulter, *c*, and scraper, D. The loosened earth is then gathered from the scraper by means of the revolving buckets, E E, which as they rise, are tilted over, emptying the dirt at the side of the machine in the manner shown. The revolving buckets are carried around by cog wheels which are connected in the manner clearly represented in the engraving with the driving wheels, F F, a greater or less portion of the weight of the machine being thrown upon these driving wheels by carrying the shaft of the wheels, A A, up or down the geared segments, G G.



BENEDICT & CUMNINGS' PATENT EXCAVATOR.

The buckets are caused to discharge at either side of the machine as may be desired, by means of the guide rods, *h h*, one of which is brought into play to deflect the buckets to each side. As the buckets continue their revolutions, they are brought back between the sides of the scroll, I, by the guide rods, *j j*. The depth to which the coulter and scraper enter the ground is regulated by varying the hight of the forward part of the machine on the castor, B, by means of the screw, K. As the depth of the ditch increases the machine is let down below the level of the axle of the wheels, A A, by turning down the cogged segments, G G, and the position of the machine laterally is determined by sliding the axle of the wheels, A A, in the sleeve through which it passes for this purpose, the position of the forward end of the machine being controlled by the inclined roller, L.

The buckets, E E, are attached to the shaft about which they revolve, in such manner that they may yield inward toward the center on encountering any rigid obstacle. This mode of securing the buckets is clearly shown in Figs. 2 and 3, the arms being pressed outward by spiral springs.

This machine is as well adapted for excavating and dredging, as it is for ditching.

The patent for this invention was granted on the 15th of May, 1860, and further information in relation to it may be obtained by addressing the patentees, at Conneaut, Ohio.

SCALE IN STEAM BOILERS.

The scale in steam boilers almost always consists of either the sulphate or the carbonate of lime, and as a general rule, it forms only when water is used containing one of these salts in solution. The mode in which the sulphate of lime is deposited is this: It requires 450 pounds of boiling water to dissolve one pound of the sulphate of lime, and, though the water when placed in the boiler may not contain this proportion of the sulphate, yet, as evaporation proceeds, a portion of the water is carried off, while the salt not being volatile, all remains in the boiler, constantly increasing the strength of the solution until the water becomes saturated, when any further evaporation causes the salt to assume the solid form. The sulphate of lime thus precipitated, is drawn by a mysterious law to attach itself to any solid substance with which the water may be in contact, hence the formation of the scale on the boiler.

The precipitation of the carbonate of lime is produced by a different process. This salt is scarcely soluble at all in pure water, but it is soluble in a mixture of water and carbonic acid, and as the first action of heat on the substances in the boiler is to drive off the carbonic acid, the water which remains is incapable of holding the carbonate in solution, and it is accordingly immediately precipitated in the solid form, cleaving like the sulphate to any solid substance with which it may come in contact. Strictly speaking, the carbonate results from the decomposition of the soluble bicarbonate.

The precipitate may be prevented from adhering to the boiler with bran, chalk or other solid substances in minute particles; when the salts of lime will form a thin scale over each of these pieces, and will be blown out when the stop cock is opened for this purpose. This is the most common method in use for preventing the formation of scale.

Another plan which has been tried in various modifications, is the arrangement of a vessel in communication with the lower part of the boiler, but not in contact with the fire, into which the solid matter may fall, and where it will remain in consequence of the water not being in ebulition. On page 178 of the current volume we published the translation of a very lively description of the re-invention in France of this old device which has been long known in England and this country. The plan for some reason does not seem to be entirely successful.

When the impurity in the water consists wholly of bicarbonate of lime, this salt may be precipitated and removed before the water is put into the boiler, by the addition of just the right quantity of lime. But this is a delicate operation and would be hardly likely to succeed, except in the hands of a skillful and experienced chemist.

The best of all modes for preventing the formation of scale, is to use pure water where this can be obtained.

There have been many substances offered for sale at high prices for dissolving the scale after it is formed. But there is no substance known to chemical science, that will dissolve any considerable quantity of either sulphate or carbonate of lime which will not also dissolve iron. If, therefore, any person has produced such a substance, he has not only rendered a service to the mechanic arts, but he has made a very important discovery in chemistry which will bring him fame as well as money. The scale once fastened to the boiler, we know of no way of separating the two but by means of the chisel and hammer.

HYPNOTISM. — The French scientific journals are full of accounts of the application of the new discovery, hypnotism. In *Cosmos* we find a detailed account of an amputation performed while the patient was under its influence in the Hotel-Dieu of Poitiers, on a man aged 34, whose left knee was increased by white swelling, to nearly double the size of the right knee, and was so painful that the least movement produced the most intense suffering. The hypnotism was produced by placing a spatula about eight inches in front of the root of the nose. Looking at this he soon become insensible, in spite of the severe pain which he was in from being taken to the operating room. Insensibility was produced in ten minutes, and the amputation occupied a minute and a half. The patient made no sign of pain, and when questioned by the doctor said he thought he was in Paradise. His features were perfectly tranquil; his eyes only seemed to be wandering in search of the brilliant object which had been before them. Hypnotism is not safe for the patient. M. Giraud-Tenlon says that a lady whom he hypnotized made so free with her confidences, that he, for fear of grave results to her, was obliged to awake her. He thinks that the loss of free will and conscience, with the preservation of memory, the passions and the power of speech, does not make up a desirable state. A very singular experiment has been many times repeated in France. It consists in marking a chalk-line along a floor, and placing a hen whose beak also has been whitened with chalk in the axis of the line and nearly touching it. She soon sinks into the most complete hypnotic sleep, accompanied by insensibility and catalepsy, by blowing gently on her eyes she is awakened, and immediately shakes herself, flaps her wings, and runs away with much squawking.

The great transatlantic balloon has again burst.

JOURNAL OF PATENT LAW.

INFRINGEMENT—PATENT FOR COLORING YARN—OLD AND NEW METHOD OF PARTI-COLORING.

We think it very important that inventors should understand the law of patents. To understand the mechanism of the government under which we live; to be familiar with the principles which control its policy, is a branch of education, the importance of which has been recognized by ancient as well as modern legislators, and in a citizen of a republican State it is essential to the maintainance intact of the government itself. If, then, it is important to understand the general laws of one's country, in which we are interested merely as citizens, how much more important is it that mechanics should understand those laws, the construction of which affects so directly the pecuniary interests of the inventor?

For the benefit of our readers, we have opened a department in our journal for the illustration of the principles which govern in the interpretation of Letters Patent, and in the construction and application of the patent laws. We might give merely the dry principles of law, without showing their appl cation to special cases; but we think that they would be less likely to be understood by the mass of our readers, and certainly less likely to be remembered. Hence we give, as our readers have already perceived, reports of cases determined by the courts in which, after certain facts are found, the legal principles applicable to them are considered and applied, and a decision rendered. Thus, the attentive reader, having become in a measure familiar with the legal method of reasoning, as well as the more familiar principles of patent law, will apply them in the consideration of his own cases, and his own rights being better understood, a saving both in mind and pocket will be likely to be the result.

We give, this week, the case of Smith *vs.* Higgins, decided by the United States Circuit Court, in which the plaintiff sought a judgment against the defendant for an alleged infringement of a patent for an "improvement in apparatus for parti-coloring yarn."

The patentee recites that yarns, heretofore, have been parti-colored either by printing or dipping skeins in a vat of dyeing liquor, with the parts not to be colored tied or clamped so as to exclude the dye, and states the difficulties attending the use of these modes, and also the nature of his own invention, namely, that it consists in coloring yarns that have been reeled by direct immersion in the dye, by means of movable frames adapted to receive and hold the skeins, and so combined with the dye vat as to admit of letting down the yarns to the determined measured distance, and then withdrawing and shifting them as required; and after giving a detailed description of the machinery used by him, he winds up by claiming "the method substantially as specified of parti-coloring yarns that have been reeled, by direct and free immersion, by means of frames carrying the reeled yarns, and combined with the vat containing the dyeing liquor, by means of machinery adapted to let down and draw up the said frames, and measure the extent of immersion, substantially as set forth."

The yarns to be parti-colored are wound around two reels particularly described in the specification, and then the frame is suspended on a horizontal frame, also described; and as many of such reel frames, containing the skeins of yarn, as the horizontal frame will carry, can be in like manner suspended. A scale is then applied to one of the reel frames, and by turning a crank handle, the whole is let down into the vat to the depth desired, as indicated by the scale, depending on the figure to be produced. These reels may be inverted to dip the other end of the skeins in like manner, in the same vat, or in one of any other color, or the reels may be turned to bring other parts of the skeins in position to be immersed in the same vat, or in a vat of another color.

An idea of the machines which it was alleged were infringements upon this patent will be gathered from the opinion of the Court, rendering judgment for the defendant, a portion of which we give.

Nelson, C. J.—"The claim is not entirely free from difficulty in its construction. The phrase 'by means of frames carrying the reeled yarn,' may embrace not only the horizontal frame, upon which the reels are suspended, but the reel frames upon which the yarn has been reeled. The difference in the construction is material, for, if the reel frames are included, then the combination with the vat would be a different one from that on which the horizontal frame alone is embraced. Assuming, for the present, that the horizontal movable frame only is embraced, then the claim consists of a combination of this frame carrying the reeled yarns and the vat containing the dyeing liquor, by means of machinery adapted to let down and draw up the said horizontal frame, and measure the extent of the immersion, substantially as described. The parts are not claimed—the combination only.

"The idea of parti-colored yarn in skeins, by free immersion in a vat containing the dyeing liquor, was not new, nor the measuring the extent of the immersion at the same time. The novelty consists in the machinery or means by which the parti-coloring is effected in equal and measured proportions; and, conceding the novelty of this combination, which we think is fully established by the evidence, the material question in the case is whether or not the means or machinery used by the defendants infringe upon it. In other words, do they use the combination of the horizontal frame carrying the reeled yarns, and the vat by means of the patentee's machinery, to let down and draw up the said frame and to measure the extent of the immersion, or do they use the combination by equivalent means?

"After the best consideration we have been able to give the case, we have come to the conclusion that these questions must be answered in the negative. We have already said that the idea of dyeing parti-colored skeins of yarn by free immersion into the dye, and at the same time gaging or measuring the extent of coloring of the skein, was not new—the idea is not the patentee's. He is entitled to the merit only of embodying it into machinery and adapting it to practical use in a new and superior mode to any that had preceded it. And in order to establish an infringement against the defendants, he must show that they are employing substantially the same description of machinery. If they employ machinery of a different description, a different mode of accomplishing the same result, the patentee has no ground of complaint.

"Now, in the first place, the defendants do not employ the reel frames of the patentee, upon which the skeins of yarn are reeled or placed, at all, nor any equivalent for the same, nor indeed any arrangement resembling them. And hence there is no necessity for the horizontal movable frame found in the patentee's combination, in the defendants' arrangement, as this horizontal frame is important only as connected with the reel frames. Nor is there, in fact, any frame resembling the peculiarities or functions of the horizontal frame employed by the defendants. And the machinery for letting down in and drawing up the skeins of yarn from the liquor in the vat, used by the patentee, is altogether different from that used by the defendants; and there is no arrangement at all used by them for measuring the extent of the immersion by machinery. By the arrangement of the defendants, the skeins of yarn are stretched upon two poles, one above the other, and while thus situated, the skeins are clamped by a clamp of wood, at a distance from the bottom desired to be colored, or rather fixing the measure of immersion. This clamp is attached to a frame independent of the two poles which support it. The poles are then withdrawn and the clamp frame attached to and carried by a lever operated by machinery, to the vat of liquor, and lowered into it; the clamps, which float, determining the extent of the immersion. This extent is not determined by the machinery, as in the patentee's arrangement, but is fixed in advance by the hand of the operator.

"The truth is that the defendants' device is but an ingenious improvement and adaptation of the old mode of parti-coloring by clamping the skeins of yarn and immersing them in the vat. Instead of immersing the entire skein, separate portions are colored at the same time, the clamp serving to exclude or stop the coloring material, and at the same time determining the extent of the immersion, this depending upon the portion of the skein to which the clamp is applied. I am entirely satisfied that judgment should be rendered for the defendant."

OUR PATENT LAWS—THEIR WONDERFUL INFLUENCE.

Much has been said on all sides in regard to the recent extension of the patent for sewing machines for 7 years more. Such an extension cannot be worth less than five hundred thousand dollars, and we do not see that it may not be worth nearer five millions. In the first place, the proprietors have already reaped half a dozen fortunes out of it; and in the next, enormous quantities are manufactured by other parties, paying five dollars in each case for the use of the patent. During the next seven years the business will be pushed, no doubt, and if every family in the United States is not supplied with one, it will be no fault of the men who are interested in its extension. Whether, upon the whole, this extension is a fair thing, might be difficult to decide; but this, at least, is certain, that the price has been lowered more than one-half very considerably, and yet there is no lady who has bought and has used one at a hundred dollars, who would sell it again at that price if she could not get another.

It is also certain that the patent system—that is, both the laws and their administration, are more equitably worked, and more beneficial in their operation in this country than any other on the globe. It costs less to secure the right, and yet the department is self-sustaining. It provokes more ingenuity and skill, beeause it secures to each man the benefits of his labors and inventive genius, and yet it does not give rise to any such serious or selfish monopolies as to prevent new inventions from coming into use. The few enormous fortunes that are realized only stimulate others, both to invent and to record their inventions, or to invest capital in bringing such inventions as can be made useful into public notice. The thousands of protests that die as soon as born, are the best proof of this fact.

Once in a while, however, something really good, great, and generally useful is struck out, patented, improved, advertised, and runs through the country with a rapidity and labor-saving effect truly astonishing. A sewing machine, a telegraph, a process for utilizing india-rubber, huve each produced a wonderful effect upon American habits and comforts, while in Europe they are comparitively unused from their excessive cost. The new milking machine, invented by a young man whose father was a large owner of cows, a machine that fairly pumps the milk out of the cow more naturally and easily than anything except the mouth of the calf, is one of these machines that promise remuneration to the inventor, and improvement in an operation practiced from the infancy of our race, or at least of civilization, without the idea that it ever could be improved.

The farmers now are doing everything in fact by machinery, and patents are to be found by the hundred for machines for every operation of man or horse in farm work. Steam plows to turn up the ground, patent harrows and drills to break clods and sow the seeds, mowing machines and reapers, threshing machines and fans, all are to be had in abundance and variety, through the agency of the patent system, far better in quality than those of England and far cheaper. All that used to cost man toil is accomplished by horse power, and it is confidently asserted, and we believe it will prove true, that steam will be made so flexible as more cheaply and easily to accomplish all the work of the traveler now performed by horses, whether it be plowing or hauling, reaping or threshing, traveling on the ordinary high road, or on the ice as well as the water, going straight forward at any pace from one to thirty miles an hour, or turning a corner with perfect ease and manageableness, throwing water like a deluge on the roofs of houses and barns to extinguish fires, or carrying a body of flying artillery, or a regiment of what used to be cavalry, into action at twice the speed and with twenty times the precision and effect of horses. In fact, the iron horse will soon become an antiquated term, and the steam elephant become all the rage. Such are some of the problems which are now being wrought out as the result or our patent laws.—*Philadelphia Ledger.*

THE largest furniture manufactory in Cincinnati employs over five hundred hands, and turns out over half a million dollars' worth of goods every year. The flooring of its building and sales-rooms together occupy an area of over five acres, and the proprietors are erecting a new building 7 stories high and 150 by 80 feet base.

AMERICAN NAVAL ARCHITECTURE.

THE STEAMER "JOHN P. JACKSON."

This steamer is intended for service between New York and Jersey City, and is owned by the New Jersey Transportation Company. It is pronounced to be the largest steam ferry-boat in the world. It is certainly one of the most capacious and splendid boats of its kind in our rivers. Her dimensions, with particulars of machinery, we subjoin:—

Length on deck, 210 feet; length at load line, 210 feet; breadth of beam at midship section (molded), 33 feet; depth of hold, 13 feet; depth of hold to spar-deck, 13 feet; draft of water at load line, 5 feet 6 inches; area of immersed section at the above draft, 140 square feet; tunnage, 860 tuns.

Her hull is of oak, locust, &c., and very securely fastened with treenails, spikes, iron, &c. The floors are molded 14 inches, and sided 6 inches. Distance of frames apart at centers, 12 inches.

The *John P. Jackson* is fitted with one vertical beam condensing engine; diameter of cylinder, 45 inches; length of stroke of piston, 11 feet; diameter of water-wheels over boards, 21 feet; material of wood; length of wheel blades, 9 feet; depth of same, 12 inches; and 18 in number.

She is also supplied with one drop flue round shell boiler; length of boiler, 30 feet; breadth of same, 10 feet, and is 10 feet in hight, exclusive of steam chimney; number of furnaces, 2; length of grate bars, 6 feet; number of flues above, 6; number in center, 6; number below, 4; internal diameter of those above, 15½ inches; internal diameter of those in center, 15 inches; internal diameter of those below, two of 23 inches, and two of 19 inches; length of those above, 18 feet; length of those below, 17 feet 10 inches; length of those in center, 15 feet 10 inches; possesses one smoke-pipe, fitted with slip joint; diameter of this, 4 feet 6 inches; and its hight, above grate surface, is 48 feet; boiler is located in hold; bunkers of wood; the engine is fitted with expansion gear, cut off one-third.

She also has one independent steam fire and bilge pump, with valves to all openings in her bottom. Her cabins will be handsomely fitted up, and very commodious. Contrary to general usage with such vessels, her bottom was entirely coppered from the start. It is customary not to copper them until they have been running for six months. Her aggregate cost will be $55,000. She will take her appropriate position on the Jersey City line about the middle of October. The hull of this steamer was constructed by Devine Burtus, of Red Hook, L. I. Machinery by William Birkbeck, of Jersey City.

THE STEAMER "ZOUAVE."

This fine steamer, erected in New York by John Englis, will soon assume her appropriate position on the route of her intended service—New York to Cape May *via* Philadelphia. Her model betokens a rare combination of speed with sea-going qualities, and she is confidently expected by her builder to prove a success. We herewith subjoin the particulars of her hull, &c.:—

Length on deck from fore part of stem to after part of stern post (above the spar deck), 230 feet; breadth of beam at midship section (molded), 30 feet; depth of hold, 12 feet; depth of hold to spar deck, 12 feet 3 inches; draft of water at load line, 6 feet 6 inches; area of immersed section at the above draft, 175 square feet; tunnage, 800 tuns.

Her hull is of the best white oak, chestnut, &c., which is made very securely and square fastened with copper, treenails, &c. The frames are molded 14 inches; sided 6 inches, and 24 inches apart from centers; these frames are strapped with diagonal and double-laid braces, thereby insuring great durability.

The *Zouave* is fitted with one vertical beam condensing engine; diameter of cylinder, 50 inches; length of stroke of piston, 11 feet; diameter of water-wheels, over boards, 31 feet; material of same, iron; length of wheel blades, 7 feet; depth of same, 2 feet, and their number is 27.

She is also supplied with one return flue boiler, located in the hold; length of boiler, 27 feet; breadth of same (front), 13 feet, and its hight (exclusive of steam chimney) is 11 feet 3 inches; number of furnaces, 2; breadth of these, 5 feet 9½ inches; length of grate bars, 7 feet 6 inches; number of flues above, 20; number or same below, 10; internal diameter of those above, 10 of 8½ inches and 10 of 9½ inches, and the internal diameter of those below, 2 of 22½ inches, 4 of 15 inches and 4 of 17 inches; length of flues above, 20 feet 8 inches; length below, 14 feet; diameter of smoke-pipe, 4 feet 4 inches; boiler has no water bottom. The engine is fitted with H. Winten's patent expansion gear; point of cutting off, one-half.

Ample protection has been made against communication from fire by the boiler in the shape of felt, zinc, iron, &c. She has one independent steam fire and bilge pump, bilge injections, and ordinary valves to openings in her bottom; bunkers are of iron; has two masts, and is schooner rigged. This vessel is furnished with Ingersoll's metallic life-boats; has a promenade deck, saloon cabins and staterooms—all very commodious, and handsomely fitted up. Owners of this steamer, Sanford's Independent Line; machinery constructed by the Morgan Iron-works, this city.

WHICH WAS THE FIRST STEAMER THAT CROSSED THE ATLANTIC?

MESSRS. EDITORS:—On page 199 of the present volume of the SCIENTIFIC AMERICAN, I find an article headed "The First Steamer that Crossed the Atlantic," which does not corroborate the statements made in the *Engineer and Machinists' Assistant*, published by Blackie & Sons, Glasgow, Scotland. This publication says (on page 20) that the *Great Western*, which made the passage in 1838, was the first steamer that ever crossed the Atlantic. Please inform me, in your next issue, which to believe, or where the information is got from.

J. S.

Ansonia, Conn., Oct. 10, 1860.

[If our correspondent was familiar with the writings of the English, he would know that it is the practice of that wonderful people to claim to be the authors of all great discoveries and the pioneers in everything. Do they not universally call the re-action water wheel, which was known before the Christian era by the name of "Barker's mill?" and is not the calcium light, which was discovered by Professor Hare, of Philadelphia, designated in all the English publications as the "Drummond light?" Though the Liverpool papers of Sept. 22, 1819, announced the arrival of the steamship *Savannah*, still, as the *Great Western*, which crossed in 1838, was a *British* ship, of course she was the first one that crossed. The English are a great people; they beat other nations in many respects, but the thing in which they get farthest ahead is in *boasting!*—EDS.

CAN SPENT TAN BARK BE DRIED?

MESSRS. EDITORS:—We s w, on page 177, present volume, of your journal, that in Paris the gas-works had to employ additional clerks to sell the gas tar which was used in making fuel of sawdust, tan, &c. We are tanners, and make a great deal of tan, which is of very little use to us; in fact, it is an expense, and we have gas-works here from which we could get the tar, to mix with the tan and then mold it; but we do not know how we could dry it, unless there is something to mix with the tar that will make it dry. If you have any knowledge of the process or of any substance to make it dry after it is molded, we would like to know it, as the sun will not dry it. It would be a very valuable thing to most tanners located in cities. We are constant readers of your paper, and are indebted to it for valuable suggestions and information. We procure it of Geo. E. French, bookseller, of this place.

