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RAIL-ROAD NEWS.

Great Railroad Tunnel.

We see by the Cincinnatti papers that their great tunnel is advertised for letting. The hills on the north side of the city rise about 200 feet above the upper plains of the town, obstructing, except in one direction, the free access of railways to the upper part of the town. A company has been formed to tunnel the hill, for the benefit of all the railways approaching from the Ohio side. This tunnel will be 6,000 feet in length, and will have 2,000 feet of side cuttings. It is intended to lay it with four tracks, and thus provide free and safe entrance into the city for six or eight different railways, who will each contribute to its receipts, and thus make it very profitable stock. The enterprise is a great one, and will prove eminently useful.

Serious Railroad Accident.

On the 7th inst, on the Montreal Railroad, near Concord, N. H., a car coupling broke and left a car on a pile bridge, and before the accident was repaired an extra train from Dover, N. H., came up and ran into it; six were killed and sixteen dangerously wounded. Those who escaped had to jump down into the water which was fifteen feet deep. There can be no doubt but this accident occurred by bad management—recklessness.

Pneumatic Railroad.

C. Mowry, of Auburn, N. Y., has issued a card in which he states he has invented an arrangement by which the elasticity of compressed air can be used to propel carriages on railroads. The air is compressed by waterpower or otherwise, and carried in a tube or pipe the whole length of the road. He also says he has taken measures to secure a patent for the same. He perhaps thinks he has made a most wonderful discovery; it is neither new nor useful.

Steam on the Rio de la Plata.

A company has been chartered, and is now receiving stock in this city, for the purpose of establishing a line of steamers to run on the de la Plata and the tributaries. The government of Bolivia has offered $20,000 to the first steamboat that succeeds in getting up into that country; the Americans will do it.

Weaving Wire Lace.

The Birmingham (Eng.) electro-plating manufacturers have employed the Nottingham lace weavers to weave lace designs in wire, for electrotyping on plate. The invention is new, beautiful, and ingenious.

The next balloonist that appears in public should be requested to make a journey to the arctic regions in search of Sir J. Franklin; the road is straight over our continent. This would be a capital way to go in search of the N. W. passage.

Steam machinery is now employed for the transhipment of coal at the wharves in Philadelphia, it saves 15 cents per ton.

FRENCH PORTABLE STEAM ENGINE.

Figure 1.

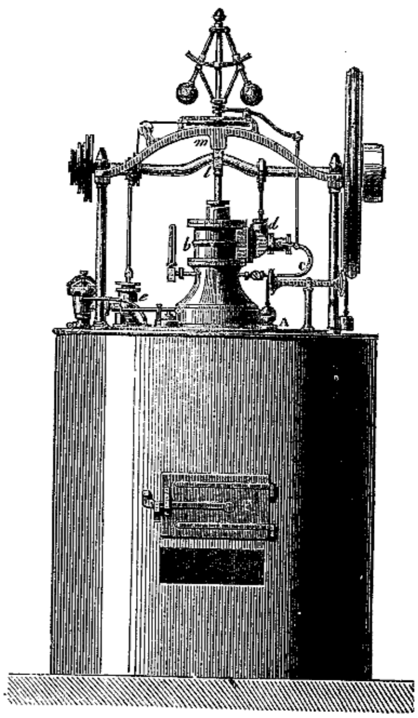
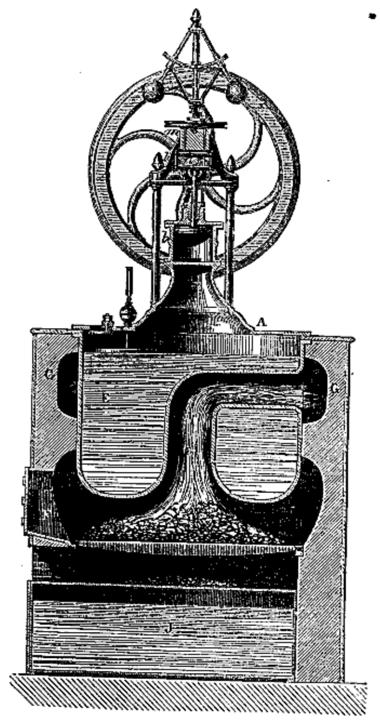


Figure 2.



Steam engine makers have been occupied for the last five or six years in discovering plans for manufacturing steam engines (or steam motors) which shall unite in themselves, the advantage of being easily moved from place to place, and be capable of giving sufficient power for the light work of an ordinary machinist. This is why that, at the Exhibition at London a large number of machines of this kind were exhibited.

In France, as in England and America, many ingenious machinists have tasked themselves to construct small engines with the machinery so simplified as to render them light and easy of transportation.

Various machines of this kind have been invented; the engine being generally (though not always) separated.

Having thus premised and shown that it is essential to procure a small engine which will occupy but little space, and may be easily moved from place to place, we will describe the portable engine of Mons. Rennes, an ingenious machinist of Paris, France:—

Figure 1 is an outside elevation, and fig. 2 is a transverse section. The same letters refer to like parts. First—The entire machine, including its boiler, occupies no more room than an ordinary turning lathe. Second—It is as easy put together as an ordinary stove, and in many instances may be made to answer the purpose of a stove. It will be easy to see by the engravings that this engine is mounted upon the upper surface or cover, A, of the boiler, E, from which the steam is conveyed at once into the cylinder, *b*, by the tube or conduit, C, which adapts itself to the box, *d*, which is cast with this cylinder.

By this arrangement the inventor says he obtains, in the cylinder, a pressure nearly equal to that in the boiler, owing to their near vicinity, and, as a consequence, produces a certain economy in fuel, by avoiding condensation and a consequent diminution of the pressure. The boiler, E, placed under the machine, is of the greatest simplicity of construction. The furnace is constructed in the interior of the boiler, in such a manner as to cause the boiler to receive nearly all the heat generated by the fire. The smoke, upon leaving the fire, passes around the boiler by two flues, G (the openings to which are within the furnace), and unite in a common chimney. This chimney may be a common stovepipe, adapted to the size of the machine, and made to answer the purpose of warming the shop in which the engine is employed.

The whole of this apparatus rests upon a foundation of bricks, enclosed by a casing of sheet-iron. Under the fire, and in the interior of the furnace, is placed a reservoir, J, from which the boiler obtains its supply of water.

It will be seen that a machine of this kind may easily be constructed from a one man power to a two-horse power—may be made to turn a heavy piece of machinery or a child's plaything, and may be put up, raised, or shifted from place to place, without altering any arrangement connected with it when it was placed in its first position.

