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Rail-Road News.

Railroad Accidents in England.

The usual half-yearly document relative to railway accidents has been printed by order of the House of Commons. In the half year ending the 31st of December last, there were 123 persons killed and 188 injured. Nine passengers were killed and 38 injured from causes beyond their own control, 11 passengers killed and 9 injured owing to their own misconduct or want of caution; 40 servants of companies or of contractors killed and 11 injured owing to their own misconduct or want of caution; 26 trespassers and other persons, neither passengers nor servants of the company, killed and 5 injured by crossing or walking on Railways; 1 suicide. The number of passengers conveyed during the half year amounted to 41,087,919. The length of Railway opened on the 30th of June last was 6,308 miles, and on the 31st of December the length was 6,621 miles, making an increase of 313 miles.

Plank Roads in New York.

The following table shows the number of Plank Roads in the State of New York :

Name.	Opened.	Miles.
Great Western Albany,	1849	11
Fonda and Garoga,	1845	18
Fultonville and Johnstown,	1849	5
Rome and Utica,	1848	15
Utica and Burlington,	1849	5½
Rome and Oswego,	1847	60
Rome and Western,	1849	11
Rome and Taberg,	1849	9
Rome and Madison,	1849	22
Salina and Central,	1847	16
Syracuse and Manlius,	1844	8
Syracuse and Bridgeport,	1849	12
Syracuse and Oswego,	1840	32
Syracuse and Liverpool,	1849	11
Syracuse and Tully,	1848	25
Split Rock Head,	—	—
Hannibal and Oswego,	1848	11
Hannibal and Oswego,	1849	5

Total 276½ miles. The tolls which the farmers pay are not taxes, in one sense of the term—they are saved in the larger loads they are enabled to draw, the greater speed at which they are enabled to travel, the wear and tear of harness gearing and animal strength; and, finally, if it were for nothing more, than the pleasure of riding on a smooth plank road in comparison with an old corderoy one, hard-hearted must be the man who would not pay for it.

Great Steamboat Running.

The steamboat Reindeer, running between this city and Albany, has oftentimes run at the rate of 25 miles per hour. She has run from Albany to New York in 7 hours 45 minutes, and made all the landings; she is allowed to be the fastest steamboat in the world.

The growth of larch, which, it is said, is as lasting as the English oak, is much recommended by the "Builder."

AQUATIC VELOCIMETER---SHIPS' WAY MEASURER.

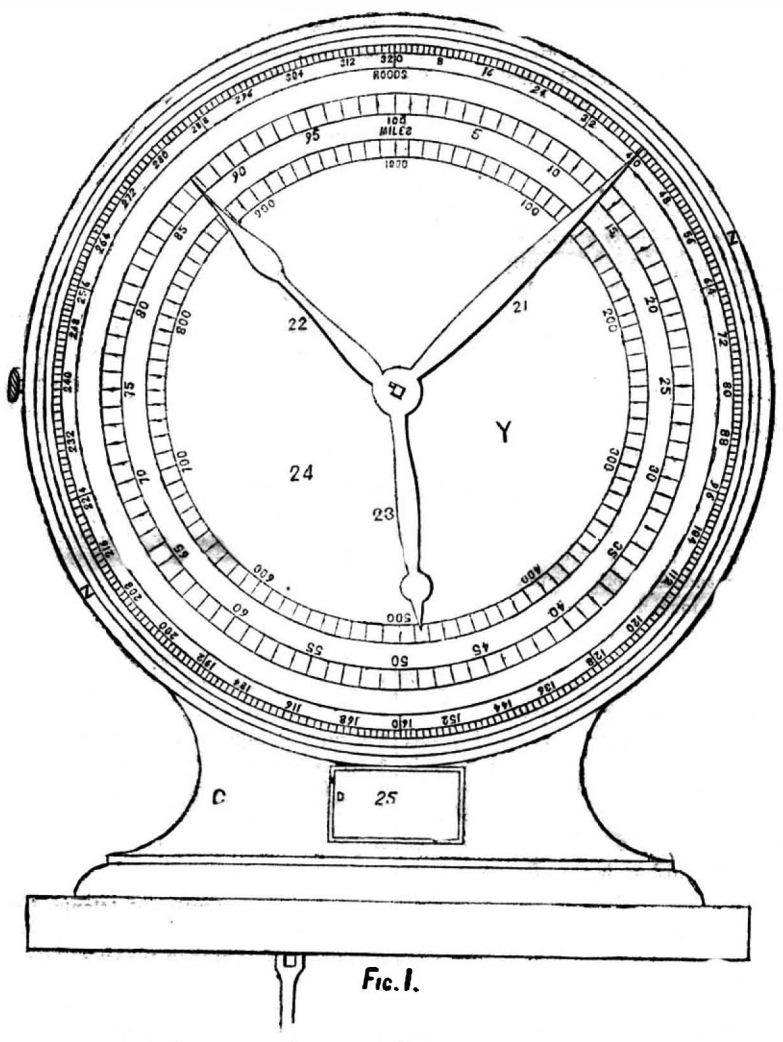
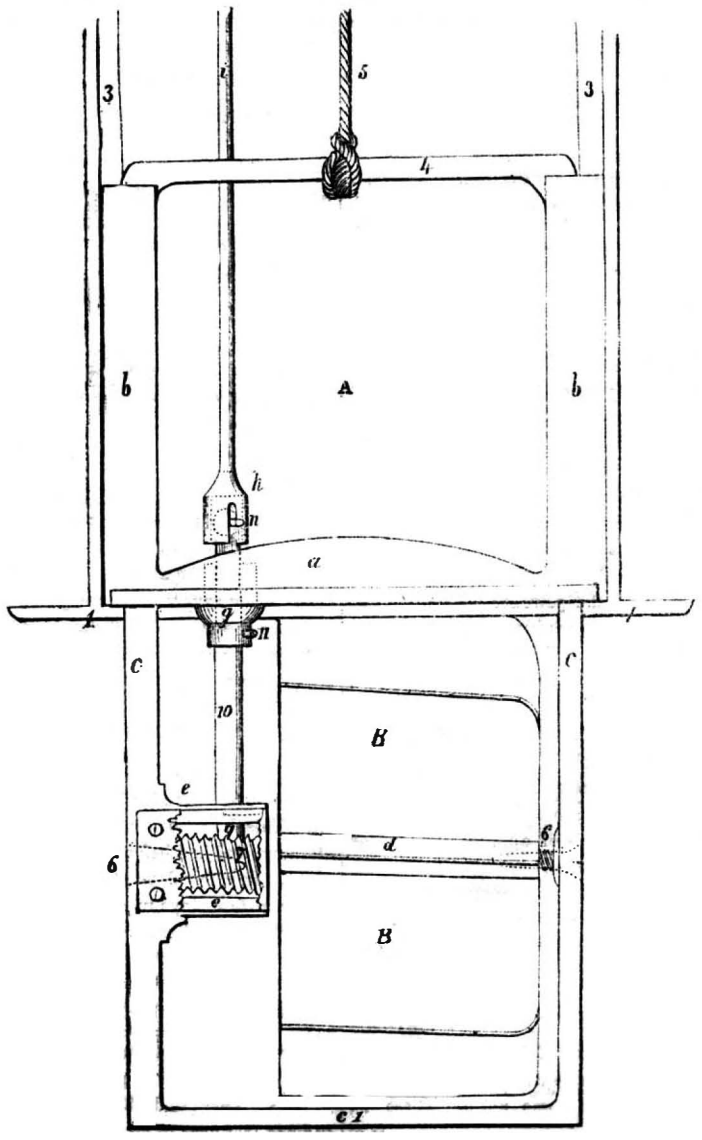


FIG. 1.



The accompanying engravings illustrate the patent granted to Mr. John R. St. John of this city, patented on the 13th of last month, and assigned to the "Trustees of the St. John's Compass and Log Manufacturing Co.," composed of James Renwick, L.L.D., Geo. F. Barnard, and Edward B. St. John, New York city. As there are a number of engravings, and as the specification is a long one, we are obliged to occupy more than one page with the subject.

The object of the invention is to denote the speed of a ship through the water, and to register the distance it has run.

Figure 1 is an elevation of the Velocimeter wheel, and a section of the pipe enclosing the connection of the recording clock-work, the registering face of which is also shown. Figure 2 is a section of the clock-work, and a side elevation of the wheel. These two figures include the connection from the Velocimeter wheel to the clock-work. The connection with the registering apparatus, and the wheel that is actuated by the water below, is represented in broken lines, so as to show the whole machinery, only leaving out, to shorten the engravings, the parts of the tube that do not require to be exhibited. Figure 2 is placed on another page along with figure 3, a front elevation of the clock-work with the disc and recording face removed. The same letters refer to like parts.

The improvements comprise—1st, the means of fixing the mechanism in place for use, and detaching the same easily for examination or repair, and for refixing again without reference to the situation of the ship. 2nd, the certainty of denoting and registering the number of miles the ship has run through the water. 3rd, the means of detaching the working parts from the Register at pleasure, so that the latter shall not operate when the ship is at anchor in a tide way. 4th, fitting the acting parts, so that they are protected from the effects of any vertical motion of the ship or water.

A is a tube, commencing from the deck or cabin, as may be desired; it is placed forward of the run, and terminates with a water-tight joint on the outside of the ship's bottom; 1 is a flange which is a seat for the circular metal plate, *a*, which prevents any indirect current passing into or out of the tube, A; it has an upper frame *b b*, with grooves, 2 2, (fig. 2), which receive ribs, 33, on each side. In the whole length of the tube, these ribs and grooves are set fore and aft of the ship, and serve to guide the apparatus into or out of the proper place for work. The cross piece, 5, on the frame, *b b*, has a rope 5, by which the whole frame is lowered and raised at pleasure. Below the orifice, the plate, *a*, has two hanging standards, *c c*, and a foot piece, *c'*; these and the frames, *b b*, are all made solid with the plate.

Between the standards, *c c*, two screw centres, 6 6 carry the ends of the principal shaft or arbor, *d*, on which are set eight paddle-blades, B B; these are placed on the shaft, *d*, not parallel with the axis, but at such an angle of deflection, in proportion to their length, that a progress of four feet, in a direct line through the water, shall give the blades, B, exactly one complete rotation and no more. At *e e* two flanches, cast solid with one of the standards, *c*, form the top and bottom of a box; this is enclosed with a strip of metal screwed on the sides of the standard, and has a hole to pass the shaft, *d*, which, within the box is fitted as a single thread worm wheel, 7, that gears into a corresponding tooth-wheel, *f*, with forty teeth set on a pivot stepped arbor, 8, in the bottom of the box, with a square,

(Continued on the Fourth Page.)

Miscellaneous.

[Special Correspondence of the Scientific American.

LONDON, May 23th, 1851.

The number of visitors to the great exhibition has regularly increased, but at no time has there been the least appearance of a crowd. The funds are quite respectable being nearly $100,000 per week. A new and very excellent plan has been projected by the executive committee, it is nothing less than a series of scientific lectures within the building. Prof. Cowper is to lecture on the section of machinery, and Prof. Ansted (the author of a very good work re-published in the United States, termed the Gold Seekers' Manual) is to lecture on minerals. Other eminent lecturers are also engaged. This is one of the most agreeable and sensible plans, to my view, yet proposed. The different departments are not yet finished, many are still fitting up, and there is still an opportunity for some of our countrymen to come forward and fill up some more of ours.