Yours, respectfully, C. C. SMOOT & SON.

Alexandria, Va., Oct. 5, 1860.

BUTTER MAKING.—Every improvement which facilitates the making of high quality butter is of deep interest and importance to agriculturists. We do not hesitate therefore to point attention to the subject of glass milk-pans, which have been introduced into this region. Experience has shown their extraordinary value in the dairy, by the saving of labor, and the securing of cleanliness and sweetness in the manufacture.

[We quote the above from an *Irish Agricultural Journal*. If we mistake not glass milk-pans have been used to some extent in this country, but with what success we are not advised.—EDS.

ERRATUM.—In describing Mr. Selfridge's pump, on page 216, the printer made us state the patent was secured through this office; this was a mistake.

MAKING MAGNETS IN CASTING.

MESSRS. EDITORS:—Permit me to trouble you with an experiment, made a few days ago for particular purposes, one of which was this. On the suggestion that there might be some truth in "Ampéres" theory, (that in iron each atom has polarity, but being placed promiscuously they neutralized each other, but when a magnet was applied, the polarity of the atoms or the atoms themselves were all brought in one direction, and the ordinary iron became a magnet until the true magnet was removed, and then the magnetized iron resumed its former condition). The object being to give a permanency to the polarity of the atoms, a ring helix was attached to a small battery, and placed in the sand, and melted iron poured in a mold forming a bar ½ an inch square, and 10 inches long, directly through the center of the helix; and when cooled off was found to be a good magnet, much stronger than the cast bar which had been placed cold in the helix and subjected to its influence.

Again an iron and a steel bar of same size were severally placed (cold) in the helix, and a sledge placed at one end, and being struck on the other, with a view to fix the polarity permanently, it was found that they were pretty good magnets, indeed better and possessing twice the power of the one not subjected to the blow of the hammer. No other trials were made at this time, the results shown may have been accidental, other trials might vary, but it is thought not.

As iron even falling through a helix becomes magnetized, why may not this explain the magnetism of meteoric stone, which must pass through the magnetic influence encircling the earth, and the blow of the stone in falling on the earth, may fix the polarity of the stone.

R. T. K.

Philadelphia, Pa., October. 12, 1860.

[Since the invention of the electric telegraph, the old fashioned permanent magnet is almost forgotton; we think of it only as a curious toy, but somewhat useful for picking up small tacks or fine needles. We are pleased that our correspondent calls attention again to this subject, it certainly is not exhausted. The discovery of a simple and sure process of making the most powerful magnets may lead to uses never dreamed of.—EDS.

A WONDERFUL CASE IN SURGERY.

Professor Busch, superintendent of the hospital of Bonn in Germany, communicates to the medical journals the history of a case almost as remarkable as that of the famous St. Martin, who has been living so many years with a hole in his stomach, allowing people to look in and see the process of digestion going on inside. A woman was brought to the hospital of Bonn, who had been gored sometime previously by a cow, wounding her in the abdomen. The injury resulted in a fistulous opening through the walls of the abdomen into the upper third of the small intestines. The result was that as soon as the woman commenced to eat, the food would begin to run out of the opening, and though her appetite was ravenous, she had become very much emaciated when she was admitted to the hospital. Dr. Busch tried the plan of injecting soups through the opening directly into the intestine, even crowding in little pieces of meat and bread with his finger. Under this odd mode of feeding the patient thrived and gained flesh rapidly. Of course, Professor Busch seized this rare opportunity to make a series of physiological investigations, which have proved to be very interesting.

The fact of greatest practical value observed, was that the gastric and other juices by which digestion is effected, are secreted in much greater abundance when several kinds of food are taken into the stomach, than when a meal is made of a single article. This confirms the latest conclusions of other physiologists, and is useful knowledge as a guide to action. Dyspeptics can commit no greater blunder than to confine themselves to a very few articles of diet. It is best for us all to eat a variety of food at each meal.

KEEPING MILK SWEET.—A correspondent of the *Homestead* found that, in sending milk to market, though it left the dairy perfectly sweet, it was often curdled on delivery to customers. To remedy this, the cans were covered with cotton cloth soaked in salt water. By this method the curdling of the milk was prevented.

IMPROVED WATER WHEEL.

In regard to the wheel here illustrated the inventor says:—

My improved water wheel is designed, and, from practical experience, does use water very economically under varying heads with a given amount of work, and also as well under a constant head and a varying amount of work.

For example, I have a mill with four run of stones, driven with one wheel, all of which can be run during one-half of the year; but for a large portion of the other half, there is no more water than would do a fair business with one run of stones, with a wheel just adapted to the single run and the water. Now, this water that will do a fair business in this way, if applied to the larger wheel—of ordinary construction—would not move the stone, the runner being raised clear of the bedstone. Now, what I want understood is, if one of my wheels were used capable of driving the four runs of stones, one run of stones can be driven by the same wheel with a trifle over one-fourth of the water used to drive the four runs.

In support of the above, I give some data of their practical working. My first wheel took the place of a 4½-feet whirlpool wheel (so called), drawing 228 square inches of water. This wheel would fairly drive a large heavy grindstone, 5-feet diameter, for grinding files; and could be stopped with heavy 1½-inch wide files.

My wheel, which took the place of the old one, is 30 inches diameter, and is limited to 216 square inches of opening. With 40 square inches of water it run the stone, doing a good business, and could not be stopped; the more it is slacked the harder it pulls.

This wheel also ground 10 bushels of meal in an hour, when there was so much backwater as to reduce the head to 3 feet 5 inches; the wheel being over six feet under water.

The second one is used to drive a batting mill, containing the necessary machinery, consisting of two of Calvert's willows, two five-cylinder dusters, a lapper, and 12 old-fashioned woolen cards, with workers and strippers; working off 20 bales of batts per day. There is about one hundred feet of shafting, besides counters and wheel shaft. The head is 8 feet 8 inches. The wheel is 30 inches in diameter, and has 216 square inches of gate opening, which will vent about 160 inches of water. Twenty-four square inches of water will run the shafting and loose pullies up to usual working speed. Twelve square inches will start the same, and seven inches will just barely turn it. One hundred and thirty square inches of water drives all the work up to speed, and is the most I have seen used of late. 21.13 cubic feet of water per second is the solid amount of water used by measurement.

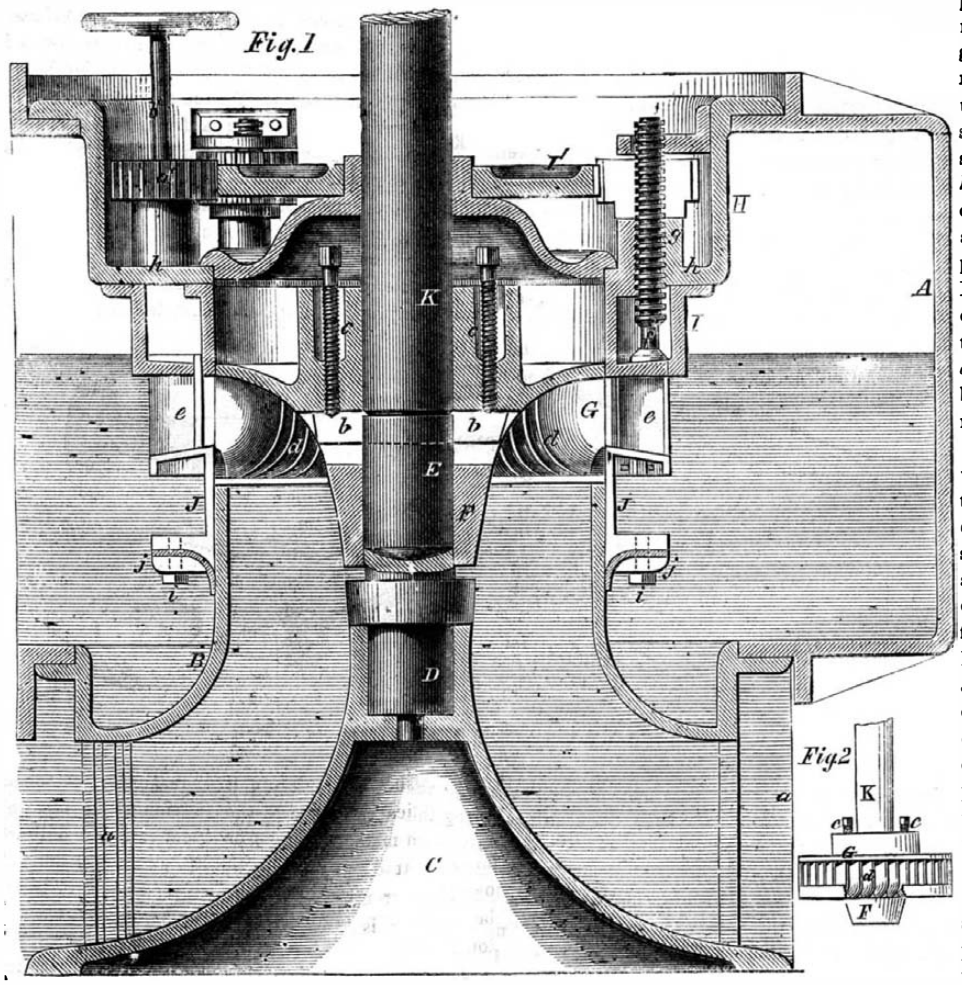
The third wheel drives Messrs. Calvert & Sargent's mill at Graniteville, Mass. Length of mill, 180 feet; width of mill, 50 feet; hight of mill, 2 stories. One end—80 feet in length—is occupied by the owners as a machine shop, in which are planers, engine and hand lathes, and circular saws, giving employment to from 35 to 40 hands.

The other 100 feet is occupied by the Abbott Worsted Works, with 1,310 spindles, 5 cards, with the necessary combing and picking apparatus, employing 35 hands and using 1,000 lbs. of stock per day.

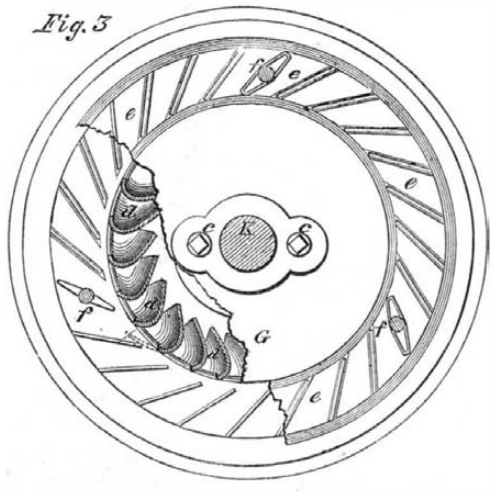
The head is 18.82 feet. Wheel, 30 inches diameter, with a capacity of discharge of 160 square inches. Square inches used, 82. Cubic feet discharged per second, 19.7; being equal to 42.13 H.P. of water used, and a trifle over half the full capacity of the wheel. If anybody can beat this, I should like to see the apparatus.

This wheel was patented May 15, 1860, and was put through by the Scientific American Patent Agency in the short space of six weeks, from the day the specification was signed until the Letters Patent were in my hands. It seems to me that that is about as satisfactory as one could wish for.

This wheel is one of the modifications of the turbine which are coming in such numbers from the busy brains of our inventors. It is represented in the annexed cuts, of which Fig. 1 is a vertical and Fig. 2 a horizontal section. A represents a cast iron case, which encloses the wheel and the parts pertaining thereto. This case is of scroll form, and is supported by standards, *a*, and a



SWAIN'S IMPROVED WATER WHEEL.



curb, B, which are cast with a bell-shaped base, B, as shown clearly in Fig. 1. In the top of the bell-shaped base, C, there is placed an iron block, D, which forms a step to receive a wooden block, E, that is fitted to the lower end of the hub, F, of the wheel, G. Transversely through the hub, F, and block, E, a bar, *b*, passes, said bar having screws, *c*, bearing on it, one near each end. These screws, *c*, pass up through the center or hub of the wheel, and by adjusting them the wheel may be raised or lowered, as desired.

The wheel, G, has its floats, *d*, cast of a single piece of metal. The face sides of the floats, *d*, where the water impinges are of paraboloidal form, whose axes are tangents to a circle to which the guides, *e*, are also tangents, as well as to the curve at or near the outer circumference of the wheel. The bottoms of the floats are formed by revolving the curves on their axes. Into the top of the case, A, a curb, H, is fitted. To the bottom of this curb there is attached an annular chamber, I, which may be termed a hydrostatic chamber. The bottom of this chamber is slotted to receive the guides, *e*. These guides are plates attached to or cast with a ring or cylinder, J. Three of the guides, *e*, are enlarged to allow rods, *f*, to pass through, and the upper parts of said rods have screws, *g*, formed on them, said screws passing through a flanch, *h*, at the inner side and bottom of curb, H. Each screw, *g*, has a nut, *h'*, on it, said nuts being pinions, into which a spur-wheel, I', gears; the wheel, I', being concentric with the shaft, K, of the wheel, and having a pinion, *a**, gearing into it, the pinion being a shaft, *b**, which is surmounted by a hand wheel.

The chamber, I, is made tight, with the exception of the slots, to receive the guides, *e*, the water entering and forming a complete stuffing box, by means of which adjustable tapering shutes are obtained, these shutes being formed by the bottom of chamber, I, guides, *e*, and top of cylinder, J. The ring or cylinder, J, encompasses the top of the lower curb, B, the lower part of the cylinder being provided with packing, *i*, which is secured to the bottom of the cylinder by a ring, *j*.

From the above description it will be seen that, by turning the shaft, *b**, the wheel, G, and pinions, H, will be turned simultaneously, and the guides, *e*, raised or lowered, as desired. These guides, in connection with the lower and upper surfaces of J J, form shutes which direct the water properly to the buckets, and by raising and lowering them, the volume of water admitted to the wheel may be increased or diminished at will, and the capacity of the wheel regulated as occasion may require. These adjustable shutes also form a gate by which the water may be entirely cut off from the wheel.

The floats, *d*, may occupy one-third the radius of the wheel, and have a depth of three-sixths of the same. The width of space occupied by the guides, *e*, may be the same as the floats. The sum of the shortest distance between the guides may be nine-fifths the diameter of the wheel. This, together with the number of the guides, determines the narrowest section of each guide, and also the angle at which the water strikes the float, and also determines, in a measure, the paraboloidal curves of the floats.

The inner and lower edge of the chamber, I, and upper edge of the ring or cylinder, J, are turned true, so that, when J is drawn up, it will make a complete water-tight joint, and keep all water from the wheel. When J is lowered the water strikes the floats with all the velocity and force due to its head directly under the rim of the wheel, which is so curved as to force the water down rapidly on the lower curved parts or bottoms of the floats, the water not leaving the wheel until its force has been properly expended on it. The water is discharged down between the curb and wheels and lower curb, H, and is turned outward by the base, C.

The particular angle which the guides, *e*, have in relation to each other is the same as that which the bottom of the chamber, I, and the top of the cylinder, J, bear to each other; to wit, about 13½° and not more

than 15°. Whatever the size of the wheel may be, no less than 24 guides and not more than 27 are used. The number of floats used will depend on the size of the wheel, but never less than 23 and not more than 4 inches apart for a wheel of any diameter.

The advantages claimed for this wheel are, 1st, The wheel has not a great weight of water bearing on it to wear the step away; 2d, The wheel may be readily raised without removing it from its proper working position; 3d, All parts are very accessible for repairs and removable at pleasure; 4th, It is very light, and may be started with little water.

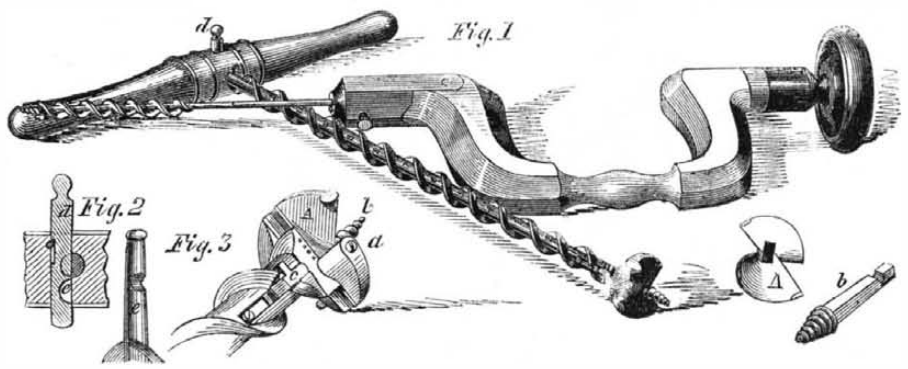
Further information in relation to this invention may be obtained by addressing the inventor, A. M. Swain, at Lowell, Mass.

IMPROVED COMBINATION AUGER.

Augers with adjustable cutters, by which holes of different sizes can be bored with a single tool, are no new invention, and the one here illustrated claims to be only an improvement on those heretofore in use.

The shaft is constructed of a solid cylinder, cast of malleable iron, and the flange that surrounds it is made sharp on its edge, as seen in Fig. 1, in order that it may cut in pieces any chips that, if left whole, might choke either the entrance of the auger or the escape of the chips. Said flange, as will be seen, runs the whole length of the shaft, so that it can be bored in the whole length if desired, without taking it out to clear it. The number or measure in inches is put upon the center column of the shaft, so that the user may know the exact depth of the hole without otherwise measuring it. The cutter, as represented in Fig. 3, is made round and flat, with two cutting edges which project below the body of the cutter, similar to the iron or cutting part of a plane, and having projecting spurs or lips similar to other augers. By this shape of cutter, all the chips are drawn out when the auger is withdrawn, so that, if it is necessary to bore deeper, there are no chips left at the bottom of the hole to hinder the feed screw and cutter taking hold readily. The cutter is held to the shaft, as seen in Fig. 3, by a dovetail tenon made upon the shaft, and a dovetail groove made into the cutter. It is made to extend or not. When not made to extend, the cutters are made with simply a square hole in the center for the end of the feed screw, *b*, to pass through; in which case a different sized cutter must be put on for each sized hole required. But when the cutter is made to extend, there is a set screw, *a*, that runs through one shoulder of the cutter, which screws against a shoulder made upon the shaft adjoining the dovetail tenon, and points are made into the shoulder for the point of the set screw to enter (see Fig. 3), so that it is held firmly wherever placed. Upon the opposite shoulder of the shaft (as will be seen in Fig. 1) is marked a guide or measure, and the other shoulder of the cutter runs against this shoulder as it is slid upon the dovetail, so that the cutter is readily set to cut any sized hole required. The hole in the cutter for the feed screw is elongated to allow the cutter to slide when the feed screw is in. When the cutter is in a central position with the auger, the tool bores the smallest hole within the limits of its capacity, and when moved the distance of one mark, it will cut—supposing the marks divided into 1-64 of an inch—a 1-32 of an inch larger hole, and so on to any desired size. Different sized cutters are put on, so that it is only necessary to have two augers or shafts and five cutters to bore from half an inch to a two-inch hole; and if each hole is 1-32 of an inch larger than the other, they will bore no less than 49 different sized holes. But if not made to extend, the same number of augers or shafts, with seven cutters, will be required, allowing the difference in the holes to be ¼ of an inch, the same as is usual with a set of common augers; making this a very cheap and convenient set of boring tools. The feed screw is made movable, not only to allow the taking off and putting on of the cutter; but different threaded screws can be put in to bore, if in very hard wood, very slow—if in soft wood, very fast. In common augers, if one cutting side or the feed screw breaks it is good for nothing, and must be replaced at the expense of a whole augur; but if such an accident should happen to this auger, a few pennies will purchase a new cutter or feed screw, and then it is as good as when new. The augers and cutters can be made to cut any size from ¼ of an inch to 12 inches, or if necessary, a six-feet hole; in fact, no round hole need hereafter be cut out with a chisel. A shipbuilder can bore for his anchor chains, his port or cannon holes, through the side of a vessel, or bore through the decks for the smoke pipe.

Fig. 2 represents an improved mode of fastening handles to augers, secured by a separate patent to the same inventor. The portion, *e*, of the shank which enters the handle is made round, and being turned, is of course in exact line with the rest of the auger. A semi-circular notch is cut in the side of this part of the shank to receive the pin, *d*, Figs. 1 and 2, and when the shank is passed into its place in the handle, this pin is pushed down so as to enter this notch and hold the shank from either turning or drawing out of the handle. In order to admit the shank without removing the pin entirely from its hole in the handle, a semi-circular notch is made in the side of the pin similar to the one in the shank of the auger, so that, when this pin is drawn back sufficiently to bring this notch opposite the hole in the handle, the way is clear for the admission or withdrawal of the auger shank. The pin is kept in place by making a short flat place on the side of it, as seen in Fig. 2, and a screw runs through the handle against this flat place in the pin, which prevents it from falling out, at the same time allowing the pin to be shoved in sufficiently to fasten, or if withdrawn, to release the auger.



HATHAWAY'S COMBINATION AUGER.

This mode of fastening is equally applicable to the fastening of bits in braces of all kinds; also drills in chucks for lathes, and all socket tools whatever. It is as applicable to ordinary square-shanked tools, as to those which are made round. It will readily be perceived that one handle is all that is necessary for a whole set of augers. By making augers with round shanks a great saving of time and trouble to the manufacturers will be effected. Besides the manifest advantages spoken of which this auger has, we will name another which is by no means a small one, and that is its portability. A carpenter having to go a long distance from home to do a job of work, which is very often the case, and not knowing the exact boring tool he will require, instead of loading himself down with the common augers and handles so as to be certain of having the right size, he can simply take his handle and auger shafts and, wrapping them up in a piece of paper, put them under his arm or into his overcoat pocket, if he wears one, and putting his cutters into his breeches pocket, he goes prepared to bore any sized hole he can possibly require.

The patent for this combination auger was granted Sept. 4, 1860, and the patent for the mode of securing the auger to the handle and bits into braces, &c., was granted Aug. 21, 1860.

Further information in relation to them may be obtained by calling on or addressing the inventor, J. M. Hathaway, No. 169 Center-street, corner of Canal, New York, second floor, corner room.