The upper surface of the boiler, the cover, A, supports the various machinery and safety apparatus necessary to the propulsion, such as the float, level, safety-valve, alarm whistle, and steam gauge.

The engravings suppose that the supply pump, *e*, is connected with the surface of the boiler, and the rod connected with a bowed shaft, *l*, which gives motion to the slide valve. This arrangement is economical, because it dispenses with not only the handle, but also several pieces which usually serve to work the cut-off, &c.

The engine is direct-acting, the piston rod being connected to the double crank in the middle of the shaft, *l*. The slide valve is worked by an eccentric on this shaft, which has its bearings in the side supports which are braced together by the transverse beam, *m*. It is a very compact engine in every respect, and the power can be carried off and applied to drive other machinery by belts from pulleys on the bowed shaft.

We have translated this from "Le Genie Industriel," of Paris, with some slight alterations to render the matter more clear to our readers. It resembles, in a measure, the portable engine of Hoard & Bradford, of Watertown, N. Y., and is something like the one of Charles Mann, of Troy, N. Y. Portable steam engines, we know, interest a large class of our readers, and also a very large proportion of our citizens who are not readers but should be, if they consulted their own interests.

Adjustment of Compasses in Iron Vessels.

Mr. John Gray, of Liverpool, has published a letter, in which he proves, by the example of the Sarah Sands, that the compass can be as accurately adjusted in iron vessels as in those of wood. He says:—This steamship has been a most valuable agent for the determination of a mooted point now being investigated, whether iron ships undergo a very important change after crossing the Equator or not. For years I have entertained the opinion that, for all practical purposes, the adjustment on Professor Airy's principle will answer equally well in both north and south latitudes, and which this vessel has demonstrated beyond all doubt. Simultaneous bearings were taken by Captain Thompson, and his chief-officers, in various parts of the Straits of Magellan, and the result clearly showed that no deviation whatever took place.

Antidote for Corrosive Sublimate.

The proto-sulphuret of iron, a very inactive substance, has the property of decomposing immediately the deuto-chloride of mercury, and producing a proto-chloride of iron, and a bi-sulphur of mercury, both entirely harmless compounds.

Tooth Powder.

Sifted white sugar, 8 parts; finely ground charcoal, 8 parts; quinquina (bark) powder, 4 parts; cream of tartar 1½ parts; cinnamon 1-3 part.

MISCELLANEOUS.

Fair of the American Institute.

At the time of going to press the articles and machines are not properly regulated, although this should have been done before the Fair was opened. There are so many who delay bringing their articles and machines until the Fair is opened for about a week, that, according to the way the Fair has always been managed by the Institute, no person in New York expects to see things properly arranged until it has been open for two weeks at least.

The entrance on the bridge to the Battery is lined, as usual, with "Agricultural Implements," such as plows, straw cutters, reapers, corn shellers, threshers, &c. Among the plows is one made entirely of wrought-iron, by R. Pettigrew, of New York city; it is, in every respect, the well-known "Scotch Plow," the manufacture of which has been transferred to our city from across the water. These are good plows, but much heavier than neat American plows. Prouty & Mears, of Boston, exhibit good plows, very neat, and well made. As more agricultural implements appear to arrive daily, we must defer further remarks for another week.

Leather.—The display of leather this year is excellent, but, considering the greatness of this manufacture in the United States, it is but small. The Waterbury Leather Manufacturing Company, Connecticut, exhibit beautiful bookbinders' fancy leather, of every color and quality. Leather will receive more of our attention.

Meat Biscuit.—Mr. Gail Borden, Jr., exexhibits some of his excellent Meat Biscuit and Beef Lard. This article of food was esteemed by a Committe at the Worlds' Fair, composed of eminent chemists, one of the greatest and most beneficial of modern inventions. It was made the special subject of a lecture, and received a counsel medal. This American article of food for travellers and sea voyagers is one of the best discoveries of modern times. One pound of it contains the nutriment of 8 lbs. of beef, and it will keep sweet and good for a long time. The *beef-lard* is an article as beautiful in color as our finest butter, and for many purposes is better than lard. Our housewives do not yet know its real value for the purpose of cooking.

Gold Quartz.—Some very beautiful spemens of gold quartz, from California, is exhibited in the inside of the rotunda, near the left hand entrance. How the gold and quartz came to be so intimately blended, are questions for the geologist, the great question with the miner is, how to separate them in the best and cheapest manner. There is a quartz crusher and amalgamator in the machine room; it consists of common stampers, and large inclined basins with a ball in each for reducing the quartz to powder, and amalgamating the gold with the quicksilver. The inventor is H. Berdan, of N. Y.; his card states, "this machine obviates the great difficulty heretofore experienced in reducing quartz to an impalpable powder and bringing the flour of gold in contact with the quicksilver—patent applied for. He is perhaps not aware that Mr. Cochran has obtained a patent for an improvement in ball crushers and pulverizers which accomplishes the same objects.

There is another quartz crusher near this, which consists of a number of wheels revolving in a circular track; this machine is not new in principle or action. An engraving of "Rowe's Pulverizing Ore Mill," on page 81, Vol. 3, Scientific American, represents this machine exactly. It is a simple and good machine, however, and well worthy of attention. A. B. Allen, & Co., Water st., this city, were agents for Mr. Rowe the patentee.

Railroad Improvements.—The show of inventions relating to railroads, is most imposing, numerous, and attractive, nothing like it was ever seen before. The prizes offered by Mr. Ray, has been the means of calling out this array of inventive genius. Railroad car seats are numerous, and some of them excellent and beautiful. Car ventilators are numerous, that of P. O'Neil, of Brooklyn, for distributing the air by mechanical pressure to each seat in a car, is an excellent invention. Mr. Paines' car and some others are conspicuous objects. A model railroad car made of sheet-iron by Thos. E. Warren, Esq., of Troy, is one of the best railroad improvements on exhibition, but as it is our intention to devote considerable space next week to the railroad inventions on exhibition, we will say no more on the subject at present.

Owing to want of completeness in arrangement we cannot say so much about the fair as we could have wished in this number, Scientific American; next week we will make up our lee way. The Institute should enforce a rule to make every exhibitor have a written or printed description of his machine or article attached to the same; exhibitors themselves do not know how much they lose by not having such placards attached to their articles.—[*To be continued.*

Liebig on the Fermentation of Wine and Beer.

The application of our knowledge respecting the phenomena attendant upon decay, to the manufacture of beer and wine, is easy and obvious. The property of beer and wine to be converted into vinegar when in contact with the air, depends invariably upon the presence of foreign matters which transmit their own inherent aptitude to absorb oxygen to the particles of alcohol in contact with them. By removing completely all such substances from wine and beer, these lose altogether the property of acidifying, or of being converted into vinegar.