I have not heretofore said anything about the jewelry displayed, excepting the great diamond, I take great pleasure in examining the works of jewellers, and here have had a feast; never have I seen the like, never expected to see it, and never will again in all likelihood. Diamonds, emeralds, pearls, rubies &c., flash in gorgeous grandeur—what wealth is covered by Paxton's glass and iron walls.

There is one case of artificial crystals in the British department, which claims more than a passing notice. It contains imitations in crystal of all the largest diamonds in the world. The largest and most valuable of these is the ugliest and most uninviting in its appearance; it is one of the Portuguese crown jewels, and from its astounding value, which is set down at £5,644,000, it has never been entrusted to any diamond merchant to cut or polish. In size it resembles a large turkey egg, with a piece notched out of the side: it is semi-transparent on the surface, and weighs 1,680 carets. The great Russian sceptre diamond is next in point of size and value; its weight is 779 carats, and its value, being without a flaw, and of very fine water, $4,654,-000. The Great Mogul rose diamond is estimated at £632,000, and the Portuguese round brilliant, worth £369,000. Russia has also another ovoid brilliant, worth £297,000; and there is a little flat smooth-faced Persian diamond, with the fanciful name of "The Sea of Glory," set down at £34,000. There is also the great German brilliant, valued at £155,000; and another finely-cut Persian gem, called "the Mountain of Splendor," valued at £145,000. The Pigott diamond, sold by Rundell and Bridge for £30,000, is cut in very small facets, and is of an oval form. France possesses the great Pitt or Regent diamond, worth £150,000; an English gem, called the Hornby diamond, sold to Persia for £8,000, and afterwards obtained by France; and the third great French diamond is of a sky-blue color, and is estimated at £150,000.

One company, Hunt & Roskell, display diamonds enough to purchase some lines of steamships. I saw one bouquet of diamond flowers, such as anemone, rose, carnation, lily, &c., and all of them modelled from nature. The ornament is divided into seven different sprigs, on elastic stems, each perfect in design; and the complicated flowers can be separated by a mechanical contrivance. It contains 6,000 diamonds, the large ones weighing 10 carets; and it would require 1,000 of the smaller to weigh one caret. Ear-rings of diamonds, brooches, bracelets, rings, &c., such a flashing of gems is enough to turn the heads of all the lovers of trinkets in Christendom. The collection of oriental rubies is large, and some of them of great size. One of an oval shape is engraved in *intaglio*. It represents the figure of Minerva, preceded by two serpents with twisted tails, and is the work of some ingenious artist of the 15th century. The specimens of sapphire are the largest exhibited in the exhibition; one of them of a light blue steel color and of great lustre, weighs 180 grains, and another of a beautifu indigo hue, 118 grains. Many of the sapphires are set in gold swivel rings; an engraved oriental topaz is evidently a specimen of early antique cutting.

A specimen of aqua-marine is exhibited, and is said to be the largest in the world; it weighs nearly six ounces, is of a beautiful sea-green color, and extremely well cut, with seven rows of facets in front. Many of these stones of a smaller size are curiously engraved, and there are also numerous specimens of jargoons, hyacinths, chrysolites, oriental garnets, topaz, tourmaline, Mexican and Hungarian opals, and other gems, which indicate the vast extent of the collection, and the enormous sums that have been expended in bringing it together. The whole is rendered complete by the exhibition of oyster shells containing the pearls, rough diamonds from the Brazils, and similar specimens from the mines of Golconda and Borneo, which I must say look very different from the polished gems, for I would pass them by as bits of dirty glass. The wondrous powers of human art and ingenuity in working these insignificant looking pebbles, and bringing out their brilliancy and lustre, is strikingly exemplified in the contrast between the native or "rough diamond," and the highly finished and dazzling gems that adorn the regal looking coronets beside them The Good Book says, "as iron sharpeneth iron, so doth the face of man his fellow," and truly it may be said of the diamond. The dust abraded from one is employed to abrade and polish another—nothing else will do; even the friction of two rough diamonds is resorted to to get rid of the preliminary roughness on the well known principle of "diamond cut diamond." The process of polishing is then proceeded with. The diamond is firmly imbedded in a piece of metal—a circular piece of metal called the skive, is then charged with diamond powder and oil, and by steam or other power is made to revolve about 2,000 times per minute. The diamond is applied to this rapidly revolving surface, great care being used to place it at the required angle, and for every facet the diamond has to be removed, and again imbedded in the metal.

I noticed a valuable set of shirt buttons valued at $1,500 only, they were Golconda diamonds. Happy the fellow who does not scorn bone or the mother of pearl after such a sight. The jewelry in the English department is nearly all from London, but not made there. Birmington is a great place for the manufacture of cheap trinkets.

There is an interesting display of Irish, jewellery, in harps, fibulæ, and other Irish ornaments, composed almost entirely of Irish materials, including black bog oak, Irish gold, pearls, emeralds, &c., carved cups with designs from the celebrated Donnybrook Fair, bracelets, and brooches, in arbutus wood, mounted with Irish diamonds. One of the most elegant articles in this collection is a fibula of fine Irish gold set with large emeralds, with a figure of Antigone, in relief, in the centre, presented by the citizens of Dublin to Miss Helen Faucit, a celebrated living actres. The price might keep 100 from starving for a twelve month, but taste is everything.

The French department, in jewelry, displays the greatest taste and skill, at least I think so. There is displayed, a crown, sceptre and sword of State made by the jeweller who manufactured the coronation trinkets of his sable majesty, the Emperor of Hayti. The false jewelry of the French looks about as well as the genuine kind. The skill displayed in the fabrication of such things is wonderful. I at least could not tell the difference, the eye was pleased with the real and the fictitious But I must draw my letter to a close, not, however, without a few words of application like the winding up of a sermon.

I have been forcibly impressed with wha may be called a new kind of wealth, the amount of which is incalculable, and is of a kind which we do not know much about in America, I mean the wealth of jewelry. Among the nobles of Europe, at the courts and levees, the amount of jewelry displayed is wonderful, and the one who makes the greatest display makes some noise. There is, therefore, a struggle to posses noted articles of jewelry, and the stocks are of a different nature, but at the same time they are just like those of railroads or any other kind. Jewels have their value like other things, and that value is their market price. I suppose the jewelry displayed here, will amount to as high a valuation as $100,000,000. This may appear a large sum, but one single diamond, the "Mountain of Light" is estimated to be worth $15,000,000 itself. Another named the "Derri-Noor," (sea of light) is valued at $2,500,000. Here then, we have nearly eighteen million of dollars invested in two jewels, two small bits of things, both not quite the size of a decent pigeon's egg. I should like to have the price of them in available cash, if I would not build a line of steamships, that would make the world stare, then I would be willing to give my remains to the doctors.

EXCELSIOR.

Patent Case---Planing Machine.

U. S. Circuit Court.—In the United States Circuit Court at Boston, June 5th, in the case of W. W. Woodworth vs. Wm. Livingston *et al*, Judge Woodbury confirmed the report of the Master, overruling the defendants' exceptions. This was a bill in equity to restrain defendants from using the plaintiff's Planing Machine, and to compel them to account for the profits. The Master reported in favor of the plaintiff, and that the defendants pay $1 for each thousand feet of boards planed, with interest on the sum found to be due. B. R. Curtis for the plaintiff, Joel Giles for the defendants.

Improved Method of Churning.

MR. EDITOR—The ladies in this neighborhood have a mode of churning butter which I think is a superior one. They take the cream off the milk with as little of the latter as possible—put it into an ordinary churn, and to every quart of cream they put in a gallon of water (not quite blood warm), and churn it in the usual way. The butter comes sooner, is much sweeter, and keeps better. J. E. M.

Warrior Stand, Ala.

Mechanics Convention at Atlanta, Ga.

The mechanics of Georgia intend to hold a convention at Atlanta on the 4th of July next, and invite those of South Carolina to participate in the deliberations of the Mechanics' Convention at that time. The object is to consult upon the best means calculated to elevate the dignity of mechanical pursuits in Georgia, and the South generally.

American Telegraph in Sweden.

Mr. Wm. Robinson, of this country, is about to erect and manage, in Sweden and Norway, a number of lines of Magnetic Telegraph. He has been granted the privilege for the enterprise, which is to endure for fifty years; and a company, including several heavy capitalists in this city and Stockholm, has been formed under his auspices. A charter for a similar undertaking will, it is expected, be obtained from the Government of Denmark, and it is therefore probable that one of our countrymen will be the agent in establishing within the States named at least 3,000 miles of telegraph.

Colt's Repeating Fire Arms.

A case of Colt's pistols at the great exhibition attracted the attention of the British officers. They say, "these are just the kind of arms for the war in Kaffirland," and they recommend their introduction into the British army. Colt, the inventor, manufactures his pistols at Hartford, Conn., and employs 300 men now, but will soon employ 200 more.

To Cure Corns.

Pare the corn, and rub the part with sweet oil. This should be done on getting up in the morning, and just before stepping into bed at night. In a few days the pain will diminish, and in a few days more it will cease, when the nightly application may be discontinued.

Corns may be softened for paring by washing them with milk warm water in which some soda has been dissolved.

The American machine works at Springfield, Mass., have divided 33 per cent to their stockholders They sold $80,000 worth of steam engines last year to go south of New York.

Pearl Soft Soap.

It is only a few years since the process for making this elegant soap became known in France. It differs little from Toilet Soap, and owes its beautiful aspect merely to minute manipulations, about to be described. Weigh out 20 pounds of purified hog's lard on the one hand, and 10 pounds of potash lye at 36° B. on the other. Put the lard into a porcelain capsule, gently heated upon a sand-bath, stirring it constantly with a wooden spatula; and when it is half melted, and has a milky appearance, pour into it only one-half of the lye, still stirring, and keeping up the same temperature, with as little variation as possible. While the saponification advances gradually, we shall perceive, after an hour, some fat floating on the surface, like a film of oil, and at the same time the soapy granulation falling to the bottom. We must then add the second portion of the lye; whereon the granulation immediately disappears and the paste is formed. After conducting this operation during four hours, the paste becomes so stiff and compact that it cannot be stirred; and must then be lightly beaten. At this time the capsule must be transferred from the sand bath into a basin of water and allowed to cool very slowly. The soap, though completely made, has yet no pearly appearance. This physical property is developed only by pounding it strongly in a marble mortar; whereby all its particles, which seemed previously separated, combine to form a homogeneous paste. The perfume given to it is always essence of bitter almonds; on which account the soap is called almond cream, *creme d'amandes*.

Castile Soap.

Real castile soap is composed of soda 9 parts, oily fat 76·5 and water 14·5; but it is not made by these proportions of ingredients, because of the alkali employed being in an impure state. Thus supposing common barilla be used, it will in all probability require half as much weight of barilla as the fat required. For the white curd soap it may require one-third part by weight of crude alkali, and as this seldom contains more than 20 per cent. of real pure soda, it reduces the quantity of alkali in the soap, when complete, to from 6 to 10 per cent.

English Imitation of Castile Soap.

Soda 10 parts, oily fat 75, water, &c., 14·3. It is seen that this contains rather more alkali than the former.

Marine Soap.

This soap possesses the peculiar property of forming a good lather with sea water; hence its name. It is made by boiling together soda lye with cocoanut oil. It contains an immense quantity of water; its composition when complete being soda 4·5, oil 22, water 73·5 in every hundred parts.

The Sting of a Locust.