OILED silk is manufactured by coating it with some quick-drying boiled oil, and drying it in a warm room. Two or three successive coats are sometimes put on, each being perfectly dried in succession.

CUTTING PILES UNDER WATER—AN INGENIOUS APPARATUS.

To obviate the necessity of constructing a coffer dam in the Schuylkill, so as to build a pier for the Pennsylvania Railroad bridge, an ingenious contrivance has been put in operation to prepare the foundation of the pier. The water, at the spot where the pier is being constructed on the west side of the river, is about 17 feet deep, and after driving the piles, they have to be cut off level with the mud at the bottom. To do this, a long iron shaft is firmly secured to the uprights of the machine that drives the piles, and is driven by the steam engine ordinarily used for the pile-driver. This shaft, which is hollow, has secured to its extreme lower end a circular saw, 4 feet in diameter; the entire shaft being suspended by a rope passing over a pulley at the top of the uprights. Another rope, which passes around a drum, regulates the precise hight at which the shaft must be secured to saw the pile accurately at the length desired. The driving pulley on the shaft is made movable, so that at each change of the elevation, as required by the rise and fall of tide, its position is changed to suit the line of belting from the driving engine. The precise elevation of the shaft, and consequently the saw, is fixed for every pile by instrumental observation, taken from the shore with a spirit-level; and, with all the difficulties, it is surprising to witness the rapidity with which the work is done—some 60 piles being cut off on Saturday last. In one instance, by accident, the elevation of a pile head, after being cut, was found to be 1½ inches too high. The saw was again applied, and the 1½ inch neatly taken off in one slice, as was proved by the piece floating to the surface. Yesterday the whole number of the piles were cut off and made ready to receive the stones for the pier. The management of the scow on which the apparatus rests is under the superintendence of Mr. Vanhorn, and great care and skill are necessary to prevent accidents. By guy ropes anchored from different points of the scow—each with a man to attend to it—the position of the scow is regulated nicely, and, at the same time, works the feed for the revolving saw. This work of sawing piles is sometimes attended with great difficulty, and is only well adapted for rivers where the surface is not much disturbed, as a heavy wind, or even the passage of our river tug-boats, interferes with the operation, as the scow upon which the machine is erected should he held quietly in position during the process of sawing; otherwise, a fracture of the saw would result. Mr. Vanhorn has endeavored to counteract, to some extent, the effects of a light wind or slight undulation of the water surface, by attaching to the side of the pile-scow, two flat-boats heavily laden with stone; but still, when steamboats pass, the operation of sawing ceases. The whole work is well worth witnessing.—*Philadelphia Ledger.*

A NEW DISCOVERY IN EGYPT.—A Paris correspondent writes that a letter received there from Mons. Aug. Mariette, the eminent Egyptian antiquarian, states that a very important discovery has been made in Egypt:—"The excavations made at Memphis have brought to light a metal founder's workshop. We have already discovered his tools, about 40 pounds of unrefined silver, gold medals, 20 silver medals never seen before, and other objects destined to the crucible."

THE POLYTECHNIC ASSOCIATION.—The meetings of the Polytechnic Association, during the fair of the Institute, were suspended, chiefly for the reason that the president and several of the prominent members are occupied in their duties as managers. The fair closed on the 6th inst.

SOMETHING INTERESTING TO COME.—In our next number we shall commence the publication of Professor Faraday's six lectures, on the various forces of matter. They are exceedingly interesting and instructive, and will be fully illustrated by spirited engravings.

THE SEWING MACHINE—NO. III.

It is curious to follow out the effects of a change in the fashions of the fair sex on manufacturers. Douglas, the hoop-skirt manufacturer, states that two years ago about three-fourths of all the work on hoop-skirts was done on the sewing machine. But owing to the fact that steel hoops are now used instead of whalebone and cane and cord, &c., not more than one-fourth of the work is done on the machine. The steel hoops can be put in the skirt better by hand. But we predict that machinery will soon come to the aid of human labor in this branch also, for inventors are already contriving to introduce the steel hoop into the fabric at the time it is woven on the loom. We hope the ladies will not deprive our inventors of the chance of adding to their laurels in conquering this difficulty in the skirt manufacture, by any fatal change of fashion. When we consider that the skirt business of this city alone, in 1858, was about $3,000,000, we will be aided in estimating how desirable it must be to many operatives, and merchants, and capitalists that the present fashion be maintained.

The business of making shirts has grown to vast dimensions. One establishment in New Haven employs 400 Wheeler & Wilson machines and about 850 hands, 800 of whom are girls. The production is 800 dozen a week. The wages of the girls average $4 a week in this factory, which is about one dollar above the average of their wages at hand-sewing.

The bag manufacture is now carried on by machinery solely. Who can count the numbers in this branch, or the uses to which these bags are applied. The farmer, the grocer, the shipper, the housekeeper, use them in their operations.

It is calculated that the demand is barely satisfied with 120,000 machine-made bags a day—36,000,000 a year. The annual value of the business in New York and vicinity is $2,000,000.

The sewing machine was introduced into the cloak and mantilla manufacture in 1853. The ladies will be able to inform our readers whether or not these articles have been cheapened thereby, whether or not the patterns have been greatly beautified and improved in form and finish, and workmanship, and whether it would be possible for a hand-sewer at two shillings a day to furnish the stuff and do the work now done on them for any sum like the present prices. The elegant mantilla, which was once worn by the rich alone, now graces the form of the artizan's wife, and she wears it as becomingly as do the wealthy, for it is not any longer beyond her means. Moreover, the effect upon herself and upon her husband is good, for they are able to gratify that virtuous and natural desire of every right-minded and independent citizen to make a decent appearance before the public. The rich can do this without counting the cost, but those who labor are able to make the necessary provision only out of what remains over the rent and the price of daily bread, and if this remnant, so small and uncertain, will enable them to present themselves before the world in decent garb, the benefit *they* derive from this invention is large, for it secures to them their own self-respect, and stimulates their just pride and independence, and so promotes virtue and industry.

That these articles have been brought within the reach of the masses would be clear even without the evidence of our eyes, for the trade in this city in this line is $3,000,000 per annum. One of the dealers, Mr. Benson, states that the machines have created a demand for these goods that could not be supplied without them—that two-thirds of the work is still done by hand—that more hand-sewers are employed in it than before the machine was introduced—that the wages are increased—that the buyer pays less and gets more work—that the weakly girls are employed on the machines, and that their health is thereby improved.

Among those who gave testimony in the extension case which we have mentioned, was a needle-woman, who stated that she did not always at hand-sewing earn enough to feed her children. She used to earn at fine sewing about $2 a week, often beginning at 5 o'clock in the morning and working till past midnight. That she now works 10 hours a day on a machine, and makes $5 a week. The vast difference between the old and new system is illustrated by the fact that a dozen of ordinary shirt fronts, containing two plaits each, require 42 yards of stitching. The machine tosses them off in 30 minutes and less. We dare not guess how many hours the nimblest and prettiest fingers would require to accomplish this task; the testimony says twenty hours at least. *Who* is prepared to read that the trade of this city and vicinity in shirt fronts, is estimated at $10,000,000 of these useful articles.

Satchels and pocket-books of foreign manufacture are not any longer able to compete with the American article, since the latter have been turned out by this invention. The leather of which these are made is now manufactured here, owing to the demand caused by this turn in the trade. 500 dozen satchels are made every week in this city alone.

One of the most interesting allies of this invention is the "hemmer." We believe the country is indebted to Chapin for this improvement. It is proved that a sewing machine (Wheeler & Wilson's) fitted with one of these little magicians will do the work of 50 girls. There are many variations in it since Chapin's patent, but all are believed to be subsidiary to him, and to Blodgett and Boynton, who each invented a cording apparatus. With the aid of these toy-like implements, all the parasols and umbrellas, and other articles which require to be hemmed or corded are prepared by the machine, at a greatly reduced expense.

Such are a few of the items which suggest themselves to us in this unlaborced essay at a description of the sewing machine and its doings. Wherever sewing is to be done, there it is, or soon will be found, assisting with its tireless fingers. Who can deny that it has lessened the hardships of the poor. We had intended to use the data we had collected as the premises of an argument which should go to show that not only hand-sewers and other laborers, but the entire community had been benefited by this wonderful machine. But it seems idle to argue when contention herself has left the field. We utter only the general consent of civilized communities, when we demand for the art of machine sewing a place beside the most illustrious inventions of modern times, even now while it is in its infancy. It has decreased toil, made sickly employments to become healthy, increased the wages of labor, lessened the hours of confinement, increased the comforts of the laboring classes, cheapened every article it has touched with its Midas-like hand, opened new sources of national wealth, created new manufactures, enlarged many branches of trade, and notwithstanding all it has done in the past, the auspices are fair that its future triumphs will be more brilliant, and on a vaster scale.

[Concluded.]

UTILITY OF LIGHTNING RODS.

We have received a very able communication from a Philadelphia correspondent, on the subject of lightning rods, and partly in reply to previous letters from others. We regret that our limited space, and our duty to give all kinds of scientific news, prevent us from printing the entire communication. We make only the following extracts, bearing on the utility of lightning rods:—

We have first the testimony of a host of scientific men from Dr. Franklin's time to the present day, such as Faraday, Lardner, Harris, Hare, Henry, Bache, Maury, and others, the greatest electricians the world has produced. We next adduce the *facts* (which are "stubborn things"), or, I should say, a few of them; it is now a little over one hundred years (107) since Dr. Franklin's discovery of the lightning rod, or, rather, its invention, previous to which many church spires in Europe were *repeatedly* struck with lightning and severely damaged, one, St. Mark's, at Venice, as many as *nine* times; but since the application of rods to these spires—one hundred years ago—they have stood *unharmed!* Why do we not hear of church spires being destroyed now-a-days? there is just as much lightning as ever, and many more churches.

The next fact we offer is this: From 1799 to 1815—16 years—there were 150 vessels in the British navy struck by lightning, upwards of 70 men killed and 133 wounded. The loss (of material only) amounted to over one-half a million. In 1821, Sir W. Snow Harris, F.R.S., proposed a system of copper conductors, which were applied to the vessels of the navy; and *now* (after nearly 40 years' trial) it is found that losses and damage by lightning in the navy have *ceased* almost entirely, although the number of vessels has been increased very materially. But how is it on the land? Mr. E. Merriam, of Brooklyn, N. Y., says, "in 1859 there were 76 deaths and 41 injured by lightning. No death by lightning is reported, in the field of our research, in a building or vessel furnished with metallic conductors reared for the purpose of protection."

Within the past 15 years, over 800 deaths are reported, only one of which occurred in a building furnished with lightning rods. How do these results and observations compare with those of your correspondent? Do they not prove *conclusively* the usefulness and importance of lightning rods?

Messrs. Editors, I think it somewhat surprising that any intelligent person should, at the present day, attack the utility of lightning rods; they little think how much harm they may do, how great may be the loss of life and property, by promulgating erroneous views upon this subject. I hope that your readers, at least, will not be led astray by them. "A word to the wise is sufficient."

J. D. R.

THE CYANURET OF POTASSIUM ONCE MORE.

Messrs. Editors:—I saw mentioned, on page 206, Vol. III. of the Scientific American, that there was no known antidote for cyanuret of potass. The sesquioxyd of iron readily combines with the cyanuret, forming Prussian blue, which is comparatively harmless. A solution of proto-sulphate of iron, or the common sulphate, will also unite with the cyanuret, but not so perfectly. Electroplaters have informed me that green tea was also an antidote; I have never tried this, and do not know anything about it. Photographers generally use cyanuret of potass to remove silver stains from their hands, and it frequently causes bad sores. When experimenting, I have used these solutions of iron to wash my hands after using the cyanide, and found them successful. Chloride of zinc will also remove the silver stains, and is, I think, much safer. L. F. M.

Albion, N. Y., Oct. 10, 1860.

[The difficulty of administering an antidote for cyanide of potassium results from the instantaneous suddenness of its action. We knew a German photographer in this city who, one day meeting with some unexpected difficulty in cleaning a glass plate, became suddenly transported with passion, and, in his madness, dashed the plate to the floor, and seizing a vessel of cyanide of potassium, poured it down his throat. He dropped as if he was shot, and died in half a minute. The best way for persons to manage who have occasion to use this swift and deadly poison is to keep it out of the reach of children.—Eds.

Diptheria and its Cure.—This singular disease which has thus far seemed to baffle the skill of our best physicians, has become so prevalent and has been so generally fatal, that any suggestion in regard to its cure will hardly prove uninteresting. Its causes are not known, and therefore all treatment has heretofore been merely experimental; but its pathognomonic symptoms are so diversified and dissimilar, that in many instances the throat of the patient closes, and he dies before his disease has been discovered. The diagnostic by which it is known from other complaints of the throat is the formation of a membrane which increases gradually until the patient is literally strangled to death. It is sometimes accompanied by ulceration, and extreme prostration of the entire system, and at others by neither of these symptoms, yet in either case it is equally fatal. To arrest the formation of this membrane would therefore seem equivalent to curing the disease, and this in most instances may be done in the following manner:—In the early stages of the complaint, which is always accompanied by a soreness and swelling of the throat, let the patient use a simple solution of salt and water as a gargle every fifteen minutes. At the same time moisten a piece of flannel with a solution of the same kind, made warm as the patient can bear it, and bind it around his throat, renewing it as often as the gargle is administered, and in the meanwhile sprinkling fine salt between the flannel and the neck. Use inwardly some tonic or stimulant, either separately, or if the prostration be great, use both together. The treatment, as may be seen, is extremely simple, and, if used in the earlier stages of the disease, will effect a complete cure.—*Cincinnati Daily Press.*

TALK WITH THE BOYS.

No. 6.—Carbonic Acid in the Leaf—The Philosophy of Burning Charcoal—The Way Plants Draw their Solid Substance from the Air.

"What were we going to talk about to-day, boys?"

"You were going to tell us, sir, how carbonic acid gets into the leaves of trees and plants, and what becomes of it there."

"Oh, yes! And of all the operations of this wonderful substance there is none more interesting than this, and none which has been the subject of more delicate and rational investigations. When carbonic acid, floating along in the atmosphere, comes in contact with a growing leaf, it is absorbed by the leaf and decomposed; that is, in each of its atoms the oxygen is separated from the carbon, the former escaping into the air, while the carbon is carried by the sap to all those parts of the plant in which new wood is being formed, and is deposited in the proper places to perform its part in building up the structure of the plant. If you take a piece of wood and heat it in a close oven, or under a covering of turf, so as to keep the oxygen of the air away from it, and thus prevent the carbon from burning, the more volatile constituents of the wood will be driven off in the form of gases and the carbon will be left. Charcoal is almost pure carbon, and if you examine a piece of charcoal you will see the form in which carbon is deposited by the sap in the structure of the tree."

"But, father, how do they know this?"

"A very proper question, and one to be asked in relation to all assertions. It would, however, require volumes to give a full account of all the experiments and observations which have been made in the investigation of vegetable physiology. One of the simplest observations is made by bending a branch of a growing plant under the edge of an inverted jar filled with water, and exposing the jar to the action of light. Little bubbles are seen to collect on the surface of the leaves and float up through the water, in time filling the top of the jar with gas. On examining this gas it is found to be pure oxygen, and if the water contains carbonic acid, or if carbonic acid be put into the jar, just enough of this to yield, the oxygen produced is always found to disappear. If there is no carbonic acid in the jar, no oxygen will come from the leaves. These experiments have been made in the most thorough and careful manner by different men, and not only has the general law been fully established, but the slight modifications of it have been noted and fully discussed. For instance, it is found that, under certain circumstances, the oxygen given off by the leaf is not quite equal to the amount contained in the carbonic acid absorbed, from which it is inferred that the oxygen resulting from the decomposition of the carbonic acid is not always all given off, but that sometimes a portion of it is appropriated to the growth of the plant. On the other hand, if the roots are placed in substances full of oxygen a portion will be absorbed by them, and the leaves will give off a little more oxygen than is contained in the carbonic acid absorbed."

"What did you say about setting the plant in the light?"

"It is found that this decomposition of carbonic acid only goes on when the plant is exposed to the action of light. During the night the process is reversed; the plant absorbs oxy en and gives off carbonic acid. The quantity of carbonic acid given off in the night, however, is not nearly equal to that absorbed during the day. If plants are wholly excluded from the light they will grow for a while; but, having no carbon, which is one of the elements necessary to a perfect plant, they will present a pale and sickly appearance, as you have doubtless observed in the case of potatoes growing in a dark cellar."

"Is all the carbon in plants absorbed from the air by the leaves?"

"That question has given rise to several long series of very laborious experiments. It is found that a portion is absorbed by the roots, and that the relative proportion taken in by the roots and by the leaves varies with circumstances, and with the different kinds of plants. Boussingault found that the Jerusalem artichoke obtained the largest proportion of its carbon from the air, of any plant that he tried. Some plants, under certain circumstances, obtain nine-tenths of their carbon from the air, but two-thirds is probably not very far from the average."

"What was that you said last week about shears?"

"Oh! I said that we would discover the two blades of the shears that cut the atoms of oxygen and carbon, which form carbonic acid, asunder. One of the blades is light, the other is the force of vegetable life."

"How do they divide the atom of carbon from the two atoms of oxygen?"

"That is a question which any boy can ask, but which no man can answer. Notwithstanding all that we know about chemical affinity, and how its power varies over the several substances which we meet with, what is its essential nature—how it gets hold of one atom and draws it to another—is an absolute mystery. In every department of inquiry, a few steps bring us to the boundaries of knowledge. There is one singular thing about this action of plants on carbonic acid—the petals of the flowers exhale this gas both day and night."

"Do you say the carbon is carried down from the leaf by the sap?"

"Yes; the course of the sap has been carefully observed. It enters the roots, passes up through the pores of the wood, and after being spread through the leaf, returns again through the pores of the bark, depositing as it goes down, the materials by which the growth of the plant is carried forward between the wood and the bark. The sap is thickened in the leaf by the evaporation of its watery portion. A large tree draws up from the earth and gives off into the air an enormous amount of water. You now have a general idea of the way plants grow; and next week I will take you away back into the depths of time, and show you how carbonic acid was being decomposed and its carbon packed away in the hills long ages before man was created, where it could be preserved for the use of this steam engine generation. This will bring us back to illuminating gas, where we first started, and will complete the history of the great circle through which carbonic acid passes in the operations of nature.

SHARPENING SAWS.

Messrs. Editors:—Allow me to give a word of advice to lumber sawyers. After years of trial, labor and experiment, I have lately learned a "better method" of keeping a saw in order. Instead ot leaving the throat at the roots of the teeth almost a point, cut out the throat or foot of the space between the teeth nearly as wide as the base of the teeth; thus leaving more room for the sawdust, and reducing the labor of filing. And to sharpen the teeth, hold a smooth-faced iron or steel under them, and, with a light hammer, flatten down aad draw out the tooth; thus keeping the underside alway's level, the corners out full, the edges thin, and the temper good, finishing with a file, and being careful to give the "set" as near the end of the teeth as possible. E. Wilbur.

Albion, N. Y., Oct. 11, 1860.

STEAM FIRE-ENGINE TRIAL.

Messrs. Editors:—The statement, in your last paper, in the report of the steam fire-engine trials, that "it will be seen that, thus far, the plunger party have the best of it," should read *as to quantity*, the report, in other respects being correct. Your Reporter.

Supply of Cotton.—We understand that a meeting is to be held in Manchester, next week, for the purpose of discussing the propriety of forming a joint-stock company, the chief object of which will be to buy cotton in India of an improved quality, and ship it to this country. It will be recommended that a model farm be established in the East Indies for the cultivation of superior cotton for coarse spinning; and another model farm in Australia, where all the cotton of the Brazil, Egyptian, and Sea Island qualities can be produced. The importance of obtaining a plentiful supply of cotton for the manufactures of this country, from as many sources of cultivation as possible, all reasoning and prudent men of business acknowledge. A serious dearth of cotton would be to the manufacturing districts as distressing and ruinous as a famine of bread, for capital and labor would become unproductive, and insolvency and fearful personal suffering would be the result.—*London Engineer*.

A COLUMN OF VARIETIES.

Paris was astonished not long since, as it often is, by the sight of a carriage propelled by neither steam nor gas, going with such amazing swiftness as to leave far behind the four-in-hand carriages of the Jockey Club, which endeavored in vain to keep up with it. The inventor is said to be a poor man, who has constructed the vehicle entirely himself, and will not disclose the secret till he is properly secured by patents.

It is an old saying that lightning never strikes in the same place, but it has not been verified in the case of the Hollis-street church, Boston. Twenty-three years ago last Spring, the steeple of the church was struck twice within a month. The first time the electric fluid set the steeple on fire, and the vane fell over into an adjoining yard. On the second occasion the damage was slight, but the fact of its having been struck twice within so short a period, caused considerable excitement at the time. The steeple has recently again been struck by the electric fluid.

The silk culture is to be added to the industrial pursuits of California. It is ascertained that the climate is warmer and more applicable to the culture of the silk worm than that of France, where they succeed admirably, and that the silk worm of Japan will stand the best chance in that climate.

Captain Ericisson's admirable invention for setting in motion sewing machines, without the aid of a treadle, is meeting with much favor. Compressed air furnishes the power used. A large receiver is placed in the operator's room, into which is forced the air, afterwards conveyed to each machine through tubes. The sewing girls are thus relieved of the fatiguing task of working the treadle, and have nothing to do but to regulate the movement.

We learn by the Pittsburgh *Chronicle* that late intelligence from the oil districts reveals the fact that the celebrated Tideout well stopped flowing over the top after throwing out some two hundred barrels. The famous Crosby well has dwindled down from seventy barrels a day to six or seven, but the owner thinks the failure is attributable to the filling of the pump, and hopes to do better when it is cleaned. Out of two hundred and sixty-seven wells on the creek, above Titusville, only thirty-four are yet pumping oil, and many of the oil-seekers are just now in a state of very anxious suspense.

Some experiments have been made with wind wagons in Kansas during the past summer. One of these contrivances took a party from the Missouri river to Pike's Peak in twenty days. Another of these wagons started from Oskaloosa, two or three weeks since, and went on finely for a day or two till it was overtaken by a gale which drove it on at the rate of forty miles an hour until it tumbled into a ravine, smashing the vehicle into fragments and terribly bruising the travelers.