In the juice of grapes poor in sugar there remains, after the completion of the process of fermentation—that is, after the resolution of the sugar into carbonic acid and alcohol—a considerable amount of nitrogenous constituents retaining the same properties which they possessed in the juice previous to fermentation. This does not happen with the juice of the grapes of southern climates. These grapes are rich in sugar, and a considerable amount of this substance remains undecomposed after all nitrogenous matters have completely separated in an insoluble state, as yeast. Such wines alter very little when exposed to the air; the red wines of this kind, however, acidify because their coloring matter is of ready mutability, and performs, when in contact with the air, the part of the nitrogenous constituents.

The nitrogenous constituents of the grape-juice which remain in wine, after fermentation, are those ferments or exciters of fermentation in the sugar, of which I have already spoken in other letters. After the complete transformation of the sugar, they exercise upon the alcohol exactly the same effect as the decaying wood—they are the exciting causes of the ensuing process of acidification.

The affinity of these substances for oxygen is very powerful; during the short space of time necessary to transfer wine from one cask into another, they absorb oxygen from the air, and induce a state of acidity in the wine, which goes on irresistibly if it be not checked by artificial means. It is well known that this check is practically effected by sulphuration. A piece of sulphur is burned in the cask destined to receive the wine, the contained air is thus deprived of its oxygen, and an amount of sulphurous acid is formed equal to the volume of the oxygen. This newly formed sulphurous acid is rapidly absorbed by the moist internal surface of the cask. Sulphurous acid possesses a stronger affinity for oxygen than the exciters of acidification in the wine. The acid is gradually diffused from the internal surface of the cask through the wine, and withdraws from those substances, as well as from the wine itself, all the oxygen they have absorbed from the atmosphere, and thus reconverts the wine into the state in which it existed previously to being transferred into the new cask. The sulphurous acid in this process becomes converted into sulphuric acid, and exists as such in the wine.

When the wine is stored up in casks to ripen, a constant, although very slow, diffusion of air takes place through the pores of the wood, or, what comes to the same thing, the wine is incessantly in contact with a minute amount of oxygen; by means of which, after the lapse of a certain time, the entire quantity of the exciters of acidification, that is, the nitrogenous substances present in the wine, oxidize and separate in the form of a sediment or dregs, termed under yeast or sedimentary yeast.

The separation of yeast from wine or beer, during the fermentation of grape-juice, or of worts, takes place in consequence of the absorption of oxygen, or in other words, is a process of oxidation, occurring in the fermenting liquid. The nitrogenous constituent of barley is in its primary state insoluble in water, but in the process of malting, or whilst the grain is germinating, it becomes soluble in water, it assumes the same condition or nature which belongs to the nitrogenous constituents of grape-juice originally.

Both these substances lose their solubility in wine or in beer, by absorbing oxygen.—According to analyses in which we may confide, made with regard to this point, wine-yeast and beer-yeast are far richer in oxygen than the nitrogenous substances from which they are derived.

As long as any particles of sugar, in a state of fermentation, are present in the fluid together with these nitrogenous matters, the fluid itself supplies the oxygen required for their transformation into yeast by the decomposition of a small amount of the sugar or of water. This oxidizing process within the fluid itself, which causes the nitrogenous constituents to become insoluble, ceases with the disappearance of the sugar; but it is renewed if the fluid is reconverted into a fermenting state, by the addition of new portions of sugar, and it ensues also when the surface of the fluid is exposed to the free access of the atmosphere. In the latter case the separation of the nitrogenous constituents is effected by the atmospheric oxygen, and is thus a consequence of their decay or slow combustion.

I have already stated that the presence of nitrogenous matters in alcohol, causes the transformation of the alcohol into acetic acid when there is a sufficient supply of air; now it is owing to their inequalities in their relative affinities for oxygen, that during the maturation of wine in the storehouse, when the access of air is extremely limited, that the nitrogenous substances alone oxidize, and not the alcohol. In open vessels, under these circumstances, the wine would become converted into vinegar.

The preceding remarks render it obvious that if we possessed any means of preventing the transformation of alcohol into acetic acid we should be able to preserve wine and beer for an unlimited period, and to bring those liquors into a state of perfect maturity; for, under such circumstances, all those substances which cause wine and beer to acidify would become insoluble by combining with oxygen, and separate from the liquid, and with their perfect removal the alcohol present would altogether lose the property of absorbing oxygen.

Experimental art has discovered a means of accomplishing this purpose perfectly. It consists in keeping the fluid at a low temperature when undergoing fermentation. The method, based upon this principle, and employed in Bavaria, is one which the most perfect theory could scarcely have surpassed in certainty and simplicity, and it seems impossible to devise one more in accordance with science.

The transformation of alcohol into acetic acid by contact with a substance in a state of decay occurs most rapidly at a temperature of 95° Fahrenheit. At lower temperatures the affinity of alcohol for oxygen decreases, and at from 46° to 50° Fahrenheit no combination with oxygen takes place under these circumstances, whilst the tendency of nitrogenous substances to absorb oxygen at this low temperature is scarcely diminished in any perceptible degree.

It is, therefore, obvious, that if wort be fermented in wide, open, and shallow vessels, as is done in Bavaria, which afford free and unlimited access to the atmospheric oxygen, and this in a situation where the temperature does not exceed 46° to 50° Fahrenheit, a separation of the nitrogenous constituents, *i. e.*, the exciters of acidification, takes place simultaneously on the surface, and within the whole body of the liquid. The clearing of the beer is the sign by which it is known that these matters are separated. A more or less perfectly complete removal of these nitrogenous substances, however, according to this method of fermentation, depends upon the skill and experience of the brewer. It may be easily conceived that an absolutely perfect separation of them is attained only in rare and extremely happy instances. Nevertheless, the beer obtained in this manner is invariably far superior in quality and stability to that brewed according to the common method.

The exceedingly favorable influence which the adoption of this principle must exercise upon the manufacture of wine is indisputable. It is too evident to admit of a doubt that it will lead to the adoption of a more rational method than has hitherto been employed.

Wine prepared by this method will, of course, bear the same relation to the wine prepared in the ordinary way, that Bavarian beer bears to common beer, in the fabrication of which the same amount of malt and hops has been employed. In the shortest possible time, the same quality, the same maturity may be attained by the wine which, under ordinary circumstances would result, only after long and protracted storing. It is be borne in mind that the period for the manufacture of wine is the end of October, just at the cool season which is peculiarly favorable to the fermentation of beer, and that no other conditions are necessary to the vinous fermentation than a cool cellar, and open, wide fermenting vessels, and further, that under all circumstances the danger of acidification is much less with wine than with beer, it is evident that the best success may confidently be expected from the application of this method.