Near Westchester, Pa., last week, a young man named Hamorton. was severely stung on the hand by a young locust, in consequence of which the arm soon became much swollen up to the shoulder, attended with considerable pain. The general impression seems to be that the locust has no sting. The female, nevertheless, has a spiral sting, and some deaths have been ascribed to wounds inflicted by it.—[U. S. Gazette.

[Dr. Smith denies that locusts are in the least dangerous.

A Simple Way to Make Hydrogen Gas.

MESSRS. EDITORS—For the benefit of your numerous readers, knowing them to be scientific and practical men, I would say, a cylinder of any dimensions, made of zinc, with copper wire, well insulated, coiled loosely around it, and one end soldered to the zinc, the whole immersed in water slightly acidulated with sulphuric acid, will evolve hydrogen gas in great abundancce, which, if passed through turpentine or benzole, will burn very brilliantly,—it is a cheap expedient and easily tried.

Boston, Mass. T. B. R.

We see the mechanics of Lafayette, Ind., are making efforts to resuscitate their Institute. We say, "gentlemen, never say fail."

Woodworth Planing Machine.

In the case spoken of in our columns last week, which was recently tried at Pittsburg, Pa., Bloomer vs. McQuewan and Douglas &c. we stated that we would publish the substance of the matter elucidated in the said case. We hereby publish the charge of Judge Grier, as being the best exponent of the testimony given, and the effect it had upon the court. Before doing so, let us say that this is the most important case perhaps in which this patent has been litigated. This is not because of the parties, but the testimony. The French patents alluded to, we have seen, and they have never before, so far as we know, been brought into court, but knowing they were to be, we had a desire to know the effect they would produce, and so will hundreds of our readers; we therefore, without note or comment, request our readers to read the following charge of Judge Grier :—

Gentlemen of the Jury—As has been stated by the counsel for the plaintiff, the orders by these issues in this case were ordered by me sitting on the equity side of the court to ascertain—First, Was William Woodworth the original inventor of the machine patented by him on the 27th of Decmber, 1828? Second, Is the re-issue patent of July 8, 1845, for the same invention, intended to have been patented by the patent of December 27, 1828? This patent has been before me so often and for so long a time, that it has become stereotyped. In a recent case tried by me at Philadelphia, under the apprehension that the jury might not agree, I gave them a month to consider, but they decided the case by rendering a verdict in a day. If the same question should again arise, I would not a make a like order, because I am now perfectly satisfied.

The first question you will ask will be, what did Woodworth invent? You know that to entitle an inventor to a patent, his machine must be both new and useful. The intellectual production must differ from all others—it must have a distinctive character. It is plain and the fact is admitted that Woodworth did not invent circular cutters, rollers, nor cog work, that is the star gearing which has been spoken of—nor an endless chain—nor did he invent pressure by a spring or by levers. Did Woodworth invent the machine patented to him on the 27th of December, 1828, as it is in combination? If he did, then he is entitled to the patent—to the monoply as a reward for his discovery he was entitled to fourteen years, and in this case there have been two extensions of the patent, each for seven years, making in the whole, twenty-eight years.

Much is frequently said about the word principle, in the trial of patent actions. It may be considered as the foundation of every invention. It is, however, a slippery word—meaning the modus operandi, or mode of operation.

Have we any account of a patent, or means to effect the same object—to do the same work that is effected by the machine of Woodworth? A hundred trials have been had, including almost if not quite every circuit, but the patent has never successfully been assailed—there is no pretence that Woodworth was the inventor of the mechanical means detailed; but his claims cover a combination of tools to do the work—all the numerous attempts for a like purpose moved with the board or plank and failed to do the work—many persons came near being successful, but not one succeeded until the time of Woodworth.

The art of printing was not discovered until very recently—it was not successful until the fifteenth century. The art of printing calico preceded it, with the desire of intelligence exhibited by each generation. It may be considered remarkable. It is the same with many other inventions, which have since been added to the arts. People may be found who will swear that they know all about it, although no person can be found to corroborate such testimony. It is proper perhaps for counsel to do all that can be done, but such evidence cannot avail against the fact of invention, and the issue of a patent. In the trials which have been had in other circuits resort has been made to the inventions of Bentham, Bramah, Muir, and also Uri Emmons. In the issues the counsel have abandoned the repetition and claims of the persons named—the cheat of Emmons is palpable—he cheated Woodworth out of one half of his patent. The counsel have abandoned urging that objection.

The French patents were the only matters that I desired to hear about. They are, however, defunct things, dug out of the archives of a foreign office. Neither of them contain the elements of the Woodworth patent. The learned Professor Locke has explained to you the several devices contained in the French patents and the difference between the Woodworth cut and the cut of the French inventors. He has explained the matter fully. Woodworth invented, as I have already said, a combination of cutters and pressure rollers to effect an object—it accomplished the purpose—no man can appropriate the machine without authority. The pressure rollers in his machine may be graduated as may be desirable—the essence is to combine the whole to produce a beneficial result. The Frenchmen have been trying—but they are like Bentham and Bramah and Muir—they have done nothing.

The next question is—Is the re-issue patent of July 8, 1845 for the same invention, intentended to have been patented by the patent of December 27, 1828? If the patents were alike it would have been useless to have made the surrender. My brother Story examined the old patent, and he informed the counsel for the patent, that the ingenuity of the opponents of the patent would defeat it, if not amended. In consequence of that suggestion, it was surrendered, and a new and amended patent applied for and granted. The court has examined the old patent and finds it to be imperfect. You will ask what machine did Woodworth send to Pittsburg in 1830? Was it a vertical machine like the dry dock machine which was at work in 1828, and all the world were running to look at? or was it a horizontal machine of the same kind? The tools in the first machine were the same as at present used—they were not quite so perfect as the tools which were put in the horizontal machine. Every mechanic would see the want of such tools. The Washington witnesses, whose depositions have been read, have supposed that two patents must be alike. They have misapprehended the subject. Surely if the first patent was imperfect, he had a right to surrender it. The question, therefore, is, what kind of a machine did Woodworth invent? Did the specification attached to the patent correspond with the machine? If not, he had a right to correct it. I have very little doubt about the question, and I think that you should not. If you agree in the affirmative you will say so by adding "yes" to the first question—and the same affirmative will be added to the second question. The case, however, is with you.

The jury retired, and after an absence of ten minutes, returned into court, affirming both questions, and deciding that William Woodworth was the original inventor of the machine patented by him, December 27, 1828. And, also, that the re-issued patent of July 8, 1845, was for the same patent intended to have been patented by the patent of December 27, 1828.

Shaler & Stanton, and G. G. Sickles, of New York, counsel for plaintiff. Dunlop and Loemis counsel for defendants.

Paris Academy of Sciences.

Iodine in the Air.—M. Chatin, Professor in the School of Pharmacy at Paris, lately read a paper before the Academy of Sciences on the presence of iodine in the air, and its absorption by the system in the act of breathing. He had also detected the presence of iodine in rain and snow water.

Preserving Meat.—M. Edouard Robin addressed a communication on the advantages resulting from the use of rectified coal oil in preserving vegetable and animal substances. There were presented specimens of preserved flesh which had been kept in a bottle for a long time along with a very small quantity of the oil placed at the bottom. The evaporation of the oil, at the ordinary temperature, had sufficed to preserve the meat, notwithstanding its presence in damp air.

Inertia Momentum.

Macedon Centre, N. Y., May 7, 1851.

Messrs. Editors.—I would like, through your columns, to obtain an explanation of the following—exposing the sophistry if there is any.

Inertia is resistance to change of state. Now suppose a certain ball to be without the influence of gravity: if I move this ball it will offer resistance to the moving power. If I move it again the same distance, but do it in half the time, it will offer twice as much resistance; if in one-third the time, three times as much resistance, &c. Again, if I double the quantity of matter in the ball it will offer twice as much resistance; if I make the quantity of matter three times as great, the resistance will be three times as great, &c. Hence, inertia depends upon velocity and quantity of matter, and we have VQ=I; V representing velocity, Q quantity of matter, and I representing inertia. Now if the velocity changes the inertia changes; hence, when the velocity becomes naught the inertia becomes naught, as we then have 0Q=0; we therefore conclude that a body at rest has no inertia, and it follows that motion must be given to a body before it can give resistance; but if a body offers no resistance until after it begins to move, why does it require any force to move it—that is, to start it at first? For resistance equal to a power is essential that the power may be a power.

Again—will it be answered that it does require force to start the body and additional force to overcome the inertia? Then it must be that, to stop a moving body, we must first overcome its momentum (inertia in one form) and then we must stop the body after that.

And again, if it offers no resistance while at rest, what does the power that must be applied to move it act against? For action and re-action, always being equal and in contrary directions, there must be a re-action (or resistance) equal to the action, that the action may be an action. Whoever will satisfactorily answer these points will much oblige yours, M. C.

[It will not be difficult to expose the sophistry of the above; and here let us say that upon no one subject have we received more communications than on inertia. We have thrown the most of them into the fire, and intend that this answer will serve as a point of reference for a long time to come. As our correspondent occupies a situation in which it is absolutely necessary for him to possess correct information, in order that others may receive the same from him, respecting this great principle of Natural Philosophy, the one which lies at the root of the science of mechanics, we comply the more readily with his request.

Inertia and *resistance* are totally different principles: inertia simply means that property of matter whereby it is incapable of spontaneous change. This law of matter is evidently not understood by those who present arguments like the above; for inertia has nothing to do with velocity nor the quantity of matter. A ball of 1000 pounds is just as incapable of changing its state of motion, or rest, as one of five pounds. The velocity and the weight of a ball measures the force—the laboring force applied, and that has nothing to do with *inertia*. A body endued with inertia cannot of itself, independent of all external influence, commence to move from a state of rest; neither when moving can it arrest its progress and become quiescent. The same property by which a body is unable, by any power of its own, to pass from a state of rest to one of motion, or the contrary, renders it incapable of increasing or diminishing any motion which it may have received from an external cause. A body moving at the rate of 10 miles an hour cannot increase its speed to 11 nor change it to 9 by any energy of its own. If there was such a power in any body it would have the capacity to commence moving from a state of rest to any velocity. Inertia merely means the passive nature of matter. It is easily explained thus: "A ball shot out of a gun would continue, by the law of inertia to move forever in a straight line. The reason why this does not happen is owing to the resistance of the atmosphere and the law of gravity, which, by its magic eye, attracts everything on earth to its centre. A ball at rest will continue at rest forever, unless it receives some outward force impressed upon it." The example of the ball in the letter is not to the point, for we cannot conceive of a ball "without the influence of gravity," and how any other person can, we are unable to divine.

We do not know who would make the supposed answer put into the mouth of another, in query second of our correspondent.

In answer to query third, let us put the question as it should be, "If inertia offers no resistance, while at rest, what does the power that must be applied to move it, act against, for action and re-action are equal," &c. We hope this will make the subject clear, for the *power* to move *inertia* is nothing, and it acts against nothing. The power to move a weight is something, but the *power* is just as much *inertia* as the weight is. What is the power spoken of here to move the weight? Is it not obedient to the law of inertia, as well as the weight? Yes. But our correspondent puts the case in a totally different light. What every philosopher understands by *force*, is a a body in motion. A body at rest and another in motion are incapable of spontaneous change, therefore the difference in *inertia* between them is=0.