The California papers report that some of the pear trees in that State, of the Bartlett variety, bear two distinct crops of fruit this year. The trees blossomed in April and July. The pears of the first crop, at the 1st of September, were large, weighing eight or nine ounces each; the second crop then weighed about two ounces. It would astonish the fruit-growers of the Atlantic States to find two he lthy crops growing on one tree, both holding fair to mature into the most delicious fruit.

There are estimated to be 9,000 locomotives in use in the United States, their total mileage being about 175,000,000 miles. The average cost of fuel at ten cents a mile (the average in the State of New York is 18 cents) would be $17,500,000. A saving of only two cents a mile in fuel would reduce this sum $3,500,000. Nearly sixty locomotives are on order at the works of a single firm in Philadelphia.

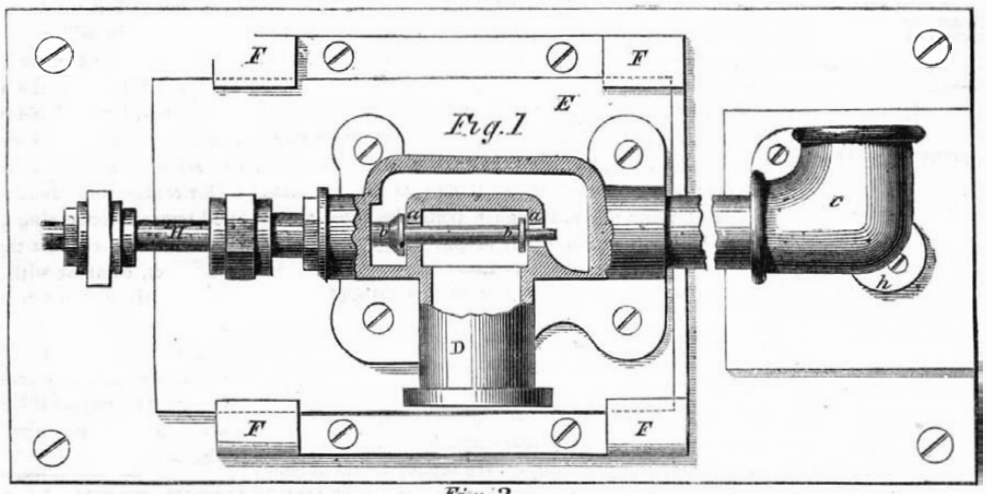
One of our correspondents informs us that a new sleeping car was placed on one division of the Grand Trunk Railroad, and has made a daily trip between Montreal and Toronto (a distance of 333 miles) for twelve months, having performed 314 journeys of 333 miles each, equal to 104,562 miles, without loss of time or accident. The car is still in first-rate running order? Can this be beat?

Among the most curious *on dits* is one relative to the intention of the Beaufort family to open the coffin of the first Earl of Worcester, as it is said that he ordered the model of a steam engine he invented to be buried with him.

IMPROVED STEAM TRAP.

Since our people are determined to heat their rooms with furnaces, stoves, heaters or hot iron in some form, instead of the good old-fashioned glowing grate or crackling wood fire, with its cheerful blaze and exhilirating warmth, perhaps there is not one of these death-dealing devices less injurious than steam pipes. Indeed, there are many circumstances, such as large shops, counting rooms, &c., in which these pipes are the best of all modes of heating; at all events, from their economy and convenience, they are coming into very extensive use, and the perfection in their arrangements is being seized upon as affording a fine field for profitable invention. The radiation of heat from the surface causes a condensation of water in the portions of the pipes which are at a distance from the boiler, and unless the water resulting from this condensation were removed, it would fill the pipe and stop the circulation of the steam. Several plans have been devised for removing this water automatically, the apparatus being called a steam trap.

The annexed cuts represent a steam trap which is not a modification of any old plan, but an entirely original and novel invention. It consists of a long pipe, with one end fixed, and the other free to move back and forth with the expansions and contractions of the metal resulting from changes of temperature, a stationary valve stem working through the free end of the pipe, so arranged as to close the valve when the pipe is heated by being filled with steam, and to open it when the pipe is sufficiently cool to condense it into water.



UPHAM'S IMPROVED STEAM TRAP.

The stationary end, C′, Figs. 1 and 2, of the long pipe is rigidly secured to the ceiling or wall of the room, while the board, E, which supports the free end, is suspended by hangers, F F F F, in a horizontal position, so that it may slide back and forth. The valve stem, H, is fastened at its outer end to a hanger depending from the ceiling, while its opposite end passes through a stuffing box into the free end of the pipe and carries the valves, *b b*. The enlargement, C, upon the long pipe serves as a valve chamber, and the water of condensation passes out through the waste pipe, D. It will be seen that, when the pipe is expanded by being filled with steam, the valve seats, *a a*, will be carried forward against the stationary valves, *b b*, and the escape of steam prevented, but when the pipe is sufficiently cooled to condense the steam into water, it will be shortened by this reduction of its temperature, and the valve seats will be drawn away from the valve allowing the water to flow out.

The patent for this novel invention was procured, through the Scientific American Patent Agency, on August 28, 1860, and further information in relation to it may be obtained by addressing the inventor, Nehemiah Upham, at Norwich, Conn.

A NEW ELECTRIC LIGHT.

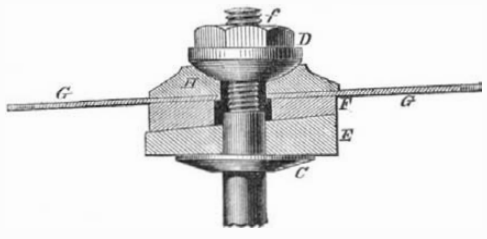
Professor Way, of London, has recently invented an electric light which appears to have more of the elements of practicability than any heretofore proposed. The light is steady, constant, agreeable to the eye, may be exhibited under water as well as in the air, and there is no consumption or derangement of material except of that which is a part of the battery. Moreover, the electricity may be generated by the magneto-electric machine, and possibly by the ordinary friction machine, so that the cost of the light may be determined simply by the cost of mechanical power. In short, it appears as if we may some day employ our steam engines, in the manufacture of light, with as much certainty and profit as in the manufacture of cloth or iron.

This new light is produced by simply sending a current of electricity through a stream of mercury, falling vertically. As the mercury falls, it breaks up into an infinity of small globules, between which bright sparks constantly pass, and these sparks are so small and so close together that the light appears solid and homogeneous. Also, when a battery of quantity is employed, the mercury is greatly heated and vaporized; and it is said that in this way the light is further increased. In the working apparatus there are two reservoirs of mercury, one above the other; and when nearly all the mercury has descended, it is forced up again, or the apparatus is turned over, so that the lower reservoir shall become the upper. These reservoirs with the mercury are hermetically sealed in a glass vase or globe, so that no mercury is lost, and its poisonous fumes cannot get into the air.

We understand that some gentleman in this city are repeating and modifying Professor Way's experiments, and if anything useful should be developed, our readers will be informed at the earliest moment.

IMPROVED GROOVING SAW.

All owners of shops in which circular saws are used will probably find it to their interest to procure the nut and washers here illustrated, for adjusting the saw at any desired angle with the mandrel, for the purpose of cutting grooves in boards or timber of any desired width.



They were invented by Amos D. Hughfield, and have been extensively used in the city of Philadelphia, where they have given universal satisfaction; being recommended in the very highest terms by the leading workers in wood in that city.

Two beveled washers, E and F (Fig. 1), are fitted loosely on the spindle, resting against the collar, C. Upon the opposite side of the saw, G, is the plain washer, H, having a concave recess in its outer side, into which fits the convex surface of the nut, D. The saw is adjusted to the desired angle with the spindle by turning the washer, F, upon the washer, E, and the washer, H, is sufficiently loose upon the spindle to follow the saw, adjusting its inner surface to the outer surface of the saw when the nut, D, is screwed home, securing the several parts in their places. The washer, F, is graduated on its periphery, and the washer, E, has a notch to serve as an index, so that the saw may be accurately adjusted to cut a groove of any desired width.

A striking evidence of the accuracy required in machinery running at high velocity is furnished in the necessity—discovered by experiment—of balancing the weight of the beveled washers upon opposite sides of the axle. This balancing is effected by simply drilling holes through the washers on the thicker side, so as to remove the proper portion of the material.

The patent for this invention is now owned by William H. Harrison, who may be addressed, either for the washers or for any further information in relation to the matter, at No. 705 Jayne-street, Philadelphia.

COLORED LIQUIDS.

The gradual decoloration of colored alcohol in thermometers, by the influence of light and the precipitation consequent on the chemical change produced, is doubtless of importance to the druggist, anxious for the showy appearance of his windows. The following remarks will therefore be read with interest and benefit:—Solutions of various salts or metals in hydrochloric acid are, some of them, of very great intensity and beauty. Thus, a yellow liquid is obtained by dissolving 3 parts of perchloride of iron, or hydrated peroxyd, in 100 of hydrochloric acid: the color may be heightened by adding some some hydrated oxyd. Various colors are produced with the solution of protocarbonate of cobalt in hydrochloric acid. The salt of cobalt used must be chemically pure, especially free from iron or nickel, which would prevent or neutralize the formation of the blue and red shade. The green cobalt color is obtained by dissolving 3 parts of the protocarbonate in 100 parts of the acid, and filtering. By the addition of a few drops of the above yellow liquid the color is deepened, and loses the bluish tinge. A blue color is prepared by dissolving 6 parts of the protocarbonate of cobalt in 100 parts of the acid, and boiling for about two minutes to remove the carbonic acid or chlorine held in solution. Neither of the above two colors should be diluted with water, as this would change them to red. The violet color is obtained by dissolving 34 parts of the protocarbonate of cobalt in 100 parts of the acid, mixed with 5 of water, and boiling up before filtering. A very fine red liquid is obtained by dissolving 45 parts of the protocarbonate of cobalt in 100 parts of acid, diluting with 45 parts of water, and boiling. All the cobalt colors change by heating the solutions, which gives them more or less a blue tinge; but, on cooling, this gives way to the color intended. The solution of carbonate of chromium in hydrochloric acid (chloride of chromium), evaporated until it becomes hard on cooling, and dissolved in alcohol (90 p. c.) in the proportion of 25 parts of the salt and 100 of the spirit (to which are added 5 parts of acid), furnishes a fine deep green. Four parts of crystalised acetate of copper, dissolved in a mixture of 50 parts of aqua ammoniæ and 50 of 90 p. c. alcohol, give a durable blue.

A Belgian named Stipheen, of Ghent, has made a discovery which may be of some utility; it is, that the rusting of nails employed to fasten the branches of fruit trees to walls can be prevented by knocking into the wall at the same time as the nail a small piece of zinc. In giving an account of his discovery to the Agricultural Society, of Ghent, M. Stipheen produced nails which had been eight years in walls in contact with a piece of zinc, and which were not at all rusty.

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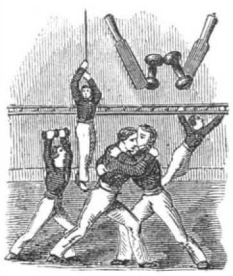
VOL. III., No. 16....[NEW SERIES.]....*Sixteenth Year.*

NEW YORK, SATURDAY, OCTOBER 13, 1860.

PHYSICAL TRAINING IN COMMON SCHOOLS.



E see that the Superintendent of the Boston schools recommends the general adoption of gymnastic exercises as a regular part of school training. It seems to us that there is no movement of the day of greater importance to the scholars individually, or which is destined to have a greater influence upon the well-being of the country, than this of systematic physical training of children. For *success in life*, vigorous health is of far greater importance than high intellectual culture. *Energy* is what rules the world. Take two boys, equal in every respect, box one of them up in school from morning till night and from year to year, cultivating his mind at the expense of his body, till his nerves have outgrown his muscles, and his brain has outgrown his stomach; while the other boy receives a fair but equal development of both mind and body—and what is the result in the two cases? The scholar graduates perhaps with the highest honors, but he leaves college a feeble and complaining invalid; intellectual and refined, he shrinks with nervous sensitiveness from the rude shocks of the battle of life. The result is, that he is thrust aside in a corner, or trampled under foot in the race. On the other hand, the man who comes forth upon his career in possession of a vigorous constitution, has the backbone, the nerve, the energy, that enable him to win the great battle that every human life is. His days are filled with healthful and happy activity; his slumbers are sweet at night; his cheerfulness (the natural effect of good digestion) makes his presence a pleasure to all who know him; he becomes the father of healthy offspring, and fills his home with merry voices; in short, fulfills all the purposes of his being, and leads a prosperous, happy, useful and successful life.

But we have conceded too much in yielding the palm of intellectual superiority to the scholar whose brain is overstuffed. John Whipple once asked Daniel Webster to what he attributed his marvelous power of mastering complicated and difficult questions; Webster replied that he attributed it to his habit of never using his brain when it was in the least degree fatigued. The great fact that the time during which the human brain can continue its action is limited, is one of the utmost importance, but it seems to have been generally ignored by those who have had the management of our schools. A New York school commissioner, with leather lungs and a cast iron head, may insist that a child who has been boxed up six hours in school shall spend the next four hours in study, but it is impossible to develope the child's intellect in this way. The laws of nature are inexorable. By dint of great and painful labor, the child may succeed in repeating a lot of words, like a parrot, but, with the power of its brain all exhausted, it is out of the question for it to really master and comprehend its lessons. The effect of the system is to enfeeble the intellect even more than the body. We never see a little girl staggering home under a load of books, or knitting her brow over them at seven or eight o'clock in the evening, without wondering that our citizens do not arm themselves at once with carving knives, pokers, clubs, paving stones or any weapons at hand, and chase out the managers of our common schools, as they would wild beasts, that were devouring their children. Indeed, they are worse than wild beasts, for those destroy only the body, but these fiends consume both body and mind of the helpless innocents who fall into their clutches.

In Boston, the system of studying out of school has been prohibited in relation to the girls, and we should be rejoiced to see this city take the lead in extending this prohibition to all the scholars. We are very glad to see that the time for gymnastic exercises is to be taken from the study hours, and not from those given to play—"Experience having shown," says the Superintendent, "that the scholars learn more when a portion of the time is given to these exercises than when all is devoted to study."

We hail the introduction of physical training into our common schools as being calculated to make the Americans the finest race of men, physically, that the world has ever seen; but we value it more as an important step in carrying to a still higher point the unparalleled intellectual cultivation of our people.

DECOMPOSITION OF STEAM—AN OBSTINATE CRITIC.

Our friend, *The Engineer*, appears to be a stubborn pupil. We made the plain and concise statement that a white hot block of iron weighing 100 pounds, in the presence of steam, would take up 30 pounds of oxygen, and be wholly converted into oxyd of iron. The *Engineer* coutradicted us flatly. We replied to our cotemporary in a friendly and conciliatory spirit, and hinted that if he would bear in mind the porous nature of a film of oxyd of iron, he would be able to take in the truth of our statement. We really hoped the difference between us was happily settled, and that our friend had added an interesting fact to his stock of chemical knowledge. But his issue of the 27th ult. is still perverse, contradicts again, and quotes the professors against us. He says:—"Professor Faraday's authority is against the SCIENTIFIC AMERICAN, and so is that of most chemists of eminence." This very strong expression discloses the fact that instead of pondering on our good-natured hint, he rushes to his library to find what chemists of eminence have said, and in his zeal to confront us forgets the real point at issue.

The *Engineer*, if he is really desirous of becoming posted on such subjects as the oxydation of iron, will do well to take a start from some fundamental and elementary stand point, and thus reach his conclusion by a slow but sure step by step. We furnish a few facts for his careful contemplation. Iron is very easily oxydized in the presence of vapor of water at the ordinary temperatures; it is covered with a film of rust, which thickens in proportion to the exposure, until all the iron may be converted into rust. We commend to our friend the philosophy he may extract from a rusty nail; without searching far, he will find a nail that has been entirely oxydized, so that he can pulverize it in his fingers; when found, let him make a note of it. A few years ago, the newspapers reported that the ax with which Noah hewed out his ark had been found, out West, in the body of a tree into which he had struck it when his work was done. This story, although incredible, was founded on the well attested fact that a mass of iron rust in the form of an ax had been found in a tree, and there can be no doubt that the mass of rust proceeded from a solid iron ax. Now, all these cases of rusting depend upon the decomposition of water. Our perverse friend here might tell us that water is not steam, and that cold iron is not white hot iron; and we are obliged to call his attention to the fundamental fact that chemical reactions of this nature are favored by a high temperature, from which he will possibly conclude that the nail and the ax would have been changed to rust in an immeasurably shorter time had they been white hot.

And as to "most chemists of eminence," they will tell the *Engineer* that steam is very rapidly decomposed in passing over white hot iron, and that the iron, in the shape of turnings, wire, nails, &c., is, in the process, wholly converted into oxyd. In the actual manufacture, it is desirable that the iron be pretty finely divided, for the reason that more surface is offered to the steam, and that the film of oxyd shall not become so thick as to materially retard the contact of the steam. Will not the *Engineer* observe that our 100-pound block of iron is the iron turning, or the bit of wire on a larger scale? Surely he will not tell us that, although the oxyd is porous on the wire, it will be impermeable on the 100-pound block; we shall wholly abandon him as a hopeless case, if he be so inconsistent.

Finally, if, in all the light we have thus above furnished, the *Engineer* is unable to see that we have told only the truth, we recommend him to apply the *experimentum crucis*, get a 100-pound of iron, heat it white hot and pass steam over it, and continue the white heat and the passing steam. If the *Engineer* will be faithful to the experiment, we guarantee the result will be as we have stated. But we warn our friend that he must have patience, for he will not burn up his iron in an hour or a day. Let him prepare himself for a labor, say of six months, for towards the end the operation will go on very slowly, for the little mass of iron in the center will be enveloped in a thick covering of rust, which will act like ashes on a charcoal fire.

Our readers will understand, of course, that the original remark concerning the 100-pound block was simply to illustrate the fact that white hot iron will decompose steam, combine with oxygen, and be increased in weight in the proportion we stated. That this process will be obstructed as the thickness of the film of oxyd increases is manifest, but that it will be entirely stopped, the *Engineer* and any array of professors will not convince us. We respect the professors highly, but we make it a rule not to trust them when they wander from the truth.

A WONDERFUL BILLIARD PLAYER—MONS. BERGER, THE FRENCH CHAMPION IN AMERICA.

A few evenings ago, by the invitation of Michael Phelan, the champion billiard player of New York, we had the pleasure, with a large number of other city editors, of witnessing the wonderful skill exhibited by M. Berger, in the dexterous use of the cue, making the balls obey his will as if by magic. Mons. Berger has brought from Paris his own table, which is quite a novelty by the side of a first-class American table. The French table is not much more than half as large as the American one, is built very heavy, and without pockets.

The following are some of the most wonderful exploits by Mons. Berger, whose weight, we should judge, could not be less than 300 lbs. His most astonishing performance consists in holding the cue perpendicular over the ball and striking it with such skill as to cause it to twist to any desired part of the table, to jump, carom and perform all kinds of fantastic freaks, quite marvelous to the beholder. The following are some of the most surprising shots we witnessed:—

Placing a ball in a hat, and making a carom by causing a ball to jump into the hat.

Making a carom by causing a ball to travel a portion of the distance on the cushion.

Making *massé* shots from various portions of the table, causing the player's ball to twist to any point previously marked.

Jumping the player's ball over a cue held over the table horizontally, and causing it to draw back, caroming on a ball under the cue.

Jumping the player's ball from the table into a gentleman's hat.

Admirers of the game of billiards will find Mons. Berger at the extensive rooms of Mr. Phelan, corner of Broadway and Tenth-street, where he proposes to give a series of artistic entertainments in this art.

THE TRUTH OF SPIRITUALISM DEMONSTRATED.

A short time since, Mr. Campbell, a photographer in this city, while engaged in some experiments, after cleaning a glass in the usual manner and covering it with the collodion film, took the picture of a chair standing in the room. On developing the picture, the image of the chair was seen perfectly portrayed, but, miraculous to relate, portrayed with equal distinctness, a boy was seen sitting in the chair! An account of the circumstance, headed "The Photograph of a Ghost," was published in the *American Journal of Photography*, with a technical explanation, perfectly clear to photographers, but not so intelligible to ordinary people. At a recent meeting of the Spiritualists in the upper part of the city, the occurrence was described and excited a great deal of interest, as affording the most direct and tangible proof that the departed do revisit the earth in bodily form. The office of the *Journal* was visited to

learn the particulars, and the question was asked, in triumphant tones, whether science would attempt to explain away this evidence, also, as it has all the other evidence of that which it ignorantly and presumptuously calls the stupendous delusion of spiritualism.

We suppose we hardly need to inform our readers that the miracle is no more a miracle than is the taking of any photographic picture, or than any of the mysterious and wonderful operations of nature. The glass had been previously used to take a picture of the same chair with the boy sitting in it, and had been so imperfectly cleaned that, in the developing process, the old picture came out with surprising distinctness.

OUR SPECIAL CORRESPONDENCE.

THE UNITED STATES AGRICULTURAL SOCIETY'S FAIR.

CINCINNATI, Ohio, Sept. 18, 1860.

Generally speaking, the managers of great agricultural fairs, forget the ordinary wants and necessities of their visitors, and thus too frequently create discontent. People, I imagine, are no less thirsty on a fair ground than elsewhere, and no less tired and hungry; they do not forget weariness of limb, however attractive may be the show around them; and they need, especially ladies do, certain opportunities for rest and privacy, quite as much, and even more, than when about their usual avocations. Absorbed in the grand end and aim of their annual display, managers forget that in proportion as they make the public physically comfortable, they will incur blessings or maledictions. I have been to a great many fairs first and last, but do not recollect one where the same liberal provisions were made to quench the thirst of the multitude, as we find at this national show; and it certainly reflects great credit upon Mr. Fee, Secretary Poore, and Professor Cary, that no improvement in this respect can be suggested. To supply the water necessary for feeding the boilers and for the use of stock, eight wells were sunk, in various parts of the grounds, and thus a superabundant supply of excellent water was obtained. That all visitors might have an opportunity to quench their thirst, pipes were laid from suitable tanks at the diffierent wells, and these being attached to frames at proper hights from the ground, and pierced for numerous faucets from each of which a tin cup dangled by a string, some two hundred persons could refresh themselves at once. True this plan militates somewhat against the sale of spiritous liquors, but many a hundred thirsty soul has been the gainer by it.