It must not be forgotten, that wine contains a much smaller proportion of nitrogenous matters after fermentation, than beer-worts, and that a much more limited access of air is required for its complete oxidation and separation in an insoluble form. The method employed at most places on the Rhine proceeds upon principles the very reverse of this.—The wine is left to ferment, not in cool cellars, but in rooms, situate much too high and too warm; the access of air is completely precluded during the process of fermentation by tin-plate tubes, confined with water. These tubes certainly exercise an injurious effect upon the quality of the wine; they are, in every respect, futile—the invention of some idle brain; they serve no object, and yet they are used by people who imitate others, without assigning any reason for doing so.

Appropriation of American Discoveries by the English Admiralty.

The name of Henry Grinnell, the noble-hearted merchant of the city of New York, who purely, at the call of humanity, fitted out at his own expense an expedition to go in search of Sir John Franklin and his lost companions, and the name of Lieut. De Haven, the intrepid commander of the expedition, are both familiar to every American; and their efforts and sacrifices have received honorable tribute from the whole civilized world. So far successful as to discover unmistakable traces of the lost mariners, and to communicate the same on the 25th of Aug., 1850, to Capt. Penny, in the service of her Britannic Majesty, Lieut. De Haven also materially extended the limits of geographical discovery in the Polar Seas. To an extended tract of hitherto unknown land, situated near the latitude of 75° 35′ North, he gave the name of Grinnell, in honor of the patron of the expedition; and to a remarkable peak the name of Mount Franklin.

The English map, published under the auspices of the Admiralty, with a spirit of unexampled meanness, ignored the discovery of De Haven, and substituted the name of Albert Land in the place of Grinnell, on the pretence that it was discovered by Capt. Ommany, of her Britannic Majesty's ship Assistance, on the 26th of August, 1850, the birth-day of Prince Albert.

We have no doubt that when the facts are brought to the notice of Prince Albert, he will at once desire and seek to have the name changed. His character for manly honor is very high; the name has been retained by obsequeous officials.

Coal is now being used on all the Mississippi steamers; it costs just one-third the price of wood, for the same purpose.

British Association for the Advancement of Science.

It has been our custom every year to present to our readers some interesting extracts from the proceedings of both the American and the British Associations for the Advancement of Science, and we anticipated the pleasure of doing so this year. We have been disappointed in respect to the former, which was to meet at Cleveland, Ohio, last month, but owing to the cholera being prevalent in some of our western cities, the officers postponed the meeting and although in our opinion they might and should have changed the place of meeting to Baltimore, they have not done so, we therefore can only present some extracts from the proceedings of the British Association.

This respectable body met at Belfast, in Ireland, on the 1st of last month, Sept., in the Queens College, the chair being filled by the President, Sir Roderick I. Murchison, the famous geologist; many very useful and interesting papers were read.

An Ancient Lens.—Sir David Brewster made and confirmed a statement which he properly declared, was "of so incredible a nature that nothing short of the strongest evidence was necessary to render it at all probable"—which was in relation to the discovery, in the recently exhumed "treasure-house of Nineveh, of a rock-crystal lens, where it had for centuries lain entomed in the ruins of that once magnificent city." He established the statement by producing the lens itself which was of a somewhat oval shape, 1 6-10ths inches in its greatest diameter, and of the character known as plano-convex, the plane side being one of the original faces of the crystal, while the convex side had the appearance of having been ground on a lapidary's wheel, instead of being shaped in the dish-shaped tool now used by opticians. It was in a more or less scratched or corroded condition, but could be recognized as a true optical lens, having a focal length of 4½ inches. This is a very remarkable discovery. It has always been believed that the ancients were entirely ignorant of lenses and their properties—to say nothing of the important optical instruments, the telescope, microscope, &c., which are formed of them. The little magnifying glass dug from the graves of buried Assyria will give rise to new ideas and conjectures regarding the arts and sciences of the ancient world.

Route to India Through America.—Capt. Syme read a paper on the comparative routes from England to the East Indies.

Having pointed out that a route towards the North by a line almost direct from England, connecting the Atlantic and Pacific Oceans, would be the shortest, the writer compared the relative advantages afforded in British America and the States where another line was proposed, and stated that the former possessed superior facilities. The plan which he suggested was composed of four distinct links of communication, each independent in itself, capable of separate execution, and opening up important sources of profit. Railways throughout Nova Scotia and New Brunswick, connecting the seaboard with the interior, were essential to the success of the plan. The report then entered into details of the project which contemplated the connection of Lake Superior, Winnipeg, the Rainy Lake, and the rivers and Lakes intervening, to the foot of the Rocky Mountains, and thence by creating permanent dams or reservoirs, to open the passes through these mountains, and regulate the descent of the waters to the Pacific. The paper entered into the calculations of the altitudes of the lakes, the highest water being estimated at about 1,400 feet above tide-water, but having referred to the ascent accomplished in the Welland Canal, and the necessity of a perfect geographical survey to ascertain the levels with precision, urged the practicability of the design, and gave elaborate details of the beauty and fertility of the country to show the important results which might be obtained from opening up the communication.

A paper was then read upon the possibility of making a ship canal through the Isthmus of Panama, and some conversation ensued upon the subject, Capt. Larcom observing that it was intimately in connection with the subject of a western packet station.

[Capt. Syme's plan will never be carried out, it is perfectly impracticable to keep up any internal system of navigation through the British North American provinces for at least four months in the year. The States is the country for a railroad to the Pacific.

Crossing the Red Sea by Moses.—The Rev. Dr. Hincks read a paper exhibiting great research and learning, on the site of certain ancient ruins. The reverend lecturer referred to several Assyrian inscriptions, copies of which he exhibited and explained. As he interpreted the characters, he understood them to record the receipt of tribute of silver, salt, copper and gypsum, and from the accompanying illustrations he traced the existence of such mines in a country north of Jamue, and also in the district of Asia Minor bordering on the Persian Gulf.

M. Pierre Tchihatchef, who had travelled in the country alluded to, being requested by the President to communicate any information which might throw light upon the inquiries of the Rev. Dr. Hincks, in reply to the lecturer, stated that rich mines of salt, copper, and lead, existed in many parts of Asia Minor and Armenia, which, if worked by Europeans, would be very productive, but were now explored upon bad principles. He described the position and circumstances connected with some of the places, and stated that the Persian Government had also sent out scientific gentlemen to search for iron in the country.