The language used to explain the *property* of inertia in many popular works is calculated to mislead the student. The term "*resistance* to move," is faulty. Inertia means indifference to rest or motion: it implies as strongly the absence of all resistance to the reception of motion, as the absence of all power to move itself. The term *vis inertia* (force of inactivity) used by Newton and some authors who desire to appear scientific, is wrong—it is a misnomer, as inactivity means the absence of all force.

Our correspondent's points have been correctly and satisfactorily answered to him and others, we have no doubt; and we hope those who read this will not hereafter, if they have done so before, discuss a question of the "*composition* of forces," under the name of *inertia*, as has been done in the above communication.

Converting Frigates into Steam Propellers.

Francis Grice, Esq., the Naval Constructor at the Philadelphia Station has just had completed a model of the U. S. frigate St. Lawrence, which is chiefly designed to show in what manner and how easily a steam propeller can be attached to any vessel in the navy.

The magazine is placed forward of the boiler, and is so constructed that an explosion is impossible. Pipes through which a flow of water passes are admirably arranged about the magazine, so that by turning the main cocks, the whole is submerged, and beyond the penetration of fire. This improvement was conceived by Charles W. Copeland, Chief Engineer of the United States Navy.

The coal bunkers are arranged alongside the boiler, and for a ship the size of the St. Lawrence, will carry 275 tons. The employment of men for the St. Lawrence, with the improvement of the model attached will be 80 less than now required, which, economically speaking, is worthy of consideration in these days of retrenchment and reform. The propeller is made on a scale, so that one for a full sized frigate would be twelve feet in diameter, which would propel the vessel from 7 to 8 knots per hour. The after magazine, spirit room, bread rooms and other storage rooms, are well constructed, of easy access; the pursers', engineers', and other officers' rooms are all very nicely arranged. The model has 44 guns, exactly.

The engine and boilers, take the place of the ballast usually stored in the same apartment of the vessel, and thus they have the two-fold importance of propelling the vessel and ballasting her at the same time. In order to attach the propeller, it is not required to remove the rudder. nor cut away or damage the stern post of the vessel.

New Inventions.

Improvement in Tailors' Measures.

Mr. C. S. Gates, of Morrisville, Vermont, has invented an improvement in measures for taking the dimensions and proper form of the human frame, for the purpose of cutting garments to fit the body in the most proper manner. He employs flexible moulds, having perforations and numbers in them, which, being laid upon or applied to the human body, indicate the exact points for cutting the garment to the proper shape to suit the person measured. The benefits of a flexible measurer to delineate the shape, are apparent, knowing how variously modified human frames are, and how difficult it is to fit some persons. Measures have been taken to secure a patent.

The Manufacture of Barrels by Machinery.

We perceive in great numbers of our home exchanges an article quoted from the Glasgow (Scotland) Daily Mail, describing an invention recently introduced into that city for the manufacturing of barrels by machinery. It would appear that many in our country are not aware of the existence of machinery here for manufacturing barrels from the stave—completing the barrel by continuous operation. The readers of the Scientific American, however, know this to be true. Barrel machinery is now of a somewhat old date in America. In this country, celebrated for an abundance of the finest timber, we have also the best machines for working in wood. In 1827, we think, the first patent for dressing staves by machinery was taken out by a Mr. Wm. Hale, and since that time quite a number of other machines have been invented. We have published engravings of three of them, and there are one or two in existence which we have not yet had an opportunity of illustrating.

Ships' Cable Nippers.

Mr. Robert Dixon, of Brooklyn, N. Y., has invented a new and useful contrivance for attaching the cables of ships to the messengers employed in hauling them up, for which he has taken measures to secure a patent. The nippers consist of metal jaws hinged together at one end, whereby they are easily closed and released, and in the inside the jaws have recesses, which, when they (the jaws) are closed, form openings in which the cable and messenger are held secure from dragging endwise, by knots, if the cable be of rope, or by the links of the chain. These nippers are far superior to the rope kind which are in common use.

Improved Mortising Machine.

Mr. Avery Kinney, of Homer, Cortland Co., N. Y., has invented and taken measures for securing a patent for some very valuable improvements in mortising machines. He employs two tables or bed pieces, one upon the other, the upper one, across which the boring frame travels, slides in the direction of its length over the second, it being operated by rack and pinion, and so connected and operating together as to admit of the auger being moved or set at different points on the timber without loosening the machine and re-fixing it, in the manner required by other mortising machines.

Improved Fence.

Mr. Robert McConnell, of the city of Pittsburg, Pa., has invented and taken measures to secure a patent for improvements in picket fences, whereby he unites the fence by tie rods passing through the pickets and intermediate pieces, in combination with loose swivels, so that the different sections of a picket fence can be put together in a very cheap and expeditious manner.

Endless Printing Press.

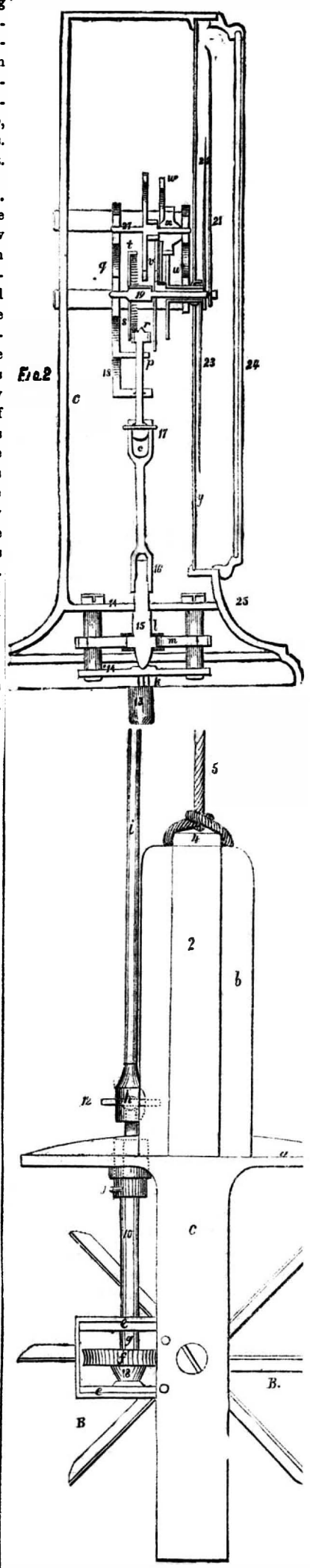
Mr. J. O. Osborne, of Akron, O., writes us he has projected a printing press, by which he thinks he shall be able to print a Bible in one second of time. The idea embraced is, to have the forms stereotyped and curved for cylinders, and to have the cylinders so duplicated as to print both sides of the paper or book at one operation.

Aquatic Velocimeter---Ships' Way Measurer.

[Continued from the First Page.]

9, on its top, taking a socket in the lower end of a short vertical arbor, 10, as shown by dotted lines in figures 1 and 2; the arbor goes through the top of the box, *e*, and through the plate, *a*, of the frame, beneath which a set collar, *g*, and pin, 11, keep the shaft, 10, from rising off the wheel, *f*: above the plate, *a*, the arbor, 10, has a pin, 12, that takes a two part slot in a socket, *h*, at the lower end of a

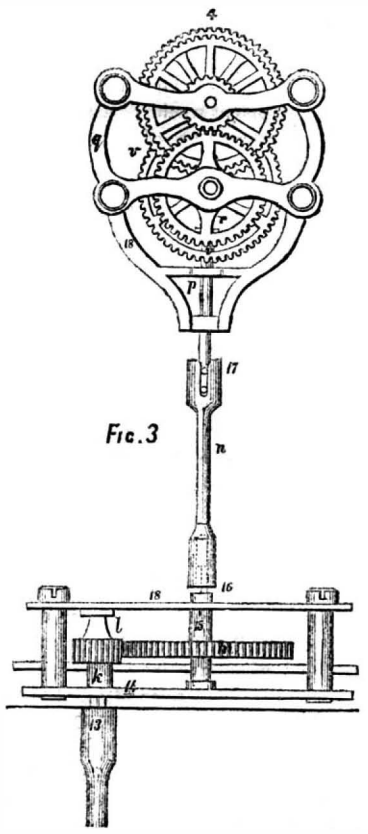
Fig. 2



vertical rod, *i*, this is prolonged up, through the tube, A, and finishes at top with a square key socket, 13, which receives the square end of a short arbor, *k*, set in a two part frame, 14 14; this is fixed in the lower part of the clock-work case.

The arbor, *k*, carries the leading pinion, *l*, of twelve teeth, this gears into a leading wheel, *m*, of sixty-six teeth, set on a spindle, 15, which goes through the upper frame plate, 14, and finishes with a short square, having a round end above it, these parts receive the socket piece, 16, of the coupling rod, *n*, fitted to the top of the spindle, 15, so that the coupling rod, *n*, may be first lifted and turned to set the register hands above, and yet not be entirely detached off the spindle, 15. The top of the rod, *n*, is formed as a ball socket, *o*, with a pin, 17, to attach or detach the lower end of the first clock-work arbor, *p*; above this the back plate, *q*, of the clock frame, is lengthened down with two bracket pieces, 18, through which the rod, *p*, passes, receiving on its top the bevelled runner pinion, *r*, of ten teeth, fitted to gear into the bevelled face wheel, *s*; this has sixty teeth, and is set on an arbor, *x*, which backs on the plate, *q*, and goes forward, carrying the next pinion, and the canon pinions and tubes between that and the face, and outside the face carries the hand, 21; this hand counts rods up to one mile; next the wheel, *s*, a pinion, 19, of eight teeth is made with the arbor, *x*, and gears into the wheel, *t*, of eighty teeth fixed on an arbor, 27, above, and carrying on the same arbor a pinion of eight teeth, that gears into a wheel, *v*, of eighty teeth, on the canon arbor, this arbor goes through the clock face, finishing just

Fig. 3



within the point of the arbor, *x*, and carries the hand, 22, which counts miles up to one hundred in number; the canon arbor is fitted with a pinion of sixteen teeth that gears into a wheel, *w*, of eighty teeth, this wheel rotates freely on the arbor, 27, with a hub that is formed as a pinion, *x*, of thirty teeth which gears into a wheel, *u*, of sixty teeth, this is set on the second canon arbor which goes through the face, just short of the first canon arbor, and carries the hand, 23, which counts tens of miles, up to one thousand miles; *y* is the dial plate, and three sets of divisions; *z* is the basil, carrying 24, the glass over the dial, and at 25 an opening and door is shown, by which the fingers can be introduced to reach the socket, 16, to set the hands in unity at the time the skip is taking a departure, and thereby avoid removing the glass and basil, and yet set the hands in unity, without touching them. The parts are shown as in a vertical metal box, placed on a pedestal, but the whole may be placed on or in a box, or frame of wood or metal as taste or convenience may dictate.

The operation and timing of the parts and the proportions of the gearing having been stated, it will be seen that forty turns of the worm, 7, will give the wheel, *f*, one turn, in one hundred and sixty feet, or thirty-three turns in one mile; the pinion, *l*, of 12 teeth going at the same speed, will give the leading wheel, of sixty-six teeth, six turns in a mile, and this giving the runner pinion, *r*, of ten teeth, the like number of turns, will give the wheel, *s*, of sixty teeth, with the arbor, *x*, and hand, 21, one entire rotation, in one mile; the pinion, 19, of eight teeth, going at the same rotation, gives the wheel, *t*, one-tenth of a rotation, and the pinion of eight teeth gearing to the wheel, *v*, of eighty teeth, gives that and the canon arbor and hand, 22, the one-hundredth part of a rotation; the pinion of sixteen teeth, gearing to the wheel, *w*, of eighty teeth, gives that the one-five-hundredth of a rotation, and this, with its hub pinion, *x*, of thirty teeth, gives the wheel, *u*, and second canon arbor, with the hand 23, the one-thousandth of a rotation for each turn of the mile wheel.