I do not know that there is one thing on these grounds which is more worthy of the friendly aid of the SCIENTIFIC AMERICAN, than W. R. Fee's cotton seed oil machinery, to which I made a very brief reference in a previous letter. When an apparatus is invented which enables us to utilize some substance otherwise wasted, it takes a rank as a national blessing. When we see how many hundred tuns of cotton seed are thrown into the muddy waters of the Mississippi, the Arkansas and the Red river, merely to rid the planters of the nuisance of their accumulated heaps; and how many thousands more are almost wasted by application as manure to the soil of some of the seaboard States; it seems as if Fee, or any other ingenious man who makes from the seed the finest lubricating oil, and the most nutritious food for stock, becomes a benefactor to the South. The analyses of English and German chemists, as well as the more practical results of actual experiment, have established the rare virtues of both cotton seed oil and cake; and it only needs that enough of the cake should be supplied as required to drive linseed cake actually from the English market. Fee's apparatus is exceedingly simple, but on this account none the less valuable. His huller consists of a grooved cylinder, which being revolved, rapidly strips the hulls from the meats by shaving the seed between the raised edges of the grooves and a semi-circle of iron, grooved like the cylinder. The meats are merely put into bags and pressed by hydraulic power until the oil is all expressed, and a dry cake is left. There are screens and shakers under the huller, which separate hulls from meats, and sort the whole meats from the fragments. The whole meats are shipped direct to England, where they are pressed, while the fragments (which might not pay for transportation) are pressed at home. There are two sizes of apparatus made; one for wholesale operations, and the other for the planter.

It is a curious and instructive study to watch the annual contributions to the department of self-raking harvesters. It seems strange that there should have been devised so many contrivances for doing a very simple thing, and that so many should be hopelessly complicated in their construction. The great object of this invention is to save the labor of one man in removing the grain as fast as cut, as well as to enable the work to be done more speedily. Landed proprietors in England have told me that a good self-raking reaper must be invented before they will be independent of the whims and obstinacy of their ignorant farm-servants; and that, until we are prepared to send them something better than the Burgess & Key machine, we may as well keep our reapers at home. And yet, look how foolishly American inventors rush into the transatlantic speculation! Without knowing the wants of the British farmer, so different from our own, they send harvesters over there which are perfectly worthless for foreign service, however excellent they may be at home. English grain grows, on an average, 5½ to 6 feet high, and very thick at the bottom. The moist climate makes the stalk at maturity much heavier than our own, and, from a desire to save every possible inch of straw, they cut the grain as near the ground as we do grass. Now, it must be evident that our short platforms and high-set machines fare very badly in an ordinary English crop; while the long, heavy gavels make the labor of hand-raking severe in the extreme. These facts, which I know from practical experience and observation, make me the more interested in the department of self-raking reapers at this and other shows, for if the right thing is once invented, and can be furnished at a fair cost, the patent would be a pretty valuable one. What a host of self-rakers have we not here! Wood, Wilson, Atkins, Dutton, Haines, Manny, Seymour & Morgan, and a dozen others, show what they have been able to dig out of their cudgelled brains, and how many of the lot are worth the price of old iron? Some of them, doubtless, are good; but which is just the thing we need, I cannot undertake to say, for I have not seen them all at work. Before I leave this subject, let me say one more word of caution to American inventors who take new things abroad. Suppose that you can get a *bona-fide* offer from a responsible person, of so much cash in hand here, he to take the invention to England and introduce it at his own expense, and you could—or think you could, which is generally the state of the case—get twice or three times as much by going to England yourself, never hesitate one moment in taking the ready cash. The one bird in the hand is worth not only two, but two thousand in the bush; but no one who has not been there and tried his best to make a foothold, and spent his time and all his money, and come back broken-hearted, as nine hundred and sixty out of every thousand have done, will see why this is so. Hobbs, the Yankee who picked all the locks as fast as they could be brought to him, told me two years ago that he was a fool not to have come home as soon as he made his notoriety, for on that capital he might have become rich and retired long ago; whereas, by staying in England he had, after eight years of hard work, just established a fair business. The intolerable prejudice of Englishmen against everything of foreign origin makes them receive the advances of strangers with great caution, and the labor of introducing our inventions is sometimes protracted to a disheartening length. Hence, while it is, of course, desirable, and, as matter of policy, absolutely necessary, that a good invention should be protected in England, France and Belgium, we had better let some good man in either of those countries pay us a fair price and run his own risks.

Your readers will all recollect the description and illustrations of Colvin's milking machine, recently published in the SCIENTIFIC AMERICAN. It has been out here on exhibition, under the joint auspices of the inventor and Mr. J. B. Kershow, a rich dairyman, who lives near Philadelphia. This old gentleman, seeing a description of the machine in one of your numbers, sent for the inventor, took him to his cow-stables, and told him to go to work and pump himself into a reputation. The machine worked so well that before Mr. Kershow had recovered from his surprise an hour had elapsed, and 24 cows were milked. So he bought an interest in it, and set Colvin fairly on his legs. The thing was tried early this morning, on a cow belonging to Mr. Merryman, of Maryland, one of the leading officers of the National Society. During the day I was looking at the cattle, and meeting with Mr. Merryman's Irish herdsman, asked him how the milker had worked. "Begorra, sur," said he, "it worked so well that before I could fill me pipe wid terbacky, he had her pumped as dhry as a whistle!" H. S. O.

A GREAT PIECE OF WROUGHT IRON.

The Novelty Iron Works, of this city, have lately completed one of the largest and heaviest pieces of wrought iron mechanism ever made in this city, and, if we are not greatly in error, in this country. It consists of a wrought iron center shaft and four cranks (two air pump and two main engine) for the steamer *Golden Gate*, of the Pacific Mail Steamship Company's line. The cranks weigh, in the rough, as they came from the forge, individually, 9,956 lbs.; the air pump cranks are bored from a solid block of metal weighing, each block, 14,336 lbs.; the pin for these cranks (a nice little affair to handle) weighs 6,614 lbs.; the two shafts amount, in the aggregate, to 16,528 lbs. These pieces are all bored out and turned to fit their several places, less the amount necessary for shrinkage; they are then expanded by heat and inserted in their proper positions, the contraction of the metal to its original size and the addition of two keys in each shaft secures the whole fabric beyond the possibility of detachment, whatever the strain it may be submitted to. As now finished, the job is a perfect specimen of workmanship, being without flaw or botch in the various stages of its construction. The forging was also done in this city, and is a handsome piece of smithing. The capacity of the Novelty Works to do heavy work is fully exemplified in this machinery.

A CENSOR AT THE PATENT OFFICE.

We understand that the Commissioner of Patents, in view of the many alleged instances of carelessness, error, and want of ability on the part of the examining corps of the Patent Office, has, or is about to create a new bureau, or official, who is to act as Censor over the Examiners. The new appointee is to be charged with the duty of overhauling the work of the Examiners, with a view to detect any errors in their interpretation of grammar, mechanics, science, and the application of the patent laws. He is to be a sort of literary scavenger or learned owl.

This new creation strikes us as an old fogy idea, and we are not suprised that it gives dissatisfaction among the examining officers. We do not deny that many errors have been and are being committed at the Patent Office. But when the Commissioner finds that such defects originate from the gross carelessness, want of education, or other incompetency of the official, his duty certainly is to purge the Office promptly of all such offending members, and not cast discredit upon the whole body of Examiners by appointing a watch or supervisor over them all.

Mr. W. B. Taylor, an Examiner, is, we learn, to be elevated to the dignity of Censor at the Patent Office. We had not, at the time of going to press, learned of his acceptance.

AMERICAN INVENTIONS IN ENGLAND.—The "universal Yankee nation" is something more than an unmeaning phrase. Our countrymen are everywhere to be found, and their ingenuity is recognized the world over. In a recent issue of the London *American*, we notice that, for the week ending August 18, seventeen English patents were granted for American inventions. Of this number twelve were secured through our European Patent Agency. The journal from which this fact is quoted, is published every week in London, and is an interesting and well-conducted paper.

TO PROTECT A SHINGLE ROOF FROM FIRE.—The editor of the *Albany Knickerbocker* says, that a wash composed of lime, salt and fine sand, or wood ashes, put on in the ordinary way of whitewashing, renders the roof fifty-fold more safe against taking fire from cinders, or otherwise in case of fires in the vicinity. It pays the expense a hundred-fold in its preserving influence against the effect of the weather. The older and more weather-beaten the shingles, the more benefit derived.

RECENT AMERICAN INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions, the reader is referred to the official list on another page:—

KALEIDOSCOPE.

Since the invention of the kaleidoscope, manifold experiments have been made to turn these neat and entertaining instruments to a useful purpose, and not without success, for it has recently been found that by the aid of a kaleidoscope, beautiful patterns for embroidery or for painting or for engraving, &c., can be produced. The manner in which this is effected is as follows: a small picture of a flower or a piece of lace, or anything which may be found to serve the purpose, is placed under the keleidoscope, and the picture produced by the same is copied by the aid of a photograpic camera. The success of this operation depends in a great measure upon the angle of the kaleidoscopic mirrors, and it sometimes happens, that by placing the mirrors at a certain angle, the picture which is produced, gives no satisfaction at all, whereas, if the angle can be changed, and made either larger or smaller, the most satisfactory result is obtained. For this reason, the kaleidoscope which forms the object of this invention, is arranged in such a manner that the same contains a number of mirrors placed at different angles, or that the angle of the mirrors can be changed at the will of the operator, so that the angle of the mirrors can be adapted to the picture to be produced, or that several different pictures can be produced with the same iustrument. The credit of this invention is due to Messrs. A. C. McNulty and D. Lyman, Jr., both of this city.

BALANCE SPRINGS OF WATCHES, &C.

The object of this invention is to provide in a better manner than has heretofore been done, for the adjustment of the balance spring to obtain for it the isochronal condition or property upon which the correct performance of a watch or chronometer is so much dependent. The isochronism of the balance spring is that condition or property which causes all the vibrations of the balance, whether they be long or short, to be produced in the same length of time. This property of the spring is usually obtained by making the spring of some particular length, which cannot be known at first, but is found by repeated trials of different lengths with every spring, which mode of operation is extremely tedious, vexatious and uncertain. It is sometimes obtained by compressing or enlarging the several coils which compose the springs; but this method is objectionable inasmuch as it has a tendency to destroy the regularity and uniformity of the volume of the spring, and is apt to leave it in a cramped and unnatural form. This invention consists in forming at that end of the balance spring which is secured to the fixed stud a coil making at least one full turn around the axis of the balance but not forming a regular continuation of the coil of the volume of the spring, by which construction the spring is made to present a definite adjustable portion where alterations may be made to obtain the isochronal condition without altering its length or disturbing the regularity of the main volume of the spring. This improvement was designed by G. P. Reed, of Roxbury, Mass.

TYPE-SETTING.

The object of this invention is, first, to facilitate the handling of composed matter without danger of knocking it into *pi*. This is obtained by the employment for the purpose of setting up the type of a permanent column-galley, where it shall remain until distributed; and in order to more perfectly obtain this object, movable end rules and justifying rules are added, whereby greater facility in taking proofs and correcting matter is effected. The second main object of this invention is to save the time and trouble spent in justifying lines, which is accomplished by the employment of spring spaces made of steel, brass, gutta-percha, india-rubber or any other elastic material, and used in place of the ordinary solid spaces. The importance of this invention will be duly appreciated by every practical printer. This invention was patented this week by D. B. Dorsey and E. Matthers, of Fairmount, Va.

FORCE PUMP.

This invention consists in the application of a loaded truck or a weight to a pump, arranged in such a way that a great saving is effected as regards the application of power and other advantages obtained in cases where water is to be elevated a considerable hight; the usual heavy timbers, rollers, straps, bolts, under plates, &c., being dispensed with, and the pump admitting of being driven or operated with greater speed than those arranged in the ordinary way. The patentee of this invention is John Holmes, of Schuylkill, Pa.

SPORTSMAN'S SADDLE.

This invention consists in attaching to the front part of the saddle, a bar which extends outward from the saddle at either side, in such a manner that a fowling piece or rifle may be suspended thereto, the bar admitting of being turned so that it, as well as the rifle or other fire-arm, cannot serve as an obstruction in passing through underbrush. The bar may also serve as a means of supporting an umbrella when necessary. This improvement was designed by J. Commins, of Charleston, S. C.

TOOL SHARPNING MACHINE.

This inventfon consists in a machine whose principal elements are a hone carriage and a tool holder, said carriage having a reciprocating rectilinear motion in a direction parallel, or nearly so, with the edge of the tool, and a gradual or step by step movement in a transverse direction, and the tool holder being applied in a peculiar manner relatively to the said bed, so that the tool may rest upon the hone at any required inclination to the face thereof, according to the degree of bevel desired. J. C. Cooke, of Middletown, Conn., is the patentee.

The following inventions were unavoidably crowded out in our last number:—

HOT AIR FURNACE.

The object of this invention is to produce a furnace, which will take up but little room, and which with a small expenditure of fuel will heat a large quantity of air. The heat is conducted from the fire-place through pipes of a serpentine shape and put together out of several parts, each of which can be cast. These serpentine pipes when put up, form radiators of a very extended area, so that a large quantity of air is brought into contact with the heated surface of said radiators, and that a furnace is obtained which takes up little room, and which will produce a good effect with a comparatively small quantity of fuel. Each leg of the radiator can be cleaned out by a separate door. The credit of this invention is due to A. H. Bartlett, of Spuyten Duyvil, N. Y.

CALENDAR CLOCK.

The object of this invention is to produce a calendar clock, which by a simple arrangement of parts shows the number of the current year, the name of the current month, the days of the month, and the day of the week, and also the leap year, and the years between leap years by figures 1 2 3, for a period of 9,999 years, or for any desired number of years, by an addition of wheels for showing the date of the year. All the changes from long months to short ones, and *vice versa*, and long years to short ones, and *vice versa*, are produced by a double series of grooves of varying depths in the circumference of the year wheel, said grooves being so arranged that the same governs the position of the levers and pawls, which latter serve to impart an intermittent rotary motion to the year wheel and to the month wheel. The credit of this invention is due to T. F. Strode, of Nortonville, Pa.

FEEDING PAPER TO PRINTING PRESSES, &C.

With this invention the sheets of paper are carried from an adjustable table and delivered upon a paper-ruling machine, printing-press, or any machine requiring the feed of a single sheet at a time. The invention consists in combining one or more friction feed rollers with an adjustable stop, or stationary piece of rubber, and in arranging these in such a relation to the table on which the paper is held, that the rollers will carry the sheets one at a time, between the feed roller and rubber stop. The patent as now re-issued, covers broadly one or more feed rollers arranged by the side of a friction stop, as it has been found by a series of practical experiments, that one feed roller will serve the double purpose of drawing the sheets from the *pile*, and passing them to the printing press or ruling machine, with great rapidity. The patentees of this invention are G. H. and S. Ferguson, of Malden Bridge, N. Y.

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING OCTOBER 2, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

. Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., ublishers of the SCIENTIFIC AMERICAN, New York.

30,189.—J. D. Alvord, of Bridgeport, Conn., for an Improvement in Making Emery Wheels:

I claim the method described of making emery wheels, and which consists in pressing or casting the wheel upon a flanged tube, so that when the wheel contracts in drying, the central part thereof will have lateral support, and thus be prevented from cracking, and so that the wheel will become firmly attached to the tube and flanges, all as represented and described.

[This invention consists in so arranging the flanges which hold the wheel that the space between the same, when they are secured to the eye, decreases nearly all the way down to the eye, and that when they are attached to the wheel, while the substance constituting the same is yet in a plastic state, the peculiar form of the space between the flanges, allows the substance to contract without causing it to crack as it hardens.]

30,190.—John Andrews, of Elmira, N. Y., for an Improvement in Grinding Circular Saws:

I claim, first, The anti-friction rollers, E, when arrangea in the manner set forth for the purpose specified.

Second, The manner of presenting the saw to the stone by means of a separate frame resting on a slide and moved by the set screw C.

30,191.—H. G. Armstrong, of Philadelphia, Pa., for an Improvement in Paper Bag Machines:

I claim, first, The employment, for severing the folded paper, of the upper and lower knives with their edges, X and Y, arranged in respect to each other, substantially as set forth, in combination with the revolving striker, k, or its equivalent.

Second, In combination with the said knives and striker, I claim the rollers U and V, for retaining the end of the folded paper during the operation of the striker.

Third, The roller, Q Q′, in combination with the blade, N, the upper roller having one or more collars, n n, so arranged in respect to openings in the blade that the action of the rollers on the folded paper cannot interfere with the said blade, as set forth.

Fourth, The horizontal rollers, K K′, and the guide blocks, J J′, arranged in respect to each other and to the blade, N, substantially as and for the purpose set forth.

Fifth, The plate, L, with its projections, l and l′, or their equivalents, arranged and operating as set forth for the purpose specified

Sixth, Causing one edge of the paper to traverse in contact with a ratchet or notched wheel, b, arranged to revolve in a trough containing the paste as set forth, for the purpose specified.

30,192.—S. W. Barr, of Mansfield, Ohio, for an Improvement in Velocipede Vehicles:

I claim in three-wheel wagons the peculiar arrangement of the spring clutch, o, hand levers, c c, and break arms, e, in combination with the devices for applying the motive power and guiding the wagon, as described and for the purpose set forth.

30,193.—Henry Behn, of New York City, for an Improved Alarm for Doors:

I claim the arrangement of a hinged plate, B, acting on arms or levers fast on a shaft and placed in the opening of a door, when combined with a bell or alarm, and operated in the manner and for the purpose substantially as specified.

30,194.—W. B. Billings, of New York City, for an Improvement in Vapor Lamps:

I claim, first, The use of the hollow heater, B, when constructed substantially as described and provided with the broad flange, D, for the purposes set forth.

Second, I claim the use of the removable flange, F, in combination with the heater, B, and broad flange D, when constructed substantially as described, for the purpose of regulating the heat and the illuminating power of the lamp, thus adapting the same to burning different materials.

30,195.—J. F. Blondin, of Niagara Falls, N. Y., assignor to himself; Frank Douglas, of Norwich, Ct.; N. H. Spofford, of Boston, Mass., and J. B. Hernshoof, of Seekonk, Mass., for an Improvement in Skates:

I claim the supports, E E, hinged or jointed to the heel, in combination with a skate, for the purposes substantially as described.

I also claim the arrangement of the adjustable bars, I, screws, K, swivel block, n, plate, s, and strap, L, for the purposes described.

30,196.—E. I. Bodrio, of St. Louis, Mo., for an Improvement in Machine for Drying Grain:

I claim the combination of the cylinders, B, the pipes, r and v and y, the diaphragm plate, o, and the furnace, K, the whole being arranged and operated substantially as described.

30,197.—C. K. Bradford, of Lynn., Mass., for an Improvement in Gaiter Boots:

I claim in a gaiter boot having a front and flap divided by a side opening, as shown, the holding up and fastening of said front and flap to each other and to the ankle of the wearer by means of the strap, B, fastened to said fore part and passing through a slot, f, thence around the ankle and buckled to the flap, C, as described and represented.

30,198.—Jehu Brainerd of Cleveland, Ohio, for an Improvement in Rotary Harrows:

I claim in rotary barrows feathering the teeth thereof, substantially as described.

30,199.—W. C. Bridges and D. P. Dietrerh, of Philadelphia, for a Hose Protector:

We claim the described hose protector, composed of two sheets of gum elastic or other suitable flexible material connected together at one end, the lower sheet being furnished with transverse ribs, a a, and the whole being constructed and applied substantially in the manner set forth for the purpose specified.

30,200.—R. M. Brooks, of Greenville, Ga., for an Improved Cotton Press:

I claim the arrangement of the box, B, the trunnions, x, projecting pieces, a a, working in grooves or openings in the frame pieces A A, the head, D, arms, d d, block, c, and screw, E, with the frame pieces A′ and A″, and gear wheels, F G, when the same are constructed and used as and for the purpose specified.

30,201.—Ferdinand P. E. Carré, of Paris, France, for an Improvement in Apparatus for Freezing Liquids:

I claim the general arrangement of apparatus described for producing cold in manufacturing ice by chemical agents

30,202.—S. R. Bryant, of Waterford, Pa., for an Improvement in Beehives:

I claim first, The rotating cap, b, perforated at one side and fitted within a circular recess, d, at the center of the bottom, A, of the hive the bottom within the recesses having openings, e, made through it, to form a ventilator, as set forth.

Second, Constructing the bottom, A, of the hive, elevated within the body, so as to form a ledge j, for the parts, C, to close against, and having the outer part of the bottom inclined or beveled and made horizontal beneath the parts, C, for the purpose specified.

Third, Constructing the comb-frames, D, with diagonal braces, m n, and having the upper cross rails, a, grooved, to form ledges or guides, O, for the combs, as set forth.

[This invention consists in a novel and improved construction of the hive, whereby several advantages are obtained over those hitherto constructed.]

30,203—James Brown and Lyman Bridges, of Chicago, Ill, for an Improved Furnace and Cooking Range:

I claim the arrangement of coils of hot water pipes, N1 N2, at both sides of the reversible ovens, B B, in combination with a combustion chamber, G, hot air-chamber, D, and coils of hot water pipes, P and P', all the parts constructed and connected, substantially as and for the purposes set forth.

30,204.—Cyrus Chambers, Jr., of Philadelphia, Pa,, for a Copying Press:

I claim, first, The combined stand and press, constructed substantially as described.

Second, The combination of the bed toggle, platen, and treadle, for the purpose and substantially in the manner specified.

Third, The stops, m n o p, on the arms of the toggle, arranged and operating as specified.

Fourth, The lugs or stop, i, on the platen, F, to determine the position of the book in the press.

Fifth, The combination of the mortise and screw, for the purpose set forth.

Sixth, Casting the column, frame, and bed in one piece in the manner described and shown.