Dr. Hincks then entered into critical investigations of some of the names mentioned in Scripture, and gave it as his opinion that the Israelites crossed the Red Sea not at the place usually supposed, close to Suez, but lower down at the open sea, which would bear out more fully the Mosaic description. Some conversation ensued upon the subjects of the paper, and the thanks of the Section were given to Dr. Hincks.

Morphology of Plants.—Prof. McCosh, author of the celebrated work on "The Divine Government," read a paper on this subject.

The learned professor said, the view which he took of the morphology of the plant may be regarded as an extension, in the same direction, of the theory of Goethe. According to this theory, all the appendages of the axis of the plant, including leaves, bracts, sepals, petals, stamens, &c., are formed on a common plan, of which the leaf may be taken as the type. It had occurred to him (Dr. M'C.) that we may regard the branches of the plant, and the whole plant, as formed on the same plan. We may thus regard the plant as constructed on one model throughout. Speaking in this paper of reticulated leaved plants, he showed that there was a correspondence between the distribution of the branches along the axis and the distribution of the venation of the leaf. In some plants the lateral branches are disposed pretty equally along the axis, whereas in others, a number are gathered together at one point, and the plant becomes, in consequence, verticillate or whorled. Now, he found that, wherever the branches are whorled, the leaves of the plant, as in the rhododendron, or the veins of the individual leaf, as in the common sycamore and lady's-mantle, are also whorled. He showed further that, when the leaf has a peteole, the tree has its trunk unbranched to near the base (as in the case of the sycamore, apple, &c., and when the leaf has no peteole, the trunk is branched from the root, as in the common ornamental lawn shrubs—the bay, laurel, holly, box, &c. He showed further that the angle at which the branches go off from the axis is the same as that at which the side veins go off from the main veins.—His observations during the past summer had been chiefly directed to this point. He had measured, in all, about 210 species of plants, and found the angle of the branch and of the vein to correspond. He produced a tabulated statement of these 210 plants, and called the special attention of the section to several of them, as aldershort peteole, and short unbranched trunk, with an angle of 50 deg. both for vein and branch, &c. These observations seem to show that there is a morphological analogy between the venation and the stemage of the plant. Though he could not enter upon the subject at present, he believed that there was a similar unity running through linear leaved plants and monocotyledenous plants. In conclusion he remarked that these views, if substantiated, would give us correct views of the nature of the plant, and in particular show that there is a unity of design in the skeleton of the plant, similar to the unity of design which has been discovered in the skeleton of the animal frame. He believed that they would also make us better acquainted with what Humboldt would call the physiognomy of each species of plant, and furnish some additional marks to distinguish genera and species; and what was to him especially interesting, he was pursuaded they would enable the student of natural theology to make successful use of the plant to illustrate the order which reigns in the universe.

At its termination, a vote of thanks was unanimously voted to Prof. M'Cosh, for his interesting communication.

Scientific Balloon Ascent.—Mr. Welsh then communicated the results of the two balloon ascents which had taken place under the Kew Committee of the British Association. The objects to which attention had been particularly directed in these ascents were the temperature and humidity of the atmosphere at different heights. Mr. Welsh described the thermometers and hygrometers which had been employed during their aerial trips, and mentioned the contrivances necessary to enable the mercury of the thermometers to indicate with sufficient rapidity the temperature of the strata of air through which the balloon was carrying the voyagers in the experiment. For this purpose an apparatus like bellows was placed under the table whereon the instruments rested, and by means of a small weight, this was gradually expanded and caused a current of air to pass over the bulb. The two ascents took place on the 17th and the 26th of August. During the first ascent 100 observations were taken with dry and wet thermometers, and during the second, 180 observations were made. On the 17th the ascent occupied one hour, the highest altitude attained being 19,500 feet, and the balloon descended sixty miles from the Vauxhall Gardens, the ascent and descent having occupied an hour and a-half. The same wind was prevalent during the whole time. The first clouds occurred at 2,000 feet height, after they had been passed through no other clouds presented themselves until the balloon had obtained the height of 13,000 feet. At the highest elevation, clouds were still visible nearly on a level with the balloon, and the atmosphere was filled with fine crystals of snow. In the second ascent the balloon moved more gradually. The greatest height on that occasion was 19,000 feet, the balloon not being able to ascend higher, in consequence of Mr. Green having taken up rather heavier grappling irons than on the first ascent. Their course was, at first westward, and afterwards changed to north-west; afterwards, it again changed to south-west; and they landed near the Boxmoor station on the North-Western Railway. At a height of 3,000 feet there were some clouds, but after passing through them no more clouds were visible. The thermometer indicated, in the first ascent, a fall of one degree for every elevation of 308 feet; and, on the second occasion, a fall of one degree for every 345 feet of ascent. This ratio of fall to height was observed to be very nearly constant.

When Mr. Welsh had concluded his paper, several questions were put to him respecting his feelings during the ascent. He said he experienced no difficulty in breathing, but there was a slight pressure on the ears, and he felt a little pain in the temples.

One gentleman stated that he lived for a month at an elevation of upwards of 15,000 feet without inconvenience, only when using exertion he inspired more deeply.

Figure of the Earth.—Mr. Henry Hennesey then read a paper "On the Connection between Geological Theories and the Figures of the Earth." He said, from the time of Sir Isaac Newton, the theory in question had assumed three phases. After alluding shortly to the various changes which had taken place in it, and wherein the theory, as constructed by Sir Isaac Newton and Clairaut, had failed, and wherein certain portions had been confirmed by later investigations and experiments, he referred to the theory which had been proposed, at a later period, by Professor Playfair and Sir Charles Lyell, stating wherein it also was defective. He further referred to certain opinions of the latter gentleman, which were, at the first sight, certainly very plausible, but on a closer examination they, also would be found to be inconsistent with observation, and, indeed, with themselves.—The theory he alluded to attempted to account for geological phenomena by referring them to the action of water on the surface of the earth. This he considered inconsistent with the strict principles of science, and in the present state of physical knowledge untenable. Having thus stated the position in which all the theories relating to the geological phenomena were placed, it would, he thought, be at once admitted that the science was yet in a very imperfect state, and that much time and patient investigation would be required to bring it into anything like the position which it was so desirable it should occupy.

[To be Continued.]

Timber for Carriages—Proper Time to Cut it.