The divisions for one mile being marked as rods, give also furlongs and quarters, so that the distance run through the water can be ascertained to a fraction of a mile, if so required, by the dots between the divisions.

It will be understood that the distance run in a given time will be ascertained by comparing the hands on the dial with a clock or watch, thus practically giving the rate of the ship, in miles per hour, by mere inspection.

It is well known that many attempts have been made to apply machinery for the purpose of ascertaining the rate of speed at which a ship has moved through the water in a given time; and it is believed the best of which is known as 'Massey's Log;' this, so far as known, is a box containing machinery, which is towed through the water by the ship, and is liable to uncertainties, because a fast ship, in a short sea, will frequently jerk it out of the water, when it is in operation; the motion of the water, and of the ship, is always changing the angle of the tow line; and on hauling on board it is also liable to injury, by striking the vessel when scudding or pitching heavily; another log has been made, fitted to be placed under the counter of the ship, where it is in the eddy water the ship draws after her, and becomes uncertain in its rotation, besides being open to all the former objections, when hauling into or out of place for use; and others have been contrived in various ways; but the inventor does not know of any mechanical apparatus for ships' use that is so placed beneath the bottom of the ship as to be clear of all ordinary accidental interference, by fitting the vanes or paddle-blades, B, into a frame, constructed with grooves to slide on ribs in a tube or pipe, the bottom of which supports the frame by a bead or flanch, surrounding a disc, *a*, carrying the frame, *b*, that cuts off or prevents the effects of any vertical motion of either the ship or the water on the paddle-blades, B, to destroy the accuracy of the instrument, and fitted to act on the line of motion, so that the motive parts of the Velocimeter can be withdrawn, for any needful purpose, and again replaced for use; nor does he know of any similar instrument for these purposes, that is made to operate as a standing register of the whole distance a ship has actually run, either with or without a direct reference to time, during any portion of the distance, by the operations of the vanes or blades, B, through a rod in the tube, A, upon a registering set of clock-work wheels and hands, which the present description and engravings show as registering fractions up to one mile, and from one mile to one hundred, and thence to one thousand; so that by increasing the number of wheels and pinions, the registry may be extended to any desired distance; and the inventor does not intend to limit himself to the stated extent of the numerical registry, or to the sizes and proportions of the parts, but to vary these as may be needed; nor does he mean to be limited to the mode shown, of fitting the moving parts, but to add any mechanical means for lessening friction, and wear, whenever and wherever practical use may evince the propriety of so doing.

It will of course be understood that the motion of the ship is estimated as when moving in still water, and that any known currents are to be added, when in favor of the ship, and deducted when against her.

We hope this invention will receive the strictest attention from nautical men.

Scientific American

NEW YORK, JUNE 14, 1851.

There is Nothing New Under the Sun.

As a great general fact, no man can deny the correctness of the above language of Solomon, at least so far as it relates to the human passions and the general events of life; "we see the same scenes which our fathers have seen, and we tell the same tales which our fathers have told." Many new and grand discoveries have been made since the son of David laid the foundations of his unequalled Temple, but there is much that is incontrovertible, even when we apply his words to the inventions that are frequently brought before the public now as things supposed to be new.

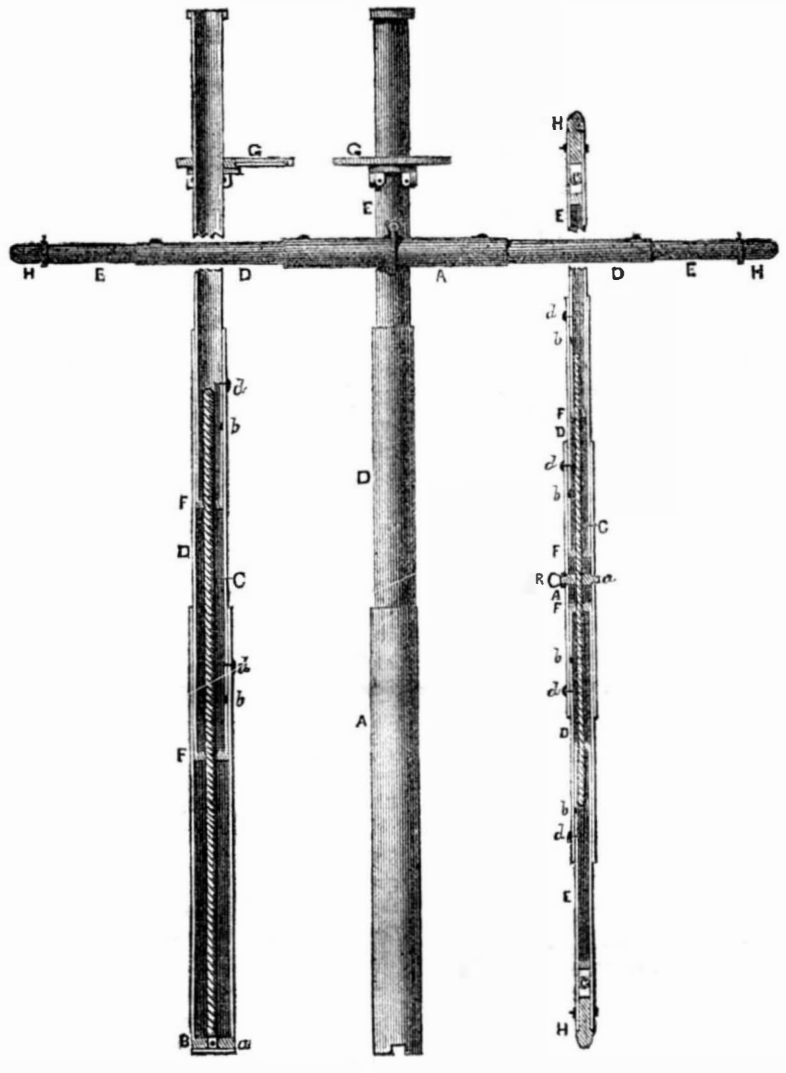
Almost every day we see something of this kind; the reason is obvious; comparatively few have had, or do have the time or opportunities of acquainting themselves properly with the history of discovery and invention. Another reason is the want of sound ideas respecting the principles of science; thus one man gets up a machine for heating apartments by compressed air, forgetting that the fuel which drives it will heat the apartment much better and at less expense without the machinery; another gets up a machine to gain power by levers, forgetting that no lever can gain power without losing speed, which amounts to no real gain—a thing well and long understood; another gets up a machine to work by centrifugal force asserting that "this is a power which costs nothing and is generally lost." Some machines are got up for speculating purposes, and many are imposed upon by them; others, and the great majority, are the productions of honest but uninformed men. The latest wonderful invention that we have seen and heard of, is a machine to gain power by centrifugal force. All machinery is just the medium of transmitting force in a certain direction or directions. One way is to transmit it in a straight and another in a curved line; but almost in every machine there is a combination of these lines. The stroke of a piston transmits the power in a straight line to work a pump, but to work a wheel the straight line is mixed with the curved line of the crank. Three revolving gear wheels, connected together, do not transmit the power in circles but in a waved line. This is the way of transmitting the power, and will easily be comprehended, but as it respects the power itself, there are some very erroneous notions abroad, and not one more so than this one of gaining power by centrifugal force. There is no power gained by machinery, but a loss in whatever amount of friction there may be in the parts. What is centrifugal force? This we will render plain in a very few words. Every body by the well known laws of mechanics has a tendency to move in a straight line, therefore, when any body receives a rotary motion, that is the force made to move in a circular direction, it is continually seeking to fly off at a tangent—in a straight line; this is called centrifugal force. It simply means that the force which has been applied, has been bent out of, and seeks for its natural line of direction; so strong is this tendency to move in a straight line in all revolving bodies, that it oftentimes acts like the blows of a hammer on large swift revolving grindstones, destroying the laws of the cohesion of particles and shattering them to pieces. Many accidents have occurred by driving grindstones, wheels, &c., at too great a velocity. The shaking of the centrifugal sugar machines, and the oscillating of large locomotive wheels, is caused by centrifugal force and is the result of driving them at too high a velocity; but to suppose that any new power is derived from such a source is all nonsense; if such were the case, all that has to be done with a steam engine, is just to put on a most tremendous fly wheel, get it up to a great speed, then put out the fires and leave the fly wheel to do the rest, like the song of the "steam arm," the machinery must go on right on forever.

We have indulged in these remarks because we know there is a positive necessity at the present time for doing so. They are intended to do good, and we have no doubt but they will accomplish the object intended.

Philip Crabbe, Esq., the first manufacturer of lead pensils by machinery, died a few days ago in London at the advanced age of 100 years.

CAPT. BROWN'S TUBULAR WROUGHT IRON EXTENSION MASTS, YARDS, AND SPARS.

Fig. 2. Fig. 1. Fig. 3.



This improvement is the invention of Captain Charles F. Brown, of Warren, Bristol Co., R. I., who has taken measures to secure a patent for the same. This invention consists in the employment of masts, yards, and other spars of wrought iron tubes fitting within one another in a manner similar to the joints of telescopes, the larger tubes forming the larger part or parts where the greatest strength is required, and the innermost or smaller tubes forming the ends, the whole number being secured together by a screwed rod or rods, made secure to the larger outside tube or tubes and passing through nuts in the inner ones. The several tubes can be set in any position by setting screws so that the length of each mast, or spar, may be varied at pleasure. Fig. 1 is an elevation of a lower mast and yard. Fig. 2 is a vertical section of the mast. Fig. 3 is a longitudinal section of the yard placed upright.

The same letters refer to like parts. A is the largest tube, and is the lowest one in the mast; in the yards it is the middle one. B, fig. 2, is a socket nut in which is secured a rod, C, with a thread on its whole length. The rod may be secured firm in its socket nut by a pin, *a*, passing through to prevent it turning round. The rod, C, in the yard, requires to proceed in both directions from the middle. D and E are inner tubes fitting into one another as represented. At the inner end of each there is a nut, F, so secured as to be incapable of turning within it. These nuts fit the rod, C, and by turning either tube, it may be screwed into or out of the other. In each encasing tube, near its end, there are one or more holes, through either of which a set screw, *d*, passes and is secured into one of a row of holes, *b*, in the tube inside of it, the said holes having threads for the reception of the screws, and by these means the length of the mast or yard may be varied; G is the round top, which may be made of wrought, or cast iron and secured to the mast in any suitable manner; H H are plugs of wood inserted in the ends of the smallest tubes, E E, fig. 3, to preserve their form and give them the required strength for the mortice to receive the sheave, C. Instead of one rod, C, in the yard, separate rods may be used for connecting each pair of tubes. The same mode of connecting the joints may be applied to the mast. The upper masts are to be made in the same way as the lower ones, and to fit into them and be secured by other screw rods secured to the upper joints of the masts immediately below them. The gradual diminution of the size of the tubes, gives the necessary taper to both the mast and yard, and each may be formed of any number of joints necessary for the purpose intended. The masts and spars, when stowed away, can be screwed into one another, or the screw rods may be taken out, and the tubes slipped into one another, thus enabling them to be stowed away in very little space. Any spars may be made in the same way. The advantages of this invention are self-evident, and we have no doubt but it will arrest the attention of nautical men. It will enable sailing vessels to be greatly increased in size, as it is difficult to obtain solid sticks for masts.