30 205.—Francis J. Collier, of Philadelphia, Pa., for a Label-holder:

I claim the described label-holder having the end retaining flanges, e and e', the curved slide flanges, f and f', the recesses, y y and openings, m and n, arranged substantially as and for the purpose set forth.

30,206.—James P. Collins, of Troy, N. Y., for an Improved Hanger for Shafting:

I claim the combination with the shaft box, F, trunnions, g, and and adjusting screws, h, of the shell, D, arm, E, rod, C, curved plate, B, arbor, b, screw, c, and frame, A, in the manner and for the purpose shown and described.

I also claim the peculiar arrangement of the cap G, with the trunnions and the rod, C, as and for the purpose shown and described.

[The object of this invention is to obtain a bearing of simple construction which will have an universal adjusting movement, and at the same time be properly supported at all points, so as to admit of belts being applied to the shafting in any direction.]

30,207.—John Commins, of Charleston, S. C., for an Improvement in Saddles:

I claim the bar, B, attached to a saddle, essentially as and for the purposes set forth.

30,208.—J. C. Cooke, of Middletown, Conn., for an Improved Machine for Sharpening Tools:

I claim the combination of the reciprocating carriage, B, and the transversely moving hone bed, C, with the tool stock, L, by means of a bar, M, applied, and having the tool stock fitted to it, substantially as and for the purpose described.

30,209.—J. D. Custer, of Norristown, Pa., for an Improved Saw-grinding Machine:

I claim the slotted wheel, K, constructed as described, and operated in connection with the hook, P, and pin, N, in front of a traversing grindstone, for grinding and polishing saws, as set forth.

30,210.—Jean de Lihatcheff, of Yaroslawl, Russia, for an Improved Machine for Planing Staves:

I claim supporting the frame or table carrying and presenting the staves to the planing tools, and at various parts of its length, upon a series of eccentrics mounted upon shafts having pinions at their extremities, each and all of which are operated by means of one common transverse shaft provided with a worm or endless screw, as set forth, and for the purpose and purposes specified.

30,211.—D. B. Dorsey and E. Mathers, of Fairmount, Va., for an Improvement in Setting Type:

We claim the employment of a permanent column galley, A, arranged with end rules, a b, and with a justifying rule, B, substantially as and for the purpose set forth.

30,211.—J. B. Duane, of Schenectady, N. Y., for an Improvement in Seeding Machines:

I claim, first, The arrangement of the toothed bars, b b, and perforated plates, h i, outside or in front of the hopper, G, substantially as and for the purpose specified.

Second, The adjustable board, N, placed relatively with the shake-board, M, harrow, O, and drags, Q, to operate as and for the purpose set forth.

Third, The arrangement of the lever frame, D, roller, E, bars, b b, shaft, B, and castor wheels, C C, substantially as shown and described, for the purpose set forth.

Fourth, The combination of the vibrating board, M, hopper, G, with the reciprocating agitators, l l, the seed-box, S, harrow, O, drags, Q, frame, D, with roller, E, attached and connected to the shaft, B, by the rods, b; all arranged for joint operation as set forth.

[This invention is designed to sow seed broadcast on newly-turned sod without breaking or disturbing the latter, and, at the same time, perform the work in a perfect manner, and with a capacity of freeing itself from all obstructions, and without being liable to choke or clog.]

30,213.—J. T. Eichberg, of New York City, for an Improved Parasol and Fan:

I claim, first, Arranging the handle of a parasol, substantially as described, so that a portion of the same can be taken off at pleasure and used as a fan.

Second, Arranging the fan, D, which forms the end of the handle, B, of a parasol with folding sides of a tapering form, substantially as set forth, so that the same, when closed, forms a case which protects the fabric of the fan, and which produces a good and convenient hold for the hand.

[This invention consists in arranging the handle of a parasol in such a manner that a portion of the same can be taken off and used as a fan when it is desired; and it consists, also, in the arrangement of the fan, which forms the end of the handle, with folding sides, united by hinges and spring catches, or in any other convenient manner and of a tapering form, which, when folded up, form a case or box that runs down tapering towards one end, which, when rounded, can be fastened by means of a spring catch in a suitable socket attached to the outer end of the handle, whereby the fan is rendered convenient for the hand to take hold, and, at the same time, the fabric of the fan is protected.]

30,214.—Israel Forman, of Grafton, Va., for an Improved Culinary Apparatus:

I claim the chest or box, A, with an inclined top water receptacle in its bottom, and provided with a movable sliding door, B, flanges, a, shelves, C C', and otherwise constructed and arranged as and for the purposes set forth.

30,215.—T. N. Foster, of Watertown, N. Y., for an Improvement in Harvesters:

I claim the arrangement of the three-hinged frames, N N' A and B, with their hinges, in relation to each other, the axle, A2, and inner driving wheel, A3, in combination with the rigid and flexible draught connection, D D', operating jointly in the manner and for the purpose described.

30,216.—A. J. Fullam, of Springfield, Vt., for a Stencil-printing Machine:

I claim a stencil-printing or marking machine, as composed of a rotary brush, C, or its equivalent, a stencil plate, D, and a sheet-supporter or carriage, B, combined together, and with mechanism for rotating the brush or for revolving it and moving the sheet-supporter or carriage, substantially as and for the purpose specified.

30,217.—J. P. Gay (assignor to himself and D. C. King), of Cincinnati, Ohio, for a Composition for Roofing Purposes:

I claim the composition described, consisting of the various ingredients in the proportions named, or similar proportions, substantially as and for the purpose described.

30,218.—P. A. Gladwin, of North Providence, R. I., for an Improved Sash Fastener:

I claim a lever with a curved end, k, or its equivalent, moving eccentrically on a pivot, constructed and operating substantially as described, for the purposes specified.

I also claim the combination of such a lever with a locker and spiral spring, or their equivalents, constructed, arranged and operating substantially as described, for the purposes specified.

30,219.—Israel Grafius, of Alexandria, Pa., for a Portable Fire-escape:

I claim a portable fire-escape, constructed of a folding frame, A, covered by an elastic sheet, B, and cushion, C, and having its edges protected by a stout elastic tube, D, and operating in the manner and for the purpose set forth.

[The object of this invention is to provide the means to catch persons leaping out of a window, without requiring the assistance of more than one or two persons.]

30,220.—Robert Harper, of Trumbull, Ohio, for an Improvement in Tanning:

I claim the use of the above-mentioned weeds, in combination the aforesaid drugs, in the proportions named; thereby facilitating the process of tanning, as well as being much cheaper than the usual process of tanning with bark.

30,221.—John Holmes, of St. Clair, Pa., for an Improvement in Pumps:

I claim the arrangement of the loaded truck, D, rod, F, plunger rod, F', with the pump, G, chain, E, frame, C, and rod, D', as and for the purposes set forth and described.

30,222.—S. J. Homan, of Walden, N. Y., for an Improvement in Hay Rakes:

I claim attaching the rake tooth to the axle, C, and mounting the thills on the hubs of wheels, A A, and the driver's seat on the thills, substantially as and for the purposes set forth.

[The nature of this invention consists in dispensing with a frame and using the rake-head or bar to which the tines are attached as the axle for the carriage wheels, thus making the rake-head serve two purposes; and it also consists in attaching the rear ends of the thills to hubs which are on the inside of each wheel, and in mounting the driver's seat on the thills.]

30,223.—C. B. Hurxthal and John Lee, of Boliver, Ohio, for an Improvement in Gates

We claim the arrangement of the inclined standard, B, slots, C and C', spring, a, levers, E, and fixed bearing, F, and weight, b; the whole operating as set forth.

30,224.—Wm. Humphreys, Jr., of Cold Spring, N. Y., for an Improvement in Rotary Engines:

I claim, first, The annular arrangement of the recesses, e, in the cylinder, B, in combination with the flanges, c c', on the piston, C, and with the cylinder-heads or covers, i, constructed and operating substantially as and for the purpose described.

Second, The arrangement of the adjustable packing plates, k, in the ends of the sliding abutment, D, constructed and operating substantially as and for the purpose set forth.

Third, The arrangement of the abutment, D, in the interior of a closed box, E, in combination with the pipe, e2, constructed and operating substantially in the manner and for the purpose specified.

Fourth, The arrangement of the hand rockshaft, r2, with eccentric rollers, v v', and a pinion, i, in combination with the valves, t t', and eccentrics, I I'; the whole constructed, combined and operating as and for the purpose described.

[The principal object of this invention is to prevent the escape of steam at and around the working surfaces of the engine; and also to arrange the steam valves in such a manner and in such relation to the steam cylinder that, by a simple change in the position of the hand wheel, the engine can be reversed.]

30,225.—Joseph Harvey and Edwin Ford, of Philadelphia, Pa., for an Improvement in Handles for Canes, &c.:

We claim the art, process or mode of making handles shown and described, consisting substantially in the employment of forms or models composed of tapered angles and the providing of the sections of which the handle is to be composed, with tapered apertures, and the fitting of said sections upon said tapered angles; all as set forth and represented.

30,226.—W. F. Johnson, of Philadelphia, Pa., and J. Doyle, of Wetumpka, Ala., for an Improvement in Sugar-cane Harvesters:

We claim, first, The double axle, C, or an axle formed of two parts, a a, connected by a clasp, E, or its equivalent, in connection with the right and left screwshafts, F F, fitted in the parallel beams, A A, to which the parts, a a, of the axle are attached, for the purpose of admitting of the lateral adjustment of the cutters, O, to suit the width of the space between the rows of cane, as set forth.

Second, The employment or use of the cutters, O, and knives, T, when placed on shafts, T R, and used in connection with leger blades, m, beaters, S, and guide rods, W, for the purpose of cutting, simultaneously, the cane at top and bottom, as described.

Third, The arrangement of guide rods, X, and pendent curved rods, Z, in connection with the discharging levers, B', substantially as shown, for the purpose of allowing the cut cane to be discharged from the machine in gavels, as set forth.

Fourth, The arrangement of the sliding shafts, L, with slides or bearings, f', levers, h, and shafts, M, substantially as shown, to admit, when necessary, of the cutters, O, as well as the knives, T, being readily thrown out of gear, and the cutters, O, at the same time, elevated.

[The object of this invention is to obtain a machine which will cut the standing cane (two rows simultaneously), top the cane, and allow of the same being discharged in gavels; the several parts being so arranged as to admit of adjustment to suit the varying widths the cane may be grown apart in rows, and also to suit the length of the same; the latter features being necessary, in order that the cane may be properly topped, and the cutters adjusted so that they may, in all cases, be brought in line with the rows.]

30,227.—Wm. H. Johnson, of Richmond, Ark., for an Improvement in Cotton Cleaners:

I claim the combination, with a cotton gin, of an inclined flue, having a continuous slotted bottom with curved tapering passages through it, and the fan beaters; said parts being arranged and operating, relatively to one another, substantially as and for the purposes set forth.

30,228.—Frederick Jonas, of McConnell's Grove, Ill., for an Improvement in Breech-loading Fire-arms:

I claim, first, The connection of the barrel, C, with the frame, A, by means of a spring, D, applied as described, to serve both as a flexible joint and as a means of returning the barrel to its position for firing, substantially as described.

Second, The arrangement of the cocking lever, K, in combination with the trigger-guard lever, E, substantially as described, to provide for the operation of the said lever, K, either by or independently of the trigger-guard lever.

[This invention relates to that class of breech-loading fire-arms whose barrels are raised at the breech end for the introduction of the charge in a forward direction. It consists, principally, in certain means of cocking the hammer, either independently of the opening of the breech or by the act of opening the breech by a trigger-guard lever applied for the purpose.]

30,229.—J. F. Keeler, of Cleveland, Ohio, for an Improvement in Freight-car Locks:

I claim the spring lock and hasp, in combination with the provisions for sealing the escutcheon, as described.

30,230.—John Koppe, of New York City, for an Improvement in the Glass or Metal Harmonicons:

I claim producing a scale of tunes, hanging the plate, A, of a pianoforte upon two threads, u u, passing over two rows of pins, e, in such manner that each end of each plate, A, shall be supported between two inclined portions, n' n', of thread, n, for the purposes described.

30,231.—S. T. Lamb, of New Washington, Ind., for an Improvement in the Cutting Apparatus of Harvesting Machines:

I claim a cutting apparatus, composed of the following elements, viz: a guard hollow above and below the cutter blades, opening above, below and in rear of the cutter bar, and fingers on top, extending in a curve forward to the cutters and laterally to each other, to form a line in close proximity with the cutter blades and a cutter bar, supported on all four sides on independent bearers; all substantially as and for the purpose described.

30,232.—H. S. Lesher, of Brooklyn, N. Y., for an Improvement in Diaper Pins:

I claim combining with the pin, A, and tube, B, jointed together as described, the cross hook bar, C, or its equivalent, for holding the point of the pin, A, in place within said tube, substantially as set forth.

30,233.—D. C. Lockwood, of Derby, Conn., for an Improvement in Martingale Rings:

I claim, as a new article of manufacture, a martingale ring having its metallic lining interlocked with its sides, substantially as and for the purpose described.

30,234.—C. B. Long, of Worcester, Mass., for an Improvement in Planing Valve Seats for Steam Engines:

I claim the arrangement and combination of the carriage, B, and its feeding mechanism with the supporting frame, A, the cutter carriage, F, and its mechanism for imparting to it reciprocating longitudinal movements, as described; the whole being substantially as and for the purpose as specified.

I also claim the combination and arrangement of the parts for operating the screw, H, for effecting the reciprocating movements of the cutter carriage, F, such parts being the two tubular shafts, K L, the clutch, P, the pitman or slide rod, R, the bifurcated lever, S, the weighted lever, T, and its shouldered rod, V, and the bent arm, U; the whole being applied to the set screw and to the two carriages, B and F, and the tubular shafts, K L, being geared to the driving-shaft, substantially as described.

30,235.—F. H. Manny, of Rockford, Ill., for an Improvement in Harvesters:

I claim the arrangement of the beams, a b c d, relatively to the finger beam and main frame, and to each other, substantially as described, for the purpose set forth.

30, 236.—N. H. McLean, of the United States Army, for an Improved Window-curtain Fixture:

I claim the large wheel or roller, 1, and the two wheels or rollers above it, 2 and 3, the sliding carriage, E F G H, the spring, S, and rod, R, when arranged and combined substantially as and for the purpose specified.

30,237.—L. J. Masterson, of Newton, Mass., for a Self-adjusting Skate:

I claim, first, The spring foot-piece, C J B, locked to the runner, A, by the pressure of the foot, substantially as set forth.

Second, I claim the clamps, E, operated by the descent of the heel piece, C, substantially in the manner described.

30,238.—A. C. McNulty and D. Lyman, Jr,, of New York City, for a Kaleidoscope:

We claim the arrangement of two or more pairs of kaleidoscopic mirrors, A, in one case, B, substantially as and for the purpose set forth.

36,239.—D. M. Mefford, of Jeffersonville, Ind., for an Improvement in Machines for Stemming Corn Husks:

I claim the combination of the toothed picker, B, griping cylinder, G, and guard, J, operating in the manner and for the purposes set forth.

30,240.—C. R. Otis, of Yonkers, N. Y., for an Improvement in Oscillating Engines:

I claim the employment, in combination with a steam chest, arranged at one side of the cylinder of an oscillating engine, and having the bearing of one trunnion resting upon it, of two arms, G G, secured to the said chest, for the purpose of supporting the opposite trunnion, also, from the steam chest, substantially as described, for the purpose set forth.

[This invention was illustrated and described on pages 161 and 162 of the present volume of our paper.]

30,241.—E. G. Otis, of Yonkers, N. Y., for an Improvement in Oscillating Engines:

I claim, first, The arrangement of the steam chest, B, containing the two sets of passages, d* d' d' d'' d'' e* e' e' e2 e2, in such a manner as to constitute the main framing of the engine; that is to say, as to support the bearings of the main shaft and of one trunnion of each cylinder, substantially as described.

Second, The arrangement of the steam chamber, n, in the bed-plate, in communication with cavities in the standards, F F, for supporting the outer trunnions, whereby the outer trunnion bearings are caused to rise and descend with the inner ones, as the latter rise and descend with the expansion of the steam chest, B.

Third, The springs, L' L, applied to the outer trunnions, substantially as and for the purpose specified.

[This invention is illustrated and described on pages 161 and 162 of the present volume.]

30,242.—Auguste Pellet, of Paris, France, for a Process of Ornamenting Leather Cloth:

I claim the peculiar succession of operations to secure the firmness and durability of the ornaments, consisting of, first, ornamenting the unvarnished tissue with colors that sink to the surface thereof, and then varnishing and rolling the same to complete operation; and this I claim as my invention, for the purposes set forth.

30,243.—M. R. Pelletreau, of New York City, for an Improvement in Bookbinders' Standing Press.

I claim the arrangement of the guide-rack bars, G, pinions, E E, shaft, D, worm wheel, L, screw, C, and shaft, M, with the followers, A3 I, and top and bottom plates, A A, as shown and described, whereby the press is strengthened, the followers guided, and the lower follower quickly adjusted; all as set forth.

[The object of this invention is to produce a strong and durable press for bookbinders, which allows of quickly adjusting the load to and removing it from the upper follower without the use of filling boards.]

30,244.—William Phelps and Clark Wright, of Sycamore, Ill., for an Improved Washing Machine.

We claim the described arrangement of a smooth board, G, and a corrugated rubber, H, fixed obliquely in opposite outside corners of each of a series of chambers mounted on the extremities of revolving arms; the said parts being constructed and combined in the manner and for the purposes set forth.

30,245.—E. A. Prescott, of Worcester, Mass., for an Improvement in Revolving Fire-arms.

I claim the combination of the lever-like locking dog, G, the elbow-shaped unlocking lever, H, and the stud, l; the whole applied and operating, in connection with and relatively to the hammer, substantially as specified.

And I further claim the rearward projection on the front part of the frame, having its upper part made V-shaped and sharp-edged (as illustrated in Figs. 5 and 2), for the purpose specified.

[This invention consists in a novel, simple and effective mechanism for locking and unlocking the cylinder, whereby it is caused to be positively locked while the hammer is cocked, and while it is down, and during the whole striking movement, and only unlocked at that stage of the cocking operation during which the rotary movement is required to be effected.]

30,246.—I. M. Potter, of Providence, R. I., for an Improvement in the Manufacture of Sheet Metal Finger Rings, &c.:

I claim the use of a "former" (Fig. 5) when used in the manner described for the purposes specified.

30,247.—G. P. Reed, of Roxbury, Mass., for an Improvement in Watches:

I claim the construction of a flat or cylindrical balance spring for a watch or other time-keeper, with an adjusting coil, a a, o r e e, substantially as described, making at least one full turn round the axis of the balance, but not forming a regular continuation of the coil of the spring.

30,248.—T. M. Richardson, of Stockton, Maine, for an Improved Device for Securing Plane Bits:

I claim the arrangement of the clamp wedge, E, the pitman, F, the inclined plane, G, and the screw, H, with the plane iron, D, its cap bearing, C, and the stock, A, substantially as described.

30,249.—Charles Robinson, of Cambridgeport, Mass., for an Improved Clothes Dryer:

I claim the combination and arrangement of the rod, B, with its catch, b, hub, D, with its radial arms, d d, and the elastic cords, f f; the whole forming an improved article of manufacture, substantially as and for the purposes specified.

30,250.—George Sanford. of Providence, R. I., for an Improvement in the Manufacture of Bracelets:

I claim the improvement described in the method of making the half band for ladies' bracelets and similar articles, that is to say, in forming both the outer and inner surfaces from a single piece of sheet metal, substantially as specified.

30,251.—Wm. Scarlett, of Aurora, Ill., for an Improvement in Biers:

First, I claim, in biers constructed with windlasses for lowering the coffin, the arrangement of the longitudinal cords, C C, and cross supports, D D, adapted to slide thereon, substantially in the manner and for the purposes set forth.

Second, I claim so arranging the cords, C C, and straps, E E, or their equivalents, upon the windlasses, B B', that a continued rotation of the latter lowers the coffin and then disengages the sliding supports, D D, or their equivalents, therefrom, substantially in the manner above specified.

30,252.—G. W. Scollay, of St. Louis, Mo., for an Improvement in Glass Coffins:

I claim, first, Making a glass coffin with the rib, I, near the upper edge thereof, and in combination with the flange, v, to strengthen and stiffen the said flange and upper edge of the coffin, to serve as a basis for the lid to rest upon, and as a handle to lift the coffin by, and—

Second, I claim making the upper edge of the body of the coffin and the lower edge of the lid thereof, with the flange and lateral grooves, in the manner described for the purpose specified, and—

Third, I claim the use of a valve or cock in combination with a coffin arranged in the manner described, so that a pipe can be attached to exhaust the air out of the coffin when said cock and coffin are of glass, and—

Fourth, I claim the use of the glass plugs, b (the head of which is shown in Fig. 2, by b), for the purpose of uniting the lid to the body of a glass coffin more firmly than the cement would unite it unaided by the said plug.

30,253.—J. P. Scudder, of Hightstown, N. J., for an Improvement in Potato Diggers:

I claim constructing the elevator with a series of open or grated bottom radial chambers, and corresponding series of open curved fingers, j, which are caused to pass through a series of open fingers, k, upon the digger, as set forth.

30,254.—S. B. Sexton, of Baltimore, Md., for an Improvement in Cooking Stoves and Ranges. Antedated Sept. 17, 1860:

I claim the arrangement of chambers, A B and C, and flues, a b c d e and F, with the grate, G, constructed as described.

30,255.—H. M. Schaffer, of Bucyrus, Ohio, for an Improvement in Beehives:

I claim the within-described miller and robber trap constructed substantially in the manner specified, to wit: a box, A, provided with a wire gauze cover, and having two of its sides pierced with inclined holes, D D, one of its sides provided with a sliding door, and the other side provided with a flange or shelf, beneath, and above which long openings are cut; the whole being arranged and used as and for the purpose set forth.

30,256.—J. S. Sylva, of Savannah, Ga., for an Improvement in Ice-cream Freezers:

I claim, first, The arrangement of a triangular dasher, C, in combination with the cylindrical barrel, A, as described, so that in turning the dasher, its corners serve to keep the inside of the barrel clear of ice.