Being a subscriber to your truly valuable paper, I take the liberty of addressing you upon a subject of much importance to me, and perhaps to many others, to wit: the proper time for cutting carriage timber and the reasons therefor—hickory, ash, and white oak; there is great diversity of opinion here in regard to the proper season, among men of the best judgment; the worms here eat a great deal of our best timber before it is seasoned, even before it is barked. I have often noticed the superior quality of the timber in the Troy coaches; have you any correspondents in that quarter that can give the information and the philosophy of it, when it should be cut, that the worms will not spoil it, and at the same time contain the greatest amount of strength and durability? Your article in the last volume of the Scientific American, on Ship Timber, did not cover the ground, nor did it contain the information I am seeking. I yearly have much valuable timber lost by worms, and am now going to the fountain-head for the remedy. A large number of mechanics are interested in this information, and will be thankful, no doubt, to obtain all in their power. If you will please give it your most early attention you will greatly oblige many subscribers and friends. Very truly yours,

Richmond, Ind. R. L.

[We should suppose that the winter was the best season to cut timber; we are not, however, in possession of facts to give the required information. We know, however, that the hickory, in the eastern part of New York State is altogether of a superior quality to that which grows in the western part. Climate and soil, may account for all the difference in the timber spoken of by our correspondent. Some of our correspondents will no doubt be able to give us the desired information for the benefit of our readers, as they have usually been kindly disposed to do.

Sanatory Congress in Brussells.

On Sept. 20th, Medical Delegates from all parts of Europe met in the Hall of the Royal Academy of Brussels, in Belgium, to discuss questions relative to the dwellings of the working classes, drains, public baths, laundries, good water, ventilation, infant food, mural interments, bad food, criminality of the sexes, the regulation of workshops, and all that relates to general health. It is one of the most important conventions that has met since the world began. The discussions were to be conducted with closed doors, but the reports were to be read publicly. We hope that great good may result from this Congress, to the working classes of Europe. We have much need of such a Convention in New York city, for in some parts of it the denizens, most of them from foreign countries—are more thickly crowded than in London. With our warm summer weather, and the extreme cold of winter, overcrowding in houses is more fatal to health than in London.

Perils of Ballooning.

Mons. Petin made an ascent in his balloon from Bridgeport, Conn., and was carried out to sea. He came down in the water two miles from, shore, and had not a boat arrived soon afterwards, he would probably have been drowned,

NEW INVENTIONS.

Packing of Piston Heads.

F. J. Palmer, ot Greenbush, Rensselaer Co., N. Y., has taken measures to secure a patent for an improved mode of regulating or adjusting the packing of piston heads, by which, when the packing gets loose within the cylinder it may be made to work steam tight without removing the head ot the cylinder. The packing is adjusted and regulated by means of a cam which acts upon rods bearing upon springs, which rest against the packing, and force it out, causing it to press steam tight against the interior sides of the cylinder. By this mode of operation, the packing may be regulated or adjusted by inserting a key through an aperture in the cylinder head, said key fitting in the cam. By turning the key the cam is turned and the packing adjusted, after which the key is withdrawn, and the aperture in the cylinder head closed by a bolt. The removal of the cylinder head, for the adjusting of the packing is thereby rendered unnecessary, and the packing, is made to work steam tight in a very simple and expeditious manner.

Ox Bow Fastener.

John A. True, and Jonathan W. Morrill, the former of Newburyport, and the latter of Hampton Falls, Mass., have invented a useful improvement in a "Bow Yoke Fastener," for which they have taken measures to secure a patent. The invention relates to a new mode of securing the bows in ox yokes, and at the same time making them capable of adjustment, so as to suit all sized oxen. A spring catch is inserted into one side of the bow hole, and permanently secured in the same. In combination with the ox bow, which has several notches cut in one of its sides near one of its ends, into which notches the spring catch projects and holds the bow firmly in its place—the several notches allow the bow to be adjusted to suit all sized oxen.

Improved Oil Box for Locomotives.

Jacob D. Clute, of Schenectady, N. Y., has taken measures to secure a patent for an improvement in oil boxes for locomotives, which consists in providing the journal box with an oil chamber on each side of the journal, which are supplied with oil from the oil cups on the outside of the journal box. They have passages through them, of the entire length of the journal, to supply the oil constantly to the whole of its surface, and there is a communication with another box oil chamber on the inside end of the journal, to supply the inner end with oil, also to prevent the escape of the oil over the side from the journal box.

Improved Table.

P. W. La Roza, of the city of Brooklyn, has taken measures to secure a patent for an improvement in Extension Tables, the nature of which consists in making the table capable of extension, by attaching on each side of it, by hinges, two flexible folding pieces for an additional top to rest upon. These folding pieces being hinged to the two halves of the table, are braced and connected by a cross-piece placed in and across the centre of the length of the flexible side pieces; in this cross-piece there is an additional leg to sustain the additional top. This leg, cross-piece, and flexible side pieces are made to fold up within the table.

New Invention.

An ingenious mechanic ot Nashua, N. H., has invented a new method of driving circular saws without an arbor. With a saw arranged as he has it, a four foot saw will cut a board three and one-halt feet wide, while as now arranged, a four foot saw will hardly cut one and one-half feet. It is also arranged so that it will cut when the carriage is going either way, and will, at the same time, saw nearly twice as fast.

[The above we select from an exchange; we have seen it in quite a number. Who is the man; how does he do it? &c. We are not disposed to believe the statements at all.

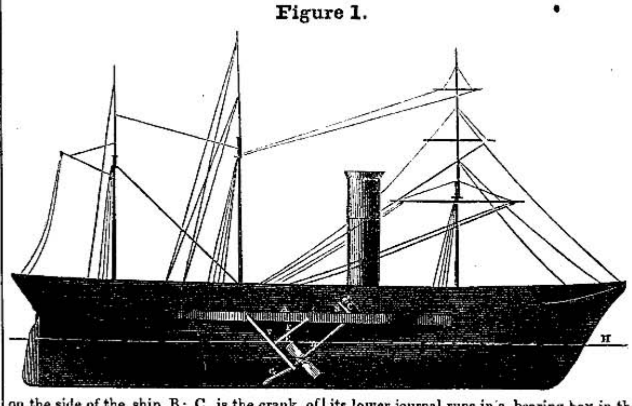
A number of persons from North Carolina have gone up the Alabama River, Georgia, and commenced the manufacture of turpentine. They expect to make 12,000 barrels next year.

WILSON'S NEW PROPELLER.

Figure 1 is a side elevation representing the new principle of propulsion, and figure 2 is a perspective view of the propeller. The inventor is James Spottswood Wilson, of San Francisco, California, who has taken measures to secure a patent. The invention is based on two principles; first, that the force of water increases in an equal ratio with an increase of depth; the second is, that weight, acting on an inclined plane, promotes locomotion.