The Progress of Our Republic.

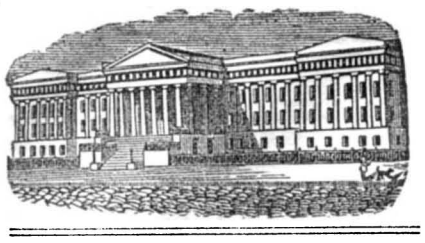
The census of the United States, for 1850, is enough to astonish all the world but ourselves—whom nothing can astonish in the way of doing up things *slick*. The increase of our wealth and population are evidences of our great prosperity. For the past eight years, especially, we have reason to be deeply thankful for the steady and prosperous advancement of our commerce, and internal resources. There have been no sudden fluctuations, and nothing but general progress. Some interests have suffered, but the Republic as a whole has not felt them. How striking the contrast between our country, and the civilized countries of Europe. Our superiority in every respect has been strikingly manifested. We have beheld Europe convulsed from centre to circumference. France has spouted out her race of monarchs and her citizens have made the streets of Paris reek with human gore. Rome cast out her spiritual ruler, who was only reinstated by the cannon of the Gaul, who, more than once, as in days of old, has become master of the Eternal City, perhaps yet to pay the debt to a more than Cæsar's vengeance. The fields of Italy have been stained with blood, and the cannon of Austria have battered on the walls of Venice. Bloody have been the struggles on the plains of Hungary, and Vienna has smoked with the ashes of the slain. Every nation in Europe but Russia and England have had the knife of civil war bared in the savage contest of father against son and brother against brother; Ireland has lost two millions by the famine and the pestilence, and what country in the old world has escaped some scourge or reverse of fortune? Not one. We have been engaged in war, and we glory not in that, because we are the friends of peace; we have also had the pestilence, but it would seem as if those things which injured and retarded the progress of other nations tended always to advance and prosper ours. Strong are we now in population, and stronger than all other nations in enterprise, and never-tiring onward pushing. In the year 1800 the population of the United States was 5,300,000; it is now 23,500,000.

The number of States then comprising the Union was sixteen; it is now thirty-one. Our territory then was 1,000,000 square miles; it is now 3,200,000. All our present domain west of the Mississippi then belonged to France and Spain, and was an unbroken wilderness. Florida was owned by Spain, and Georgia was the only State on the Gulf of Mexico. West of New York, there were no States but Kentucky and Tennessee, and these had spent most of their feeble energies in bloody strifes with a savage foe. Illinois, Indiana, Michigan, and half of our western States were yet but hunting grounds where Indians roamed unmolested. At that period the total value of all kinds of manufactures and products of industry in the United States hardly exceeded a hundred millions of dollars; the total value now of our products of industry will be about six hundred millions. The exportation of cotton alone has increased from $5,000,000 annually, to sixty-five and seventy millions.

Our inland lake trade has increased from an amount too insignificant to be estimated, to the enormous value of $200,000,000 annually. Our foreign marine is now hardly inferior in extent or value to that of Great Britain, and we are now gaining faster than ever on our gigantic rival. Fifty years ago, scarcely one of our present four thousand miles of canal existed, and not one of our present eight or ten thousand miles of railway, or our present sixteen thousand miles of telegraph were either known or dreamed of. In short, under the influence of free institutions, we have grown great and strong, with a rapidity which is enough to astonish and confound even the gigantic ambition of the Czar of all the Russians. The Emperor of Russia is called the colossus of the north; his empire is about three times the area of the United States possessions, with about three times the amount of population. It is about one-fifth greater in area than the empire of Great Britain. On the other hand, the British scepter exercises dominion over one hundred and eighty millions, three times more than Russia. It is the greatest empire at present in the world, and its industrial products are in proportion to its population. Next to England, in productive industry and commercial enterprise stands the United States, but in rapidity of advancement in giant strides to be the first empire in the world, it requires no "mystical lore" to predict that in thirty years hence, the result will be accomplished—the prediction fulfilled.

Mr. J. R. Hind has discovered another new planet in the constellation Scorpio, about eight deg. north of the ecliptic, and forming at the time an equilateral triangle with the stars Scorpio and Libra. It is of a pale bluish color, and its light is about equal to that of a star of the ninth magnitude.

The Pacific, American steamship, having made the three fastest voyages across the Atlantic, her officers are to be presented with handsome presents by Mr. Collins. Right.



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LIST OF PATENT CLAIMS
Issued from the United States Patent Office.
FOR THE WEEK ENDING JUNE 3, 1851.

To JohnC. Past, of White Haven, Pa., for improved Self-adjusting and locking Switch for Railroads.

I claim the combination of the counterpoise weights (four) or their equivalents, with the toggle levers (two) and stops, substantially as described, operating in the manner and for the purpose herein substantially set forth and made known.

To Horace S. Cook, of Leominster, Mass., (assignor to H. S. Cook and Seneca Colburn), for improvements in Comb-Cutting Machines.

I do not claim the invention of a single chisel made to operate by successive blows or cuts, each of which is in advance of another, and so as so create a series of cuts through a plate of horn or shell, such as will separate such plate into two combs, without what is termed a bottoming, that is to say, with the roots of the teeth of each of the said combs in a straight line and not in a curved line as they are when made with the "bottoming." Nor do I claim a die so made with stationary cutters, (that is to say, those which are immovable with respect to one another) and for the purpose of enabling a person by pressure of the whole series of cutters at once against a plate of horn or shell, to separate it into two combs, either with or without a bottoming; but what I claim is my improvement in comb cutting machinery, the same consisting in making the cutters to operate or move separately and independently of each other and in regular succession, in combination with making them of different and the required lengths, so as to produce the separation of two combs from a comb plate, substantially in the manner and with the bottoming to their teeth, as herein specified.

To Margaret Hulings, of Randolph Co., Ind., for improvement in hand machines for Spinning Machines.

I claim the clamp, the inclined planes (two), the lifters (two), the adjustable stop, the trip, hand and ratchet, with another hand and ratchet, combined and arranged as set forth, and described, or any analogous device for the purpose of spinning wool.

To S. B. Hutchins, of Oswegathie, N. Y., for improved arrangement of machinery for actuating the Crank Indicator.

I claim the arrangement of bevel wheels (four) and their shafts (three) herein represented and described, the first in the series being actuated by a motion derived from the eccentric by means of a crank and pin, and the last giving motion to the indicator hand, the whole being constructed in the manner and for the purposes herein set forth.

To David & Herman Wolf, of Lebanon, Pa., for improvement in Seed Distributors of Seed Planters.

We claim, in combination with the notched transverse bar, the employment of the jointed cleavers projecting from the recesses of said bar into the apertures of slide bars, for preventing the choking of the apertures.

To J. W. Briggs, of Cleveland, O., for improvement in Collars for harness.

I claim the U shaped metallic breast plate suitably padded and made to fit around the neck of the horse, the same being so limited in length, as not to reach the shoulder blades of the animal, and being suspended from the neck by a neck strap.

To Peter Claussen, of Great Charlotte st., Blackfriars, England, for improvement in processes for treating Vegetable Fibre. Ante-dated August 16, 1850.

I claim the preparation of vegetable fibre capable of being spun or felted, by submitting the plant from which the fibre is to be derived, to the action of caustic soda or other solutions of like properties, and then to that of sulphuric or sulphurous acid, in the manner set forth, whereby the gummy, glutinous, and other matters which connect the fibre with the woody portion of the plant, are dissolved and discharged; and at the same time effecting the discharge of the oleaginous and other coloring matters contained within the woody portions or straw, without staining the fibre.

Second, I claim splitting the fibres of vegetable matter, in preparing them for spinning, by the generation and liberation of carbonic acid, or other gas, within the cellular portions of said fibres, in the manner described, or in any other manner, by which gas may be generated and liberated, for the purpose set forth.

To Joseph Osborn, of Weymouth, Mass., for improved Sash Stopper.

I claim arranging a sash stopper composed of the friction plate parallel to the side of the sash, and the bolt rising obliquely upward therefrom, in the manner herein set forth, so that the upward motion of the sash will relieve the same from the frictional resistance of the friction plate, by counteracting the force of said spring; and that the downward motion tendency of the sash will augment the frictional resistance of said friction plate by aiding the force of said spring.

To Cyrus Avery, of Tunkhannock, Pa., for improvement in Horse Powers.

I claim, first, the employment of rollers (two) mounted or hung on the main shaft and lower guide shaft, in combination with the flanches on the wheels to retain said wheels upon their axles, when passing from one platform to the other, and to check their revolution as described.

[This is a good improvement of Mr. Avery, who is a veteran inventor.]

To Henry Bessemer, of Middlesex, Eng, for improvement in machines for expressing cane juice. Ante-dated Dec. 31, 1850.

I claim, first, the extraction of the juice from cane, by submitting the stalks of the same in perforated tubes or other vetsels, constructed on the principle described herein, to a continuous pressure in the manner set forth, whereby time is afforded for the juice to flow from the celullar tissues, and re-absorption into the exhausted cane is avoided.

Secondly, the perforated compressing tubes having either a straight or a tapering bore.

Thirdly, the combination of the pistons with the perforated tubes and hoppers, whereby the operations of regulating the feed, cutting the canes into equal lengths, pressing and discharging the same, are effected substantially as set forth.

To M. J. Hunt, of Rising Sun, Md., for improvement in the gearing of a Seed planter.

I claim the arrangement and combination of the double bolt with its slotted arm, rock-shaft, with its arms (two) and pitman, for the double purpose of giving motion to the feeding apparatus, and also regulating the quantity of seed to be sown, when said pitman is operated by a long crank upon which it travels, as shown.

To J. C. Dickey, of Washington, D. C., for improvement in Revolving Frames for drying fruits and other articles.

I claim the centre with three or more arms, to support a cord netting or cloth, for the purpose of exposing cloths, clothes, glue, fruits, seeds, &c., with facility to be dried, so constructed that the arms may be raised up and brought together, to expedite the collection of the articles dried, and so that it may be conveniently removed when not in use, substantially as described.

I do not intend to limit my invention to the precise form of construction described, but to vary it to suit the circumstances in which it is to be used, while I accomplish the desired object, by means substantially the same.

To R. B. Beech, of Kensington, Pa., for improvement in ornamenting baked earthen ware.

I claim, first, the application of coloring matter mixed with varnish or its equivalent, to the surface of baked earthenware, for the purpose of giving to such ware a surface of sufficient body and of sufficient brilliancy for ornamental purposes, thus obviating the necessity of the glazing process, substantially as described.

Second, the inlaying of pearls, gems, &c., on china and baked earthenware for ornamental purposes, substantially as described.

Third, the peculiar cement and process by which I affix pearls and gems to the china or baked earthenware.

To L. S. Chichester, of Williamsburgh, N. Y., for improvement in Carving Machines.

I claim the use of the pendant lever suspended from a ball and socket joint, in combination with a horizontal table for the pattern and block, the said table being affixed to the end of the pendant lever by a ball and socket joint, the whole being arranged with respect to the tracer and cutter, substantially in the manner described.