Second, The arrangement of the scraper, E, in combination with the hollow dasher, C, constructed and operating substantially as and for the purpose set forth.

[This invention consists in the arrangement of a triangular hollow dasher in combination with a scraper of corresponding form, in the interior of the barrel, in such a manner that on turning the dasher its three corners scrape off the ice which may adhere to the inside of the barrel, and, on moving the dasher up and down, its sides are scraped off clear by the action of the scraper, and that, by this arrangement, the formation of ice is considerably accelerated.]

30,257.—Samuel Slocomb, of Cambridge, Mass., for an Inkstand:

I claim, in combination with a well and a hollow plunger, the projection, f, formed of the same material, and at the same time that the bowl of the inkstand is formed and fitting into the opening, e, in the plunger, as set forth and represented, and for the purpose specified.

30,258.—E. W. Smith and J. H. Mars, of New York City, for an Improved Steam Boiler:

We claim the arrangement of the combustion chamber, D, relatively to the two tiers of furnaces and to the flues, or their equivalents, whereby the gases from the upper tier of furnaces are drawn downward and mingled with those from the lower tier, in the middle and lower portion of the combustion chamber, and the agitation and combustion is allowed to proceed in the large flues along the bottom of the boiler, and the heat is extracted in a series of smaller flues or tubes, which makes a partial return of the draft, and terminates in an uptake or equivalent connection, H, immediately behind the upper furnaces, substantially as set forth.

30,259.—Samuel Soule, of Cincinnati, Ohio, for an Apparatus for Printing Addresses on Newspapers:

I claim the moving plate, A, with platen attached, when used in connection with and made to traverse the forms in the chase, in this or any equivalent manner, for the purpose specified.

30,260.—August Spellier, of Philadelphia, Pa., for an Improvement in Revolving Fire-arms:

I claim the spring, I, or its equivalent, connected to and arranged on the frame, B, in respect to the revolving breech and hammer, D, substantially as specified.

30,261. C. F. Spencer, of Rochester, N. Y., for an Improved Hose Coupling:

I claim my improved packing for hose couplings, consisting of the loose ring, f, of india-rubber or its equivalent, in combination with the annular chamber, d, for retaining the same in a position to readily impact with the end of the inserted section, B, by the force of the water passing through the hose, substantially as set forth.

I also claim, in combination with said packing ring, the groove, i', on the neck of tube, B, and latch, g, or its equivalent, substantially as and for the purposes specified.

30,262.—G. A. Stephenson, of Paw Paw, Mich., for an Improvement in Reapers and Mowers:

I claim the combination of curved loops, D D, forming the main frame with the finger bar, B, cam wheel, E, with its adjustable journal boxes and pins, i i, when the parts are constructed, arranged and operated as described.

30,263.—J. A. Stewart, of Philadelphia, Miss., for an Improvement in Plows:

I claim the arrangement of an adjustable, triangular point, C, perforated at J' J J', cutter and landside, D, also perforated, and adjustable and mold board, A, of a plow; the whole constructed substantially as and for the purposes set forth.

30,264.—T. T. Strode, of Mortonville, Pa., for an Improvement in Adding Machines:

I claim, first, The combination of a registering apparatus, A, with the platform, C, and v-shaped guide strips, E E', constructed and operating substantially as and for the purpose described.

Second, The arrangement of the notched slide, D, in combination with the registering apparatus, A, constructed and operating substantially in the manner and for the purpose set forth.

[The object of this invention is to produce a simple, cheap and reliable device for adding numbers, that can be carried in the pocket with convenience, and used in the field or on a wharf, or in any place where it is desirable to have a machine for adding numbers, or which can be used in combination with a platform fitting on an account book, so that the several rows of figures on the said account book can be added up conveniently and with little trouble.]

30,265.—Darwin Talbot, of Ironton, Mo., for an Improvement in Saws:

I claim combining alternate short and long teeth, when the former are narrower at their cutting points than the latter, both being made as herein-before described.

30,266.—W. H. Towers, of New York City, for an Inkstand:

I claim combining with the body or reservoir, A, of the inkstand, having a circular opening, C, in its top, and a groove, F, around its periphery, a correspondingly perforated, turning cover, B, having lugs, E, on its rim, which move in said groove substantially in the manner and for the purpose set forth.

30,267.—Philip Ulmer, of Charlestown, Mass., for an Improved Bed Bottom:

I claim the combination and arrangement of the rubber webbing, the steel spring, the wood slat, and the leather strap, by which one length slat may be made adjustable to bedsteads of various lengths, substantially as and for the purpose specified.

30,268.—P. D. Van Hoesen, of New York City, for an Improvement in Wagon Wrenches:

I claim, first, The arrangement of the revolving head, A, provided with holes, b, of different sizes, in combination with the rotary handles, D, constructed and operating substantially as and for the purpose specified.

Second, The combination with the revolving head, A, and handle, D, of an additional stationary handle or supporter, E, constructed and operating substantially as and for the purpose set forth.

[This invention consists in the arrangement of a revolving head, with holes of different sizes in its sides, in combination with a rotary handle, in such a manner that the different sides of the head can be brought to face the nut or screw to be operated upon, and that, by the different sizes of the holes, provision is made for the different sized heads or nuts on a wagon. It also consists in combining with the revolving head and the rotary handle, an additional stationary handle or supporter, for the purpose of keeping the revolving head up against the nut or screw while the same is run in or out.]

30,269.—H. Y. Wildey, of Philadelphia, Pa., for an Improvement in Animal Traps:

I claim the arrangement of the movable shelf, D, box, K, cover, L, and sliding doors, J D', with the rods, E g, and weighted lever, E, as and for the purposes set forth and described.

[This invention is a self-setting trap for catching small animals, and intended especially for entrapping rats or mice without killing them. It consists in using a quadrangular box with a small hole in each end, and a cage attached to one end: and in arranging within this box a movable, horizontal shelf in such relation to the holes in the ends of the box, that when the trap is set the entrance hole is open and the exit into the cage will be closed, and when the shelf is depressed by the weight of the animal upon it, the entrance hole will be closed and the exit opened; said shelf is so balanced by a weight and lever that the weight of a mouse will be sufficient to overcome the balancing weight, and when this weight is removed, by the mouse passing into the cage, the shelf will return to its former position, thus making the trap self-setting.]

30,270.—Jonathan Warren, of Brooklyn, N. Y.. for a Pen Cleaner:

I claim a pen cleaner constructed of a bottle, A, with an inclined spout and with a curved back, and being provided with a brush, B, which is retained by a notch, c, under the neck of the bottle, as described.

30,271.—Maurice Vergnes, of New York City, for an Improved Electro-magnetic Helix:

I claim constructing a helix of a number of separate wires, when each of such wires is so arranged or coiled as to form a double lay, substantially as described, each lay lying against or in contact with the other, but not crossing it, and when such wires are so connected with each other, as described, that the section of the helix at right angles with the axis of its core, shall be increased as the distance from the battery is increased, such section being the greatest in the middle of the helix.

I also claim, in combination with a helix, the use and application of the armature or iron plates, k k', substantially as described, for the purpose of increasing the power of the helix.

30,272.—Maurice Vergnes, of New York City, for an Improvement in Electro-magnetic Engines:

I claim the arrangement of a series of electro-magnets disposed as the radii of a wheel, on a common center or axle, and revolving within stationary helices, and the polarization of which revolving magnets is constantly changed, as described, so that all such magnets shall have a like polarization when passing through one end of the helices, the polarization of which helices remains continually the same.

I also claim the general arrangement of the whole apparatus, substantially as and for the purposes set forth and described.

30,273.—J. A. Veatch, of San Francisco, Cal., for an Improved Gold Separator:

I claim the rotary disk, D, with or without the trough, C, in connection with a cup, E, communicating with the disk by a perforated space, e, substantially as and for the purpose specified.

[This invention, as the title implies, is to effect a thorough separation of the amalgam and mercury from quartz pulp, after the same has been treated by any of the ordinary means employed for separating the precious metals therefrom.]

30,274.—J. J, Watson, of Buffalo, N. Y., for an Improved Water Wheel:

I claim, first, the wheel, C, consisting of a series of buckets made and placed substantially in the form and position herein represented, together with the cylinder, G, and its arms, H H, and collar, I, as set forth.

Second, The lower wheel as constructed, revolving independently in the cylinder, G, and used separately or in connection with the wheel, C, when the whole are constructed and arranged to operate substantially as specified.

30,275.—Henry Wilkins, of Brownsville, Pa., for an Improvement in Furnaces for Steam Boilers:

I claim the combination of two furnaces or fires, separated by a division wall, with a return flue arranged as described, so that the smoke and products of combustion from one fire, after traversing its furnace, is caused to pass over the other fire, previous to its escape into the chimney, for the purpose set forth.

30,276.—McClintock Young, Jr., of Frederick, Md., for an Improvement in Reaping and Mowing Machines:

I claim the combination of the self-acting spring clutch lever, G, with the loose driving wheel, D, and fast gear wheel, E, for making a self-acting clutch, substantially in the manner and for the purpose described.

30,277.—W. T. Anderson (assignor to himself and H. S. Archer), of Brooklyn, N. Y., for an Improvement in Binding Engravings, &c.:

I claim the construction and arrangement of the sheets with joints or hinges at graduated distances from the back of the cover, increasing from the sides towards the middle of the book, so that the inner leaves will fold over those outside of them without breaking or coming loose from the cover, as described.

30,278.—E. H. Graham, of Manchester, N. H., assignor to B. H. Whitcomb, of Henniker, N. H., for an Improvement in Skates:

I claim hinging the fore end of the toe pad to the runner, so that it may be vibrated and adjusted to the hight of the heel of the boot or shoe, as required.

And, in combination with a toe pad hinged to the runner, as above claimed, I claim the screw, D, or its equivalent, for adjusting and supporting the rear end, substantially as described.

I claim fastening the heel pad to the runner by means of the dovetailing score, E, groove, H, and screw, F, substantially as described.

30,279.—Frederick Mathushek (assignor to himself and Wellington Wells), of New York City, for an Improvement in Pianofortes:

I claim, first, the combination and arrangement of the cross bars, 12, the wrest plank bar, 5, the wrest plank, 4, the string plate, 9, and the interior braces and bolts forming the framework of the pianforte, substantially as set forth.

Second, The mode of arranging the strings of a pianoforte, in combination with the arched or concave sounding board, so as to make a tension or pressure of the strings against the arch of the board and in the same direction with the stroke of the hammers, substantially as described.

Third, The wrest plank bar, 5, with the arrangement of the inverted bridge, 8, or its equivalent, and of the strings thereon, in combination with said bar and the wrest plank and cross bar, substantially as described.

30,280.—C. Watson (assignor to himself and A. H. Finsley), of Cascade, Va., for an Improvement in Harrows.

I claim the arrangement of the box, I, arm, z', rotary collar, H, upright axle, E, brace, G, beam, F, hub, A, and arms, B, all as shown and described, for the purposes set forth.

[This invention consists in a novel and improved means employed for loading the harrow, whereby the same may be made to rotate by the draught movement, and without creating any unnecessary friction or increasing the draught, but, on the contrary, diminishing the same greatly below the ordinary square and triangular harrows, and considerably below the other forms of rotary harrows.]

30,281.—E. R. Shepard, of Scranton, Pa., assignor to Abel Baker, of Carbondale, Pa., for an Improvement in Blind Hinges:

I claim, first, Arranging the flanges, g g', in the head, D, or on the screw, d, with two noses, m, in the manner and for the purpose set forth.

Second, Arranging the head and the screw, d, in such a manner that the connection rod, F, can be placed quite loosely into the sockets, j j', as and for the purpose specified.

[The principal object of this invention is to produce a cheap and effective hinge which allows of operating the blind without raising the window. It consists in a peculiar manner of attaching the endless screw and the head which serves for operating the hinge, to their respective guide plates by means of double-nosed flanges, whereby a connection rod can be used which is placed quite loosely into the socket in the screw and in the head, and the length of which can therefore be easily adjusted according to the thickness of the casing through which it passes.]

RE-ISSUES.

A. C. Vandyke, of Greenupsburg, Ky., for an Improvement in Heating Ores. Patented April 24, 1860:

I claim the described arrangement of the ore heater, E, gate, F, rod G, and doors, D and D', in connection with the tuunnel head, A, the whole being constructed, combined and operated in the manner and for the purposes set forth.

I also claim the open work-basket grate, E, in combination with the conical or bell-shaped open work gate, F, when used in connec-

tion with the tunnel head of a blast furnace, substantially as described.

I also claim the conical or bell-shaped open work gate, F, for the purpose of more readily diffusing the heat and gases through the ore and of discharging the ore into the furnace when heated, substantially as described.

Edward Lindner, of New York City, for an Improvement in Breech-loading Fire-arms. Patented March 29, 1859:

I claim, first, The method described for operating or closing the breech and forming a tight joint at the junction of the barrel with the breech, by the employment of a screw, ferrule or sleeve fitting an outer screw thread on the barrel, and provided with a projecting annular flange for grasping and releasing the breech and for drawing the same backwards and forwards in the direction of the barrel to or from the rear end thereof upon said screw-threaded sleeve, being operated substantially as described.

Second, I claim, in combination with a movable box within the breech, constructed and operating as described, the packing thereof by means of asbestos, or its equivalent, substantially in the manner and for the purposes described.

Third, Locking the screw-threaded sleeve that operates the breech, by forming the pivoted lever which serves to turn said sleeve with an eccentric or cam, arranged to act upon a locking pin by pressing down said lever after the breech is drawn tight, as set forth.

Edward Lindner, of New York City, for an Improvement in Breech-loading Fire-arms. Patented March 29, 1859:

I claim the employment of a hollow screw, arranged to fit the rear end of the barrel, and serving to lock and open a suitable shifting breech-piece, substantially as and for the purpose or purposes set forth.

S. J. Seely, of New York City (formerly of Buffalo, N. Y.), assignor to C. W. Durant, of New York City, for an Improvement in Railroad Cars. Patented April 24, 1860:

I claim, first, The application of corrugated metal plates combined with and secured to and upon the angle irons, a b c d, for the construction of the bodies of railroad cars and other vehicles, as set forth

Second, The application of the said corrugated metal plates and angle irons, combined with the trough irons, E, as set forth, for the purposes described.

ADDITIONAL IMPROVEMENTS.

D. F. Elmer, of Haydensville, Mass., for an Improved Watch Key and Guard Bar. Patented June 26, 1860:

I claim making that portion, f, of the slot in the sheath which provides for the longitudinal movement of the sheath upon the tube of a spiral form, substantially as and for the purpose described.

W. H. Johnson, of Richmond, Ark., for an Improvement in Plows. Patented Feb. 14, 1860:

I claim the segmental ring, D, provided with the screw threads and nuts for adjusting it in the beam, A, in combination with the share piece, E, constructed, arranged and operating substantially as and for the purposes specified.

J. B. McEnally, of Clearfield, Pa., for an Improved Paper and Letter File. Patented Feb. 28, 1860:

I claim the hollow cylinder or tube, A, provided with a bottom, a, lid, c, and land or rim, d, the latter having, in connection with the open end, b, of the cylinder, spiral edges, when said cylinder is used in connection with the link, B, and wires or rods, e, for the purpose specified.

[This invention relates to an improvement on a paper and letter file, for which Letters Patent were granted to this inventor, bearing date Feb. 28, 1860. This invention consists in having the cylinder of the file made hollow, so as to serve as a box or case to hold the wires or rods, whereby the implement is rendered much more desirable than the one previously patented.]

G. T. Parkhurst, of Baltimore, Md., for an Improvement in Lamps. Patented Sept. 13, 1859:

I claim a spring attached to the outside of the upper half of a burner, and extending each way around it from the point where it is attached, with a catch on each end, suitably shaped to fasten the glass to the burner and the two parts of the burner to each other.

I also claim the oval-shaped dome or cap made in one piece with the flooring, in combination with the partitions which divide the currents of air which flow to the wick from those which pass through the side openings between the cap or dome and the chimney.

I also claim the snuffing blade attached to the interior of the lamp and actuated by mechanism outside the same, all made substantially as described, or their mechanical equivalents, and operating in the manner set forth.

DESIGNS.

Henry Berger, of New York City, for a Design for Center Pieces.

E. A. Murdoch, of Boston, Mass., for a Design for a Lady's Hat.

Alonzo Hebbard assignor to W. Gale, Jr., and J. R. Willis), of New York City, for a Design for Spoons.

E. J. Ney, of Lowell, Mass., assignor to the Lowell Manufacturing Co., for a Design for Carpets.

G. Smith and H. Brown (assignors to North, Chase and North), of Philadelphia, Pa,, for a Design for Stoves.

G. Smith and H. Brown (assignors to Shepperd & Co.), of Philadelphia, Pa., for a Design for the Plates of a Cook's Stove.

H. G. Thompson, of New York City, assiguor to the Hartford Carpet Co., of Hartford, Conn., for a Design for Carpeting, &c. (13 cases.)

N. S. Vedder, of Troy, N. Y., assignor to J. S. & Merritt Peckham, of Utica, N. Y., for a Design for a Stove Register.

NOTE.—In the above list of claims we recognize THIRTY-SIX patents which were secured through the Scientific American Patent Agency.—EDS.

NEW BOOKS AND PERIODICALS RECEIVED.

THE ATLANTIC MONTHLY. Published by Ticknor & Fields, Boston.
An excellent number.

MOTT'S CLINIQUES. Report of Professor Valentine Mott's Surgical Cliniques in the University of New York, Session 1859-60. By Samuel Francis, Member of Dr. Mott's Surgical Staff. Published by S. S. & W. Wood, 389 Broadway, New York.

NARRATIVES AND ADVENTURES OF TRAVELERS IN AFRICA. By Charles Williams, Esq. Dick & Fitzgerald, pubishers, No. 18 Ann-street, New York.

BLACKWOOD'S MAGAZINE FOR SEPTEMBER. Re-printed by Leonard Scott & Co., 79 Fulton-street, New York.

We suppose most of our readers are aware that they can get this re-print of Blackwood with the four British Reviews (the best literature in the world) all for $10 per year.

Notes and Queries

J H. A., of N. Y.—We know of no treatise on dipping. Either of the strong acids may be used for coloring brass. Sulphuric and hydrochloric acids act slowly, but are easily managed. To give the dead or "mat" surface, nitric acid, or a mixture of nitric and sulphuric is used. Many also prefer to make a thick mixture of niter in sulphuric acid. The acids act chiefly by dissolving out the zinc from the surface of the brass. Gold is colored on the same principle.

W G. W., of Va.—We have not seen the invention to which you refer, and therefore cannot meet your question. You will learn the cost of a piston, &c., by addressing the Novelty Works, in this city.

B., of Ill.—Friction is independent of velocity in relation to distance, not in relation to time. If a hundred pound weight is dragged over an iron rail a mile long, and it takes a hundred pound weight, falling perpendicularly 1,000 feet, to overcome the friction, then it will require this weight to fall the same distance, to overcome the mile of friction, whether the rubbing body moves over it in an hour or in a minute; though, in one case, the friction would be sixty times more per minute than in the other case.

C. D., of Mass.—If gunpowder be exploded in a chamber which can resist the pressure, the pressure will be maintained provided no heat escapes. The same answer applies to gun cotton.

O. P., of S. C.—Molds for india-rubber manufacture are made of metal, plaster of Paris, &c. The rubber is pressed in when at the consistence of very thick dough. Hard rubber is sold for about $2 per pound.

J. E., of Mo.—We would prescribe an application of sand paper for the purpose of removing the glaze from your rubber belts.

T. M., of N. J.—The waxed cloth to which you refer should be of oil. We think you would find sheets of pure gutta-percha preferable.

W. F. H., of Tenn.—You "consider it a fixed fact that man must fly," and ask why he may not fly with the machine you describe, just as well as with any other.

[W. F. H. proposes to use a modified, explosive air engine, constructed of aluminum, &c.]

J. M. L., of Ind.—The bristles of brushes are arranged by careful and dexterous manipulation.

S. L. C., of Ind.—You ask: "Why is it that the earth does not perform one fourth of its revolution in the same time that it would fall to the sun, if deprived of its projectile force?" There is no reason.

G. H. H., of Maine.—Instead of .4 read .04, and your way is clear.

B. F. C., of Tenn.—Your philosophy teaches you correctly; we advise you to arm yourself with it and demolish your opponents. Tell them how a babe can move the earth, and they will be satisfied that a force of 100 pounds will move the "Great Eastern" under the circumstances you describe.

F. F., of S. C.—Creosote is extracted from coal tar and wood tar. For use in preserving wood, it is not necessary that the creosote be pure; coal tar is often used without any special preparation. It is very desirable that creosote shall be produced in some convenient form for sale and use.

W. F. C., of Md.—The "laminated" gold is gold in the shape of foil or ribbon.

H. S., of Md.—We gave the recipes with the endorsement of others. The ordinary way of depositing alloys is by means of the battery, from cyanide solutions.

W. W. B., of Mass.—Bars of soap shrink by reason of the evaporation of the water combined with the soap. You may, therefore, prevent the shrinkage by keeping the soap in a damp place.