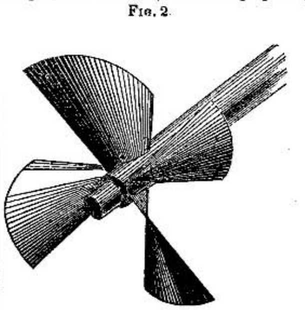
The propeller is constructed of any of the known forms that will allow of total immersion as represented in figure 1, the propeller being submerged below the water line, H. It is placed at the ships' side at an angle that may vary from perpendicular to 45° from the horizon, as represented. A is a guard secured

Figure 1.



on the side of the ship, B; C is the crank of the propeller shaft, D; E is the propeller; its lower journal runs in a bearing box in the brace, F; G and F' are also braces. The crank is attached to the end of a connecting rod of the piston rod, the cylinder being placed athwart the ship. The same arrangement is attached to the other side of the vessel. The propeller is moved by the direct action of the engine. This description will enable any one to understand the arrangement and operation of this propeller. The object of placing the propeller in this position is to obtain an application of force to produce the greatest speed in the most simple manner.

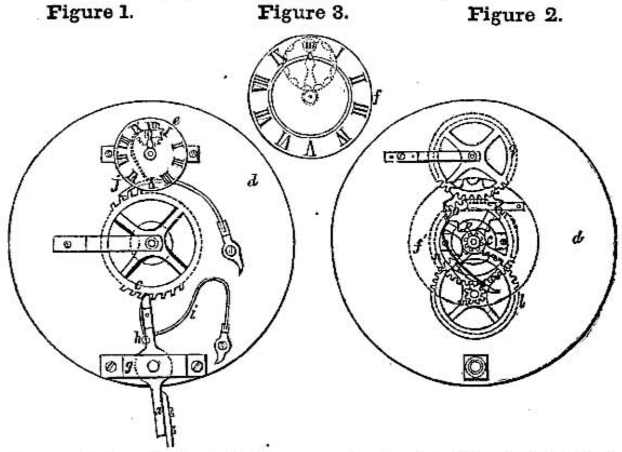
Fig. 2.



These wing wheels will be about 10 feet in diameter, the depth at which they will act to the best advantage is 3 feet. Mr. Wilson advances some very excellent arguments for the superiority of this method of propulsion.

GRAYSONS'S ODOMETER.

Figure 1. Figure 3. Figure 2.



This is an instrument to be attached to carriages for showing the distances over which the wheels pass. As improved, it is the invention of Wm. Grayson, of Henly-on-Thames, England, who recently took out a patent for the same, which has been published in the last number which we have received of "Newton's London Journal." As we have had many enquiries about these instruments, we know that this article will interest many of our readers.

This invention consists of an arrangement of apparatus denominated an "odometer or road-measurer," to be attached to a street cab, or other vehicle, for the purpose of denoting the length of way passed over by the running-wheels.

The apparatus is composed of a train of wheelwork, with two dials and indexes, to indicate the distance travelled. It is mounted on a metal plate and enclosed in a box which is affixed to some convenient part of the carriage, in such a manner that one dial may be seen from the outside thereof; so that, previous to entering thecarriage, the passenger may examine the dial, and have the index placed at zero. The other dial must be inspected from the inside of the carriage, and is intended for the use of the proprietor, to serve as a check upon the driver, who will be accountable for the distance travelled, as indicated or marked upon this dial, after due allowance for back carriage. The train of wheels whereby the indexes are actuated is set in motion by a pin, stud, or cam, on the nave of one of the running-wheels; this pin, stud, or cam, is, at every revolution of the wheel, brought against the lower end of the pendent lever, which it forces back; and the upper end of the lever is thereby made to act upon a ratchet-wheel, which forms part of the mechanism of the odometer.

Figures 1 and 2 exhibit the improved odometer or road-measuring apparatus which forms the subject of this invention. This instrument is applied to the upper part of the body of a street cab or other vehicle, in a suitable position above the axletree; and from it depends a lever, *x*, the lower end of which is acted upon by a pin, stud, or cam, on the nave of the running-wheel. As the wheel rotates, the pin will be brought against and caused to force back the lever, by which means, a tooth at the upper end of the lever will drive round the ratchet-wheel, *c*, one tooth; as will be understood on examining fig. 1, which represents a back view of the instrument. In this view is shown the wheelwork at the back of the plate, *d*, on which all the counting mechanism is mounted. The dial *e*, represented in this figure, is inspected from the inside of the carriage, and, being enclosed within a box, cannot be tampered with by the driver. Figure 2 represents a front view of the plate, *d*,—the passenger's dial, *f*, being removed, and its position only indicated by the dotted circle, *f*, in order that the parts beneath may be more clearly seen. Figure 3 exhibits the passenger's dial, *f*, detached. The lever, *x*, turns on a pin or centre mounted in the bridge-piece, *g*, on the back of the plate, *d*, as shown in figure 1.—Its upper end bears against a stop, *h*, and is kept in its proper position by a spring, *i*.—The ratchet-wheel is prevented by the spring-click, *j*, from moving more than one tooth at a time. On the axle of the ratchet-wheel, at the opposite side of the plate, *d*, is a pinion, *k*, with 10 teeth, which gears into a cog-wheel, *l*, with 100 teeth. On the axle ot this wheel, *l*, is another pinion, *m*, of 10 teeth, which gears into a wheel, *n*, of 100 teeth; and on the shaft ot this wheel, *n*, is mounted a hollow shaft, that carries the index of the passenger-dial, *f*, which, as will be seen by referring to figure 3, indicates quarters of miles, half miles, and miles, to the number of ten. For the purpose ot indicating a larger number of miles, the patentee has adapted to the back of the dial, *f*, a magic or jumping index, consisting of a small dial with tens printed thereon, which is connected to a jump-wheel, *o*, (fig. 2,) behind the dial, *f*, shown by dots in fig. 3. On the hollow shaft which carries the index, is mounted a pin or stud, *p*, which, at every rotation of the wheel, *n*, acts on the wheel, *o*, and jumps it one tooth, —thereby indicating that ten miles have been travelled. The index being connected to a hollow shaft (which is mounted on the shaft of the wheel, *n*, and is carried round thereby by friction of contact) may be moved round by the finger, when required to bring it back to zero, without deranging the other mechanism; and, before a passenger enters a vehicle, he should see that the driver sets the index at zero; so that, at the end ot his journey, he may, by a simple inspection ot the dial, at once ascertain the distance he has travelled.