I also claim preventing the pendant lever from changing its centre of motion, or from rotating on its own axis, or on any line passing through the centre of its motion, by the use of the bent arms working in balls in spherical sockets. substantially as described.

I also claim combining with the pendant lever, two or more tables, substantially in the manner described, or in any other substantially the same, and arranged each with a tracer and cutter respectively, in order that large carvings may be obtained from a small pattern, or vice versa, or both at the same time and with the same machine, substantially as described.

DESIGNS.

To L. S. Hapgood, of Boston, Mass., for Design for Stove Plates.

To Wm. L. Sanderson, of Troy, N. Y., (assignor to R.R. Finch, of Peekskill, N. Y.), for design for Stoves

[In reference to designs, let us say, that a great deal of attention is now being paid to patenting them. The price is nothing, while the benefits derived from the patent of a good design are immense.

(For the Scientific American.)

Practical Remarks on Illuminating Gas.

[Continued from page 302.]

That water can be decomposed and resolved into its original aeriform state, is well known, and that Mr. Paine accomplishes this we have no doubt. To decompose water, however, and produce oxygen and hydrogen gases, a very large and powerful battery becomes requisite; as hydrogen has no illuminating power in itself, it therefore becomes necessary to carburet it before it can be made available for illuminating purposes. If it is allowed to pass through spirits of turpentine it must appear evident that the greater the amount of turpentine absorbed, in just such proportion will be the light produced; and from this we may deduce that, as is the carbon, so is the illuminating power.

That Mr. Paine does carburet his hydrogen by passing it through spirits of turpentine, we cannot say; I would only state what he asserts that he does. The experiment of carburetting hydrogen, by passing it through spirits of turpentine, has been tried by many practical chemists, and the results have invariably been that the carbon of the turpentine would not unite with the hydrogen, nor would the hydrogen combine with the turpentine at common temperatures; and they have also found that no signs of carbon are evinced in the hydrogen until it is brought up to a temperature when its vapors pass of, uniting with it. Mr. Paine has gone still further, and asserted what he confirms as a fact, that water is a simple element, and composed of hydrogen only, and that the oxygen which has heretofore been obtained by chemists, is produced by the imperfect decomposition of the water.

Mr. Paine's statements, although quickly repulsed by scientific persons, being considered so grossly absurd as to be unworthy of further thought, were upheld by many unacquainted with the subject, and therefore gained believers very rapidly, as do all new and novel inventions; and it would seem the more preposterous the statements by the originators of any new scheme, the more converts are gained; so craving is the public mind for new things, and so assiduously does it seek excitement. At the time the excitement produced by this novel mode of illumination was at its height, a party of scientific gentlemen of undoubted ability and veracity, from New York and Boston, waited upon Mr. Paine at his request, in order to investigate the apparatus from which this novel light from water was produced, and which had created in the minds of many people interested in gas companies and unacquainted with the principles of gases, a feeling pertaining to alarm. These gentlemen thoroughly and faithfully examined his apparatus, and in their report, which was published at the time, gave, as their decided opinion, that the gas, which was represented to be water gas, was in reality oil gas; and that the hydro-electric light was an imposition.

From that time the light appears to have been extinguished, from the public view, at least, and is now reckoned among the things that were—or rather that were supposed to have been.

Although it may seem very singular that any person should place any reliance upon a man who brings forth such an invention, substantiated by such statements, and whose whole life has been teeming with the marvellous,, still it must be admitted that many have given it countenance, and perhaps, I may say, have believed that Paine's hydro-electric light was to supersede all others. However, we see by this with what ease people who do not understand principles, are led into difficulties; and how important it is that we look into new lights thoroughly, and view them at such times when reason and judgment reign supreme, over the exciting impulses of our nature, and that we acquaint ourselves and become familiar with the first principles of all supposed luminaries, before we allow ourselves to be led away by them. The progressive march of science is ever onward, we are well aware, and new developements are made evident every day; still we do not believe, nor can we think, that science will ever recognise the method, or countenance the generating of hydrogen from water by electricity, and carburetting that material in a satisfactory manner for illuminating purposes; for where can carbon and hydrogen, the base of all illuminating gases, be obtained so easily and directly as to compete with nature, who has abundantly supplied us with a material in the form of pit coal, which for cheapness and efficacy is unsurpassed.

Having now treated upon the different kinds of gases, and the method of generating, we cannot perhaps terminate with more propriety than to append the following extract from an article which appeared in the Boston Courier some time since:

"It is somewhat strange that, at this day, when the art of gas illumination, so strictly scientific, is capable of the nicest investigations, parties are putting up works for distilling gas from grease, oil, or rosin, endeavoring to persuade those who are ignorant of the first principles of the process, that they are more economical than works designed to supply coal gas; for it is well known, both in this country and in Europe, that gas made from coal is not only much more economical, but more cleanly and free from unpleasant odor, than that made from any other material; and it really excites a smile upon the countenance of any scientific or practical man at all conversant with the process, to hear the boasting of those who vend their newly-patented, but really old exploded ideas, with regard to manufacturing gas. We esteem it a public blessing, when men of really scientific attainments devote their energies to diffuse so great a blessing as pure light, which, next to pure water, is indispensible to the natural wants and comforts of man. So simple is the process, when entrusted to the hands of scientific men, that we have no hesitation in saying that, within a very short period of time, every village in New England will have its works for the manufacture of coal gas, thus diffusing this great comfort among our whole population. Here, also, as in Europe, every cotton and woolen mill will be lighted with gas, thus adding to the comforts of the operatives, lessening the danger from fire, and increasing the profits of the owners." J. B. B.

(To be Continued.)

TO CORRESPONDENTS.

F. H. S., of Balt.—The great objection to your plan is in the use of the curb stones, which is a principal feature in it; this privilege will never be granted, as it almost embraces a question of private property.

J. O. O., of Ohio.—The same prinzeiple is embraced in what is termed Little's Double Acting Press.

S. R., of Pa.—The best way for you to bring your invention into notice is to get engravings of it published in the Sci. Am. It will soon bring you in some profits.

Z. P., of Pa.—When was the case tried respecting which you have sent us Judge Kane's charge. The particulars are not mentioned in any way, but we will use the information by-and-bye, in order to render honor to whom honor is due.

J. B. C., of Tenn.—We shall make a good use of your information.

L. B. W. S., of Ky.—The common walnut or hickory, is the tree mentioned.

J. E. M., of Ala.—A grate as nearly the same as yours, as possibly it could be, was patented to a gentleman in Troy, N. Y., three weeks ago.

H. A. L., of N. Y.—We have never seen a sofa with the same kind of arrangement you have described. We believe it to be patentable. There is certainly a great loss by the use of your steam after it has been heated to the point you describe. Then is the time it should be applied to the piston instead of letting it into the water as you describe. The way of superheating your steam appears to be good. There is two per cent. of atmospheric air in water.

W. H. R., of Geo.—You would gain nothing by your arrangement. A large sized wheel of the kind represented could never work well without being arranged upon a shaft; it would work loose. We cannot advise you to spend money upon an application for a patent. Patent Laws sent.

L. R., of Mich.—We do not think a patent could be obtained upon your plan of a wheel. The idea of keeping paddles vertical is well known, and has met with a cold shoulder from practical engineers and boat builders. All the odd numbers you ordered have been sent. $2 received.

C. W., of Pa.—If you mean the apparatus of Griffith for steam boilers, then we do recommend it.

P. M E., of N. C.—A common power loom can be worked by applying a handle to the belt pulley. No common loom could do it. It is morally impossible to answer your second question about the pressure of the water. The pressure is according to the amount of the water discharged and the velocity in a given time. You can employ cast iron for the sluices and it is good. Wooden gates, however, can be made to answer your purpose, and every good millwright should be able to construct the best kind according to the circumstances of the case. There are various ways of operating the gates. The strong screw we have always preferred, and do still prefer. If in the time of a freshet you find your dams unable to withstand the pressure, then place no dependence on your gates. Make your dam and gates strongenough to stand every pressure, or do not build them at all. The best paint to use is good white or red lead, with well boiled linseed oil. You may have good paint spoiled by using bad oil—good boiled oil is the grand secret. We do not know anything about Remington's cement; we presume it is nothing new.

C. G. P., of Wash.—Yours came too late for this present number, but it will appear next week.

L. O, of D. C.—We know of no better person to recommend you to than Capt. C. F. Loper, of Phila. Mr. Loper has the reputation of treating inventors liberally, and no doubt would accept your proposition as extended to us, if he was satisfied that your propeller will accomplish the ends that you state it will. We never engage in speculation in inventions, that course would not harmonize with the feelings of our patrons who entrust their inventions in our hands for protection. It is not right that patent agents should engage in inventions on their own account, lest they become contaminated by self-interest, and thus allow the interests of their clients to suffer.

M. C., of Ala.—We have entered your name as subscriber for another six months. We have not time to attend to your order, nor should we know where to apply for the article if we had.

J. S. S., of Miss.—Volume 5 was mailed to you in sheets on the 4th inst., and your letter forwarded to Messrs. Lerow & Blodgett for their attention.

J. T., of Phila.—We believe your plan for boring to be new and patentable, although but a brief claim could be made to the apparatus represented in the second diagram. Send on your model and we will advise you further in the matter. The expense of preparing an application for a patent for you would be $20, exclusive of government fees, which are in all cases $30.

C. B., of Mass.—Your saw filing machine we understand fully, with the exception of the means used by you to sharpen the teeth in a tapering manner according to their bevel, which you have. We have never seen a saw filing machine which would interfere with your invention in the least; we would, however, refer you to Mr. Brown's, illustrated on page 223, Vol. 4, Sci. Am. Your grooving apparatus is good.

P., of M.—We have received yours and will give it attention.

H. R. R., of Vt.—It is impossible for us to inform you at what time your application for a patent will come up for examination. Probably, however, the case will be decided upon in the course of 6 weeks or 2 months.

F. A. C. F., of Ill.—It is impossible for us to understand the operation of your printing press from a mere description. Elaborate drawings should accompany a description of such complicated machinery as a printing press.

C. F., of O.—The diagrams which you sent us certainly delineate a very novel invention. It is our opinion that a patent might be obtained for you, we could judge better on that point, however, upon receipt of one of the locks.

A. E. B., of N. Y.—You are correct about the freedom of the Woodworth machine in Canada.

J. K. H., of Ind.—A patentee can, in most cases, make any improvements in the construction of a patented machine, providing he does not change the principle of it, and still his claim will cover it; that, however, depends on the wording of the claim in his letters patent. The common saw tooth blade for cutting grass has been patented, but we believe the patent has expired.

T. H. D., of N. H.—Yours will receive attention.

J. S., of N. Y.—The air expands just to the origina bulk. It will take 1,000 lbs. pressure to heat it to the igniting point. You never can gain any benefit in the werld from compressing air for heating purposes.

A great number of correspondents are left unanswered this week for want of room. We shall endeavor to answer all next week.

Money received on account of Patent Office business since June 4:

W. A. C., of Ct., $30; T. H. D., of N. H., $25; P. D., of Pa., $20; A. K., of N. Y., $30; J. R. H., of Mass., $20; J. A. J., of Ct., $10; G. R. W., of Ct., $50; L. C., of Ct., $6; S. F., of N. Y., $10; T. M. C., of Me., $30; A. W. P., of O., $30.