MONEY RECEIVED

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, Oct. 6, 1860:—

J. D., of N. Y., $30; J. H. B. S., of Ga., $10; L. F. M., of N. Y., $15; E. D., of Mass., $25; F. H. P., of Conn., $25; T. E. R., of Fla., $30; S. B. S., of Ind., $30; D. G. & Co., N. Y., $40; H. P., of N. Y., $20; W. J H., of Conn., $25; J. T. W., of N. Y., $32; J. M. T., of Va., $25; I. J. S., of Va., $25; D. D., of Pa., $25; A. M., of N. Y., $30; P. H., of Mass., $50; T. S., of Ohio, $20; W. H., of Ill., $20; J. B. C., of N. Y., $20; J. B. S., of N. Y., $25; E. S., of Mass., $30; C. W., of N. Y., $30; E. C., of N. Y., $25; J. B. G., of N. Y., $55; J. B., of N. Y., $25, J. B. Van D., of N. Y., $35; H. B., of Ill., $25; J. McA., of Ill., $25; W. C., of Pa., $15; C. W. S., of Ala., $25; E. V. A., of Maine, $20; J. E. T., of La., $100; J. W. G., of Pa., $30; L. S. G., of Ky., $15; J. G., of Ohio, $30; H. W., of Pa., $20; J. R., of N. Y., $20; S. M. G., of Vt., $25; S. W. M., of N. Y., $30; J. S. B., of N. Y., $50; S. C. St J., of N. Y., $40; D. L., of Ill., $25; B. M., of N. Y., $30; J. T. P., of Conn., $30; H. P. of Ill., $30; H. H., of Va., $25; A. K. W., of Pa., $20; F. L., of N. Y., $30; W. H. L., of N. Y., $40; J. B. S., of N. Y., $25; V. V., of N. Y., $38; W. H. T., of Ohio. $25; G. & S., of Ohio, $25; J. H. K., of Mass. $25; W. J. L., of N. Y., $25 J. W. C., of Ind., $25; W. B. H., of Ga., $25; J G., of Miss., $60, S. N. D., of Mich., $30; J. W., of N. Y., $30; W. G., of Mass., $30; R. C. M., of S. C., $30; E. & G., of Mass., $30; O. S., of Mo., $25; E. L. G., of Conn., $25; J. W. of Conn., $30; G. A. C., of N. Y., $30; R. T. K., of Pa., $20; G. & S., of Mass., $25, W. P. L., of N. J., $25; R. C. B., of N. C., $30; S. I. of N. Y., $25; H. S. H., of N. Y., $25; S. T., of N. Y., $25; A. F., of N. Y., $20; J. B. S., of Conn., $23; A. A., of Conn., $30; G. W. H., of Pa., $55; J. G., of Ga., $30; J. N. N., of Pa., $35; A. A., of Vt., $30; H. N. H., of Vt., $25; R. L. U., of N. Y., $12; J. M., of N. Y., $55; S. G., of La., $35; A. R., of N. Y., $25.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Oct. 6, 1860:—

R. C., of Texas; J. H. K., of Miss.; E. L., of N. N.; F. H. P., of Conn.; W. B. H., of Ga.; J. B., of N. Y.; C. T. S., of Cal.; R. T. K., of Pa.; W. S., of N. Y.; S. M. G., of Vt; S. C. St J., of N. Y.; W. H., of Ill.; H. H., of Va.; D. G. & H., of N. Y.; V. V., of N. Y.; J. McA., of Ill.; H. B., of Ill.; A. F., of N. Y.; W. C., of Pa.; C. W. S., of Ala.; J. M. T., of Va.; G. & S., of Mass.; E. S. G., of Conn.; O. S., of Mo.; W. A. D., of Ill.; P. M., of La.; J. B. Van D., of N. Y.; H. S. H., of N. Y.; J. B. S., of Conn.. W. H. T., of Ohio. S. J., of N. Y.; J. B. G., of N, Y.; E. D., of Mass.; W. J. H., of Conn.; J. W. C., of Ind.; D. L., of Ill.; H. & K., of Ill.; H. H., of N. Y.; J. J. S., of Ga.; A. R. W., of Pa.; G. & S., of Ohio; E. C., of N. Y., L. S. G., of Ky.; D, B. B., of Pa.; W. J. L., of N. Y.; P. H., of Mass. (two cases); T. S. of Ohio; D. D., of Va.; S. & G., of N. Y.; W. P. L., of N. J.; J. B. S., of N. Y.; S, W. M., of N. Y.; G. W. H., of Pa.; A. A., of Vt.; J. N. N., of Pa.; L. G., of La.; R. L. U., of N. Y.; A. R. of N. Y.

THE GRAEFENBERG THEORY AND PRACTICE OF MEDICINE.—On the 1st day of May, 1860, the Graefenberg Company's Sales-rooms, Consulting Offices and Medical Institute were removed from No. 34 Park-row to—

No. 2 Bond-street, New York,

(first door from Broadway,) in order to afford greater facilities and a more central location, demanded by the rapid increase of confidence in the Graefenberg Theory and Practice. The Graefenberg Theory and Practice, and the use of their medicines, together with complete symptoms of all diseases incident to this country and climate, the best method for their prevention and cure, will be found in the "Graefenberg Manual of Health."

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Resident and Consulting Physician Graefenberg Co.,
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One of the leading journals says of the Graefenberg Manual of Health:—"This is the only medical book for family and general use ever published. It is written in plain language, free from scientific terms, and condenses more practical medical information than can be obtained anywhere else, unless a regular medical course of education is undergone. The popularity of this admirable and compendious work is well shown by this being the twenty-fourth edition. It contains a number of colored anatomical plates, and is a complete family physician. It is at once simple, popular, plain and explicit; and the mother, with such an adviser, is prepared at once to apply the proper remedies in case of sudden sickness in the family. In the country, a copy of the 'Manual of Health' is indispensable, and every family should possess one. It will save a hundred times its cost in doctors' bills, and, what is far better, will be the means of preserving many valuable lives to their families and relatives."

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The reputation of these governors is well established. Parties troubled with unsteady power may send for them in entire confidence. They never fail.

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I have long done with troubling my customers for certificates, but am able to refer to a large number of parties now using this governor in a majority of the States of the Union.

I will send a governor to any responsible party for trial. If it does not operate perfectly it may be returned.

A liberal discount to the trade, whose orders will always be promptly filled.

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14 tf New York City

THE BEST, AT HALF PRICE.—MOORE'S RURAL NEW-YORKER, the leading and largest circulated Agricultural, Horticultural, Literary and Family Newspaper of America (now in its XIth volume), commences a new quarter with October; hence, NOW IS THE TIME TO SUBSCRIBE. The RURAL is a large, beautiful, illustrated double quarto weekly, the favorite journal of its class, in both town and country. Only $2 a year. This quarter's 13 numbers (October to January) on trial at half price—25 cents—in specie or stamps. Address D. D. T. MOORE, Rochester, N. Y.

RURAL NEW-YORKER.—This is decidedly the best Agricultural and Family Newspaper in the world. Not a line appears in the columns of the RURAL that a parent need fear to put into the hands of his children to read. It is proudly free from all sickly sentimentalism—pure in its tone and influence; at the same time, its beautiful typography and attractively arrayed articles are calculated to make this paper a universal favorite. No deceptive advertisements are allowed to appear in its columns. If you desire an honest, faithful, reliable and INSTRUCTIVE home paper, get MOORE'S RURAL NEW-YORKER.—[Clark's School Visitor, Philadelphia. 1

PLANING MILL MACHINERY FOR SALE.—JOHN GIBSON, of Albany, N. Y., having sold the real estate occupied by his Planing and Sawmills at the above place, now offers for sale all the Machinery thereof (at low prices, and in lots to suit purchasers), viz: 1 80-horse horizontal Steam Engine; 2 Steam Boilers, 24 feet long by 4 feet diameter—2 18-inch flues each; also, 3 Steam Boilers, 22 feet long by 3 feet diameter—2 flues each; 6 superior Woodworth Planing Machines, of various sizes; 2 upright resplitting Sawmills, 1 large self-feeding circular Sawmill, for resplitting—cuts about 16 inches; 1 Crosby clapboard Saw; also, circular saw Benches, Line Shafting, 2 to 5-inch; Pulleys, 2 to 4 foot diameter; 1 screw-cutting Engine Lathe, 14 feet long—swings 25 inches; 3 double Lumber Trucks, together with all the Belting, Tools and Implements. Address JOHN GIBSON, Box No. 531 P. O., Albany, N. Y. 1*

MODEL MAKING.—A RARE OPPORTUNITY for mechanics will be found on application to the undersigned, who has a complete establishment for the making of all kinds of MODELS for the Patent Office and United States Courts. His machinery and tools are of the very best construction, and in perfect order; many of them being nearly new. He has many of the leading patentees and agencies as his constant patrons, and his orders have constantly increased, rendering the business and stand highly desirable. He is obliged to leave Washington, by reason of failing health, and invites the early attention of purchasers.

EDW'D N. SMITH, No. 451 Seventh-street,
(Directly opposite eastern portico of the U. S. Patent Office),
16 2 Washington, D. C.

TO CANDLE AND SOAP MANUFACTURERS.—Processes, with drawings, to manufacture Candles of every description—Common, Paraffine, Adamantine, French, Stearic; processes to bleach Palm Oil, and make Candles of it; recipe for every kind of Soaps—Hard, Soft, Tallow, Palm, Fancy; essays of Soaps and Greases. Address Professor H. DUSSAUCE, New Lebanon, N. Y. 1*

A COMPLETE SET OF PATENT OFFICE REPORTS from 1790. Also, Vols. IV., V., VI., VII., VIII., IX., X., XI., XIII., XIV. and XV., SCIENTIFIC AMERICAN, for sale cheap, or exchanged for an invention in the stationery line. Address WILLIAM BURNET, No. 45½ Pine-street, New York. 1*

OFFICE OF THE McNARY KNITTING MACHINE COMPANY, Sept. 20, 1860.—The Office of this company has been removed to No. 25 William-street, room No. 27, rear building. 16 2*

SOMETHING NEW.—A COUNTER SAFE, combining a metallic Money-drawer and Burglars' Alarm Lock, with 27 changes; handsomely finished. Sent to order for $5; full particulars with each Safe. Agents wanted. Send stamp for particulars. A. W. DECROW, Patentee,
1* Bangor, Maine.

STEVENSON'S JONVAL TURBINE WATER WHEELS, which gave a useful effect of .9077 per cent of the power employed at the late trial of water wheels at the Fairmount Works, Philadelphia, March 9, 1860, are manufactured solely by J. E. STEVENSON, Novelty Iron-works, New York. 16 4*

J. A. FAY & CO., WORCESTER, MASS., MAKE the iron frame Bay State planer and matcher; it has a wrought iron head, steel bearings, Fitt's patent knife-adjuster and feed works. Will surface 24 inches wide. Send for circulars. 7 2*

SOLUBLE GLASS.—FOR BUILDERS, PAINTers, calico printers and soap manufacturers. For rendering wood, cotton, &c., fire-proof; preventing soap from shrinking; also a detergent to guard against dry rot and mildew. Mixed with dolonite, it surpasses all other roofing cements. All kinds of woodwork coated with a solution of soluble glass will be fireproof. Cotton picking rooms, cotton bagging and outhouses can, by a solution of soluble glass, be saved from fire. Manufactured in a dry and liquid form by LEWIS FEUCHTWANGER & SON, No. 42 Cedar-street, New York. Constantly on hand Persian insect powder, oxyds of manganese, tin crystals, chloride of zinc. All rare metals and chemicals for pyrotechnists and calico printers; essential oils and essences. 14 5*

SAVE YOUR STEAM.—HOARD & WIGGIN'S Improved Steam Trap Valve, for relieving steam pipes, cylinders, &c., of condensed water. By its use the boiler pressure is kept up, the full heat maintained, and a large saving in fuel made. Several thousand of these trap valves are in successful use, and we offer them with entire confidence that they will accomplish all that we claim for them. For an illustrated circular of the machines, address—

J. W. HOARD, } Providence, R. I.
14 15* GEO. B. WIGGIN, }

LABORATORY OF CHEMISTRY.—CONSULTATIONS and advices on chemistry applied to arts and manufactures, agriculture, metallurgy, mining surveys. Information on chemical fabrications, with drawings, such as colors, varnishes, coal oils, paper, gas, candles, soaps, dyeing, animal black, manures, acids, alkalies, salts, india-rubber, gutta-percha, &c. Address Professor H. DUSSAUCE, chemist (from the Conservatoire Imperial of Arts and Manufactures, Paris), New Labanon, N. Y. 1*

CHARLES G. WILLCOX, MECHANICAL ENgineer, No. 135 North Third-street, Philadelphia, supplies plans of buildings with arrangement of power and machinery. Engines and machinery furnished and erected. Estimates given 14 5*

JONVAL TURBINES—THE SAME IN EVERY respect as the one illustrated on page 164 of the present volume of the SCIENTIFIC AMERICAN, and described by J. E. Stevenson, are made by the undersigned at their manufactory in Paterson, N. J. We have made and put in over 40 of these wheels, and they have given general satisfaction. We can furnish the best of references. Address W. G. & J. WATSON, Paterson, N. J. 14 5*

MACHINISTS' TOOLS FOR SALE.—TWO double-geared screw-cutting slide lathes, swinging from 20 to 24 inches and shears 12 to 16 feet long; one double-geared slide lathe, 4 feet diameter and 20 feet in length; four planing machines, various sizes; three card wheel boring machines, three card axle lathes, three shop cranes, &c., &c. All second hand; in good order. Apply to CHAS. W. COPELAND, No. 122 Broadway, New York. 14 8

CLARK'S PATENT VISE AND NICHOLSON'S metallic spirit level manufactured and for sale by W. T. NICHOLSON, No. 11 Dorrance-street, Providence, R. I. Send for circulars. 14 3*

CHESTER GUILD & SONS, MANUFACTURERS of BELTING LEATHER, 16 Blackstone-street, Boston, Mass. 14 13*

NOTICE.—WHEREAS APPLICATION HAS been made to the committee (who have advertised extensively, offering premiums for lamps designed for the burning of whale oil) asking further time for the completion of lamps for examination, therefore the committee have extended the time from August 30, 1860, to and including October 1, 1860.

JOS. GRINNELL, Chairman.

MATTHEW HOWLAND, Secretary.
New Bedford, 8th mo. 24th, 1860. 14 4*

BACK NUMBERS AND BOUND VOLUMES OF the NEW SERIES of the SCIENTIFIC AMERICAN can always be had of A. WINCH, No. 320 Chestnut-street, Philadelphia, Pa. 11 12*

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TUNGSTEN STEEL.

Franz Mayr has produced, at his cast steel works, at Kapfenburg, in Styria, cast steel of such dimensions, forms, and excellent quality, as could previously only be obtained from Krupp, of Essen. Oblique cog wheels for coining machines and locomotives, axles for railroad carriages, boiler plates, angle knees, and round, flat and quadrangular rods of various sections, have now been produced by Mayr, for more than a year.

What particularly deserves to be mentioned with regard to these articles is Mayr's unrivaled tungsten steel, distinguished by the fineness of its crystalline texture and its remarkable hardness—so much so, indeed, that the experiments made with it several months ago have shown that tools made from it for cutting toothed wheels, bores, chisels, punches, turning tools, planing blades, &c., retain their power of cutting four times as long as those made of Huntsman steel, previous regarded as the best. This steel may, therefore, be recommended for these purposes.

Tungsten has nearly the same specific gravity as gold, and this density is recognizable in the cast steel alloyed with it, by the alteration in the grain of the fractured surface, and by the hightened ring of the steel.

In hardness, metallic tungsten nearly approaches the hardest of natural bodies, and it communicates this property to cast steel, without injuring its tenacity and malleability when the addition is of 2-5 per cent.

The absolute solidity of tungsten steel exceeds that of all other known steels; for fifteen consecutive experiments with a machine, in the Polytechnic Institute or Vienna, showed the highest power of resistance to be 1,393 cwts., and the lowest 1,015 cwts., giving an average of 1,158 1-3 1-5 cwts., to the square inch; so that this steel exceeds all other kinds hitherto tried.

The ore of tungsten, from which the metal is obtained, usually occurs in company with tin stone; it has probably hitherto never obtained any technical application, the only value attached to it being as a specimen in mineralogical or geological cabinets.

More recent investigations have shown, however, that the arts may derive considerable benefit from it. One of the richest sources of this ore is possessed by the Austrian empire in the tin mines of Zinnwald, in Bohemia, where the tungsten ore has been thrown upon the heaps as worthless for nearly five hundred years.

Mayr has the great merit of having been the first to bring this new and hitherto unemployed metal into use in the manufacture of cast steel on the large scale, having introduced tungsten cast steel into commerce of the most various degrees of hardness, and of any dimensions.

The price of this steel, notwithstanding its remarkable goodness, is lower than that of the English cast steel, over which the uniformity of its crystalline texture gives it a peculiar advantage.

The above properties of density, hardness and strength are also communicated by tungsten to cast iron, and this alloy may probably be useful for crushing rollers, and may, perhaps, in time, attract the attention of the artillery.—*Mining Chronicle.*

THE PRINCE OF WALES AT THE PATENT OFFICE.

Perhaps our readers are generally aware that the Prince of Wales, the eldest son of the Queen of Great Britain and Ireland, is now making a short visit to this country. On the 4th inst. he visited the Patent Office at Washington, and. it is said, "listened patiently to long explanations of curious models." Would the inventors exchange the intellectual power of making these inventions for the political power one day to be wielded by the prince?

Marshal Vaillant has sent to the French Academy an account of an insect which amuses itself by boring holes in leaden balls.

DAYKIN'S IMPROVED WATER DRAWER.

To have pure soft water like the Croton brought into every room in one's house by means of pipes is certainly a very great convenience; but, like so many of the conveniences of modern civilization, it is sometimes very dearly purchased. The great variety in people's constitutions is shown in no one respect more strikingly than in the action of lead poison. While in some systems it is eliminated and passed off without producing any evil effect whatever, in others it slowly accumulates, till it at last makes its appearance in colic, neuralgia, paralysis and a frightful train of painful and incurable diseases. From somewhat extensive and very sad experience with various kinds of water pipes, we have come to the decision that if it was possible, we would have all our water for drinking and culinary purposes drawn from an open well with an old-fashioned bucket. Dr. Clark, the most eminent professor of medical science in the city, uses melted ice entirely for drinking, in order to avoid imbibing lead from the Croton pipes.

Fig. 1

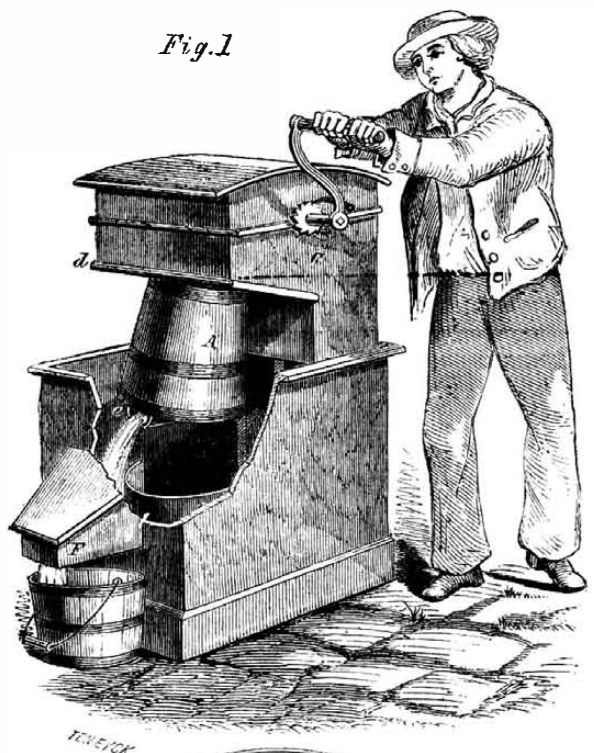

Fig. 2

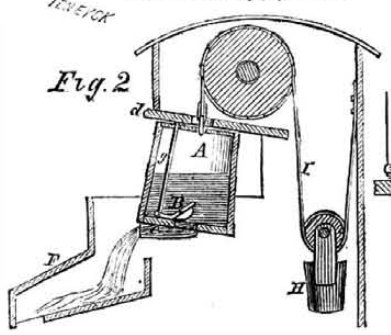

Fig. 3

DAYKIN'S IMPROVED WATER DRAWER.

With these views we naturally feel a strong interest in any improvement in buckets, and the one which we here illustrate is very manifestly calculated to make the drawing of water, by their means, more easy and convenient. It is very simple, and will be readily understood by a glance at the engraving, of which Fig. 1 is a perspective view, and Figs. 2 and 3 vertical sections of the several parts. The bucket, A, is made of the usual form with the valve, B, in the bottom. In the case or curb, C, is placed, directly over the bucket, the inclined board, *d*, so that, as the bucket rises against this board, its back edge may hit the inclined board first, when—the strain continuing to be applied to the rope—the bottom of the bucket is tipped forward in the position shown, so that the spout, *e*, may guide the water into the spout, F, of the curb. At the same time the upper end of the rod, *g*, comes in contact with the board, and opens the valve, B, in the bottom of the bucket, allowing the water to flow out. After the bucket is emptied, the weight, H, holds it suspended in contact with the the board, *d*, with the valve partly open, allowing the air to flow through and keep it dry and sweet, while the board, *d*, serves as a cover to keep out leaves, &c. The band, I, should be made of two or more ropes, with the twist running in opposite directions, forming a broad band not inclined to untwist. This band is joined to the bucket by a flat metallic plate which passes through a narrow slit in the board, *d*, thus causing the bottom of the bucket to swing always forward in just the right direction to discharge its water into the spout. F.

The patent for this invention was granted on August 21, 1860, and further information in relation to it may be obtained by addressing the inventor, James Daykin, Cleveland, Ohio.

PURIFICATION OF CASTOR OIL.—It is well known, says an English journal, that castor oil on being kept a long time, undergoes some changes. It gets thick, and rancid; at the same time acquiring an acid taste, which remains in the throat some time after the oil has been swallowed. M. Parvesi, of Turin, has found an easy means of purifying the rancid oil. He mixes 1,000 parts of oil with 25 of animal charcoal, and 10 of calcined magnesia, and leaves them together for three days at a temperature of 68° to 78° Fah., often stirring or shaking the mixture. The oil is then filtered off, and is found to be limpid, colorless, odorless, without taste, and easily soluble in alcohol. It congeals at a lower temperature than before, and is in that respect superior to the ordinary oil.

A VERY singular geological phenomenon has startled the inhabitants of Thonon. At Orcier, in the midst of the chain of mountains, the soil suddenly sunk, and a lake of considerable extent took its place. The high chestnut trees which covered the spot entirely disappeared, and, strange to say, the surface of the lake was covered with the trunks of trees which appeared to have been long under water, and of a species no longer known in those parts. A similar phenomenon we believe, occurred in California some years ago.

SPALDING & Co., of New York, the great "prepared glue" men, are said to have cleared $60,000 within a year past, on the sale of their glue, which they attribute, in the main, to the policy of extensive advertising.