Specifications and drawings of inventions belonging to parties with the following initials, have been forwarded to the Patent Office since June 4:

M. M. I., of Ga.; A. K., of N. Y.; P. D., of Pa.; J. A. J., of Ct.; G. W. L., of N. Y.; J. R. H., of Mass.; L. C., of Ct.; B. & H., of N. Y.; T. L., of N. Y.; W. B., of O.; F. J. & Co., of N. Y.

Back Numbers and Volumes.

In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:

Of Volumes 1, 2, and 3—none.

Of Volume 4, about 20 Nos., price 50 cts.

Of Volume 5, all, price, in sheets, $2; bound, $2,75.

Of Volume 6, all back Nos., at subscription price.

Scientific Museum.

Demonstration of the Rotation of the Earth.

BY PROF. HORSFORD.

In the great experiment of Foucault, the motion of the pendulum at the pole is not difficult to conceive. The plane in which oscillation takes place, not revolving with the earth in its motion from east to west, the pendulum will, at each returning sweep, approach an observer from a new point; or in other words, the plane of oscillation will revolve, and in twenty-four hours will have accomplished a revolution around the earth's axis.

The motion of the pendulum at the equator is easily presented. By the law of inertia, the absolute direction of the plane of oscillation will be, throughout the revolution of the earth, that in which the motion of the pendulum commenced. If it coincide with the equator, at the outset, it will continue to do so. If it it be at right angles to the equator, the same rule will apply. Any given direction will be maintained till the pendulum comes to rest. The plane of oscillation will not revolve around its own vertical.

The motion of the pendulum at a point between the pole and the equator, is less easily explained.

It is influenced by so many varying conditions that a strictly true mechanical conception of it may be impossible. As yet, the more gifted mathematicians have not attempted to present it in a detailed form suited to the general comprehension. While we wait for the patient and more thorough investigation, it may not be unwise to avail ourselves of such illustrations as may be approximately correct, and possibly prepare for more profound and accurate views when they shall be offered.

With these considerations the following is submitted:

The accompanying diagram represents the earth. A K is the axis; G H its equator, and D E L the meridian of latitude of Boston. B D G and B E H are two meridians of longitude 15 degrees apart, and D A and E A are tangents to these meridians, at the points D and E.

A pendulum at the pole making its first oscillation in the meridian B E H, at the end of an hour would vibrate in the meridian B D G. The plane of oscillation would in this time have swept over 15 degrees—the 24th part of 360 degrees; an angle equal to D C E, which measures the inclination of the two meridians to each other.

A pendulum at D, in the latitude of Boston, for example, oscillating in the meridian G D B, at the end of an hour would have moved with the earth in its revolution to E; but preserving the original direction of its oscillation, in would not vibrate in the meridian H E B but in the direction E F, parallel to D A.

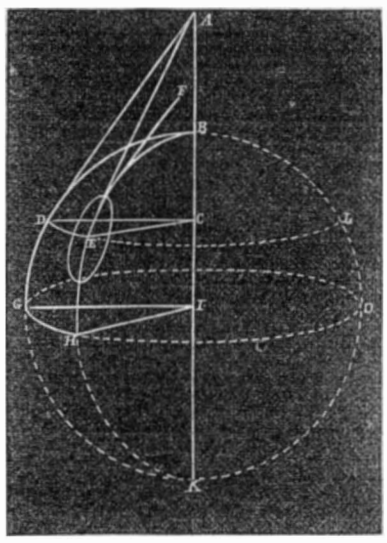
Strictly speaking this direction at the second meridian is not absolutely the initial direction. The straight lines may nevertheless be regarded as giving the sensibly correct path of the pendulum.

This direction makes with the tangent of the meridian the angle A E F—the portion of 360 degrees through which the plane of oscillation revolves in the latitude of Boston in one hour. 360 degrees, divided by this angle, will give the number of hours required for a complete revolution. If the angle be less than 15 degrees, the revolution of the plane of oscillation will require *more* than 24 hours.

Now although not strictly true, the three lines A E, A D and F E, may be regarded as lying in the same plane and the angle D A E as being therefore equal to its alternate angle A E F. But the angle D A E is less than the angle D C E, but because of the triangles D A E and D C E having the same base, D A E has the greater altitude. A E F being equal to D A E, A E F is less than D C E. But D C E is fifteen degrees, the inclination of the two meridians to each other. 360 divided by this quantity, which is less than 15, will give a quotient greater than 24.

The lower the latitude, that is, the nearer the line D E is to the equator, the less will be the angle D A E and of course the angle A E F, and the greater will be the quotient arising from the division of 360 by this angle. At the equator where the tangents to the meridian no longer converge but are parallel, the angle will be reduced to zero, and the quotient become infinity.

The path of the pendulum in latitudes between the pole and the equator may be thus illustrated:



Upon a globe a foot or more in diameter having upon it the hour parallels, small circular discs having a straight dark line through the centre (gum-tickets such as are used for price-marking by merchants, answer the purpose well) may be attached in the following manner:

In the latitude of Boston, for example, attach the first ticket with the straight line north and south. This line will represent the sensible path of a pendulum made to vibrate north and south in this latitude. Place the second ticket upon the next meridian eastward, the line upon it being parallel to that on the first ticket. This line will represent the sensible path of the pendulum at the end of the first hour's vibration. The third ticket is to be placed on the third meridian, its line being parallel to that on the second, and so on around the globe, the straight line on each succeeding ticket being parallel to that on its predecessor. The straight lines will give the path of the pendulum as it passes each succeeding meridian.

It will be observed on attaching the 24th ticket, that the line which represents the path of the pendulum at the commencement of the 24th hour of its vibration, is not parallel to that on the first ticket. The line will not have completed a revolution around its centre. Now with a pencil continue the parallel lines across the tickets already attached, each succeeding line being, as before, parallel to its predecessor, and it will be found that about twelve of the tickets, an hou. apart, will have been crossed before a north and south line will be drawn. In other words, it will appear that about 36 hours are required in this latitude for the plane of oscillation to complete a revolution about its own axis.

A large orange and wafers crossed by a straight pencil mark, may be substituted for the globe and gum-tickets, and the general illustration very well given.

[We have received a great number of communications on this subject, the majority of them against the correctness of the pendulum experiment. These, we must say, exhibit more skepticism than experimental knowledge. We have received a few able articles not denying the veracity of the pendulum experiment, but cautioning against too hasty conclusions respecting its complete and perfect demonstration of the question. One of these from A. M., Matteawan, N. Y., exhibits a very extensive acquaintance with science, and gives the details of a number of experiments made with a pendulum 11 feet, long which was made to carry a fine pencil on its lower point, so as to trace, in an easy manner, its lines of vibration on a sheet of paper. These tracings we have now before us, and they are beautiful elipsis, increasing from nearly a straight line described by the two first vibrations. He says we must beware of hasty conclusions, "as slight causes produce great deviations."

We have received a communication on the subject from Mr. John Wise, the celebrated hero of a hundred balloon ascensions. He does not controvert Foucault's deductions but counsels, like the other, caution in respect to hasty conclusions, which may be attributable to other causes than the earth's rotation. In his ascension he noticed that all bodies which he dropped gyrated, and the balloon itself partook of the same motion. In his aerial voyage, June 1841, he observed a peculiar motion in the balloon, which on a former occasion had attracted some attention. This was a pulsatory movement of the balloon while it revolved on its vertical axis. He thinks the pendulum not decisive in itself of the earth's rotation.

There is a mechanical drawback in the way of the perfect action of the pendulum, viz., the extreme difficulty of causing it to vibrate truly in one plane, so as to prevent it moving in a narrow elipse. When it moves in an elipse, the arc is considerable, as the direction of the major axis is continually changing. This is described in Herschel's Astronomy. The sources of error are numerous and not easily guarded against. To every person who has not fully examined the subject, the question at once presents itself to the mind "how can it be possible that the earth's rotation can be shown by the disc placed in the floor of a house, by a pendulum suspended above it in the roof, when the point of suspension, the floor, and the whole house revolve with the earth." This is true, but here is an experiment—it is a fact, and how is the rotation movement of the disc to be accounted for. Only for the pendulum this would not be noticed. The pendulum is the finger of the philosopher, "behold our planet wheeling on its axis." In commencing to reason on the subject, we must say, "the pendulum moves continually in the same plane, in the arc of its first vibration." If friction is left out of the question, this is supposable. If we suppose our earth to be represented by a huge ball with a horizontal spindle passing through it, and revolving in bearings, we can easily perceive, that a pendulum erected on a standard at its middle could not point out its rotary motion on a disc placed on the surface of the ball below it; but if we place the spindle of the globe vertically and put up the pendulum on its standard at the upper end, and set it vibrating over the axis of the ball, we can see at once that a disc of paper marked E. W. N. S. would show the pendulum to be describing lines N. S. E. W. during the revolution of the ball. This then, is the pendulum experiment. It is therefore clear that at the equator, the pendulum experiment cannot demonstrate the earth's rotation, and it is equally clear that at all the intermediate points between the equator and the pole, according to the latitude of the place, the pendulum experiment will exhibit more or less clearly the earth's rotation, in other words, it will take longer and longer time to show the earth's revolution, as we approach to the equator, where no revolution is exhibited.

The arrangements made for going through a series of experiments by Prof. Horsford, in the Bunker Hill Monument, are the most complete of any yet got up either in Europe or our own country. The result of these we have no doubt, will be presented through our columns, and the character and qualifications of him who superintends them, will make them a future standard of reference to all philosophers.

We perceive by our foreign exchanges, that a gentleman at Dundee, Scotland, who has tried the pendulum experiment, states that it does not show the rotation of the earth, but that it tends to the magnetic meridian. He states, also, that a scientific friend has come to a similar conclusion.

Capt. Judkins, of the steamship Asia, addressed a letter to the Liverpool Times, stating that a report had been circulated about his betting on the passage of his ship Asia which he pronounces to be without foundation.

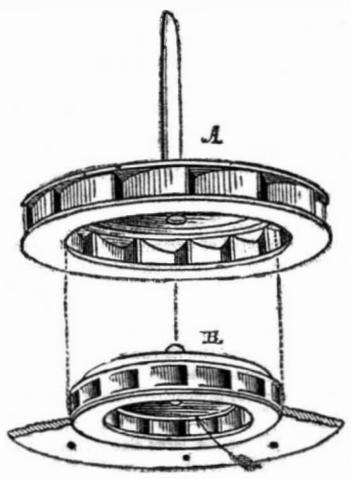
For the Scientific American.

Hydraulics.

(Continued from page 296.)

The accompanying engraving represents a wheel which has been published in the "American Miller," under the name of Henry Vandewater's Patent. Thinking that it must have some extraordinary merit to entitle it to a patent, as it has been somewhat loudly applauded, we searched for the claim and have found it to be as follows:—

FIG. 53.



"To Henry Vandewater, Philadelphia, Pa. Patented Sept. 19, 1848. (Page 1,051 Patent Office Rep., 1848; Claim 5,785).—What I claim as my invention is the entire shape, construction, and operation of the gate, with the method of moving it and regulating the supply of water by the lever, *d*." Fig. 53 is a perspective view of the wheel as it has been set before the public. A represents the buckets; B the inside of the case,—but what in this wheel enables it to go by a new name, is not easily explained. We suppose there are many wheels in our country named after this or that man who has a patent on some part connected with the wheel, but not on the wheel itself. It is not fair to blind-fold the public in respect to inventions of any kind. Here is a common re-action wheel named after an inventor who made an improvement on the *gate*.