In order tnat the proprietor may be protected from fraud, his index, which is inside the carriage, will continue to count and indicate the total distance travelled during the several journeys throughout the day. The proprietor's index, as well as the passenger's index, is worked by means of the toothed wheel, *n*; but an intermediate wheel, *q*, of an equal number of teeth, communicates motion from the wheel, *n*, to the index, which indicates, on the dial, *e*, the total distance travelled. This dial, *e*, is also provided with a magic or jumping index, to indicate the tens; but, as the jumping index is precisely similar in construction and operation to that connected with the passenger's index, and already described, it will not be necessary to enter further into detail in reference thereto. The proprietor's dial and index are kept under lock and key.

The apparatus and train of wheelwork, above shown and described, are intended for a vehicle of which the running-wheels measure 12 feet in circumference; and, for this purpose, the ratchet-wheel is made with 44 teeth, which is obtained by dividing 528 (the number of feet in the 10th part of a mile) by 12, the circumference of the running wheel, which must, in passing over a tenth of a mile, revolve 44 times. It will therefore be evident that, if a running-wheel of any other dimensions is employed, the number of teeth in the ratchet-wheel must be varied; for instance, supposing the running-wheel measures only 11 feet, then, by dividing 528 by 11, we have 40, which gives the number of teeth for the ratchet-wheel,—all the other parts remaining the same.

Scientific American

NEW-YORK, OCTOBER 16, 1852.

Power Machines a Benefit to Operatives.

When spinning jennies and power looms were first introduced into England, nothing would do with the outraged and insulted spinsters and weavers, but pulling down the factories and the breaking the machines. This was a very foolish operation, but the machine-destructives thought it was a very wise one; they, no doubt, imagined they had slain their greatest enemy. Poor short-sighted mortals! how much they resembled Don Quixotte battling with the wind-mill. We do not say but the hand-spinners and hand-loom weavers of old enjoyed more of the comforts of life than they do now, and perhaps enjoyed the world with a more hearty relish, but this we do know, that those power machines which have superseded severe human toil, have greatly benefitted the very operatives who were ruthlessly opposed to their introduction. Gilbert Burns, the brother of the great poet, though not a poet himself, was a shrewd man, possessed of a sound head, and who had labored severely as a farmer, declared that the invention of the Threshing Machine was one of the greatest blessings ever conferred upon mankind. The terrible drudgery of the flail was as the life of a helot to him; he became a free man when the threshing machine was invented. There is the machine for planing wood, too; its introduction was violently opposed by carpenters,—their occupation, like Othello's, was gone, and nothing would suit many of them but smashing up the planers. But are there any carpenters in our country, now, who do not look upon this machine as a blessing? It was their emancipation; it relieved them from a toil which, at best, is gross drudgery. The trip hammer, too, although a very simple innovation, was also looked upon with exceedingly jealous eyes, by the performers of heavy tragedy at the anvil; but what would we have done for the heavy shafting of our steamboats, had those tragedians still monopolized the stage of the stithy? We might go on and enumerate a great number of machines, and recount the benefits which they have conferred upon the operative classes; but we have said enough to direct attention to the point which we wish to elucidate, and the doctrine which we wish to enforce. We are the advocates of all new and useful improvements in machinery, and we are the disseminators of information respecting new inventions and discoveries—this is our business; if we did not believe that machinery conferred blessings and benefits upon mankind, we could not conscientiously follow after such a profession. We believe that machinery has done wonders for the elevation of our race, and we also believe that it has but began to fulfil its mission; our heart and soul, therefore, is with this work of improvements in machinery.

Some people have extolled the blessings of machinery, for allowing more time for mental development; this is one benefit it has conferred upon mankind, but far be it from us to speak favorably of machinery on this account merely. Laziness is a vice, and a lazy idle man should not eat; every man and woman should *do* something for themselves. There are too many men and women who kill themselves with idleness. There are thousands in our cities who are not under the necessity of working to procure daily bread, who nevertheless, for their own health and pleasure, should labor, or take active exercise in the open air every day. On the other hand there are thousands who drudge away at unhealthy occupations, wearing out soul and body to win their daily bread. Improvements in machinery will benefit this latter class, and improve their condition. Improvements in machinery for the rapid and cheap construction, manufacture, and execution of domestic utensils, goods, and labor, are the very things on which the attention of philanthropic inventors should be fixed. "They were good old days," say the old folks at home, "when all things were made for the family on the plantation and farm. Our clothes were not so fine, but nobody wanted; there was less pride and more contentment." There is much truth in this, and we are far from believing that large factories, and congregated hundreds laboring together in pent up workshops, is a higher development of humanity; we believe that, in the majority of cases, it is the very reverse, —men and women have become the servants of machinery, instead of machinery having become their servants. Can we not look to a future of better things? We can at least point to the road which will lead to it; this is our present object. Sewing machines, simple and cheap machines for making boots and shoes, great improvements in small carding and spinning machines, and weaving looms, together with other machines for doing different kinds of domestic labor, would conduce to a greater elevation of our race; this is the climax of our remarks—improvements in machinery for the benefit of the toilers.

Our Atlantic Steamships.

About a year ago some of the London journals, devoted to engineering, published a number of articles on the folly of employing side-lever engines in steamships, and advocated the superiority, in every respect, of the oscillating engine for the same purpose. These articles have found a second-hand advocate on this side of the Atlantic. It is said, now, that the side-lever engines of the Collins' steamers are mere copies of the English Marine Engine, and that these engines were put in to give confidence to the American public, or they would not have found any patronage; that is, passengers would not sail in them. It is also said that if these ships were to be built over again, the oscillating and not the side-lever engines would be employed in them. The objections urged against the side-levers are, "they occupy so much room, being more bulky, and consequently more expensive." The oscillating engines, on the other hand, are more compact, consequently they are not so expensive.

Well, supposing our steamship companies adopted the oscillating engine in preference to the side-lever, would this not also be merely copying after the English engine? Assuredly it would; what is the difference, then, in this respect? Nothing. But would the Collins Company, if they had their engines to put in again, adopt the oscillating kind; and would the able engineers of the Novelty and Allaire Works recommend them in preference to the side-levers? We believe they would not. It is evidence of narrow-mindedness to refuse to adopt a good thing because it is foreign, and it is a sign of good sense to adopt an excellent thing whatever paternity it may have—Indian, Chinese, or English. Those engineers who prefer, at least in heavy and expensive engines, to adopt those of tried and proven qualities, exhibit more wisdom than those who adopt, recklessly, less expensive but untried and unproven engines. It is all very well to write long vaunting articles about this and that evil in present modes of engineering, but when this is done without facts to back up assertions, we may set down the writer as a better paragraphist than practitioner.

In 1848 a Commissioner was appointed by the British Government to examine into and report upon the state of the mercantile marine steamships. The President of the West India Mail Company gave in his evidence in favor of the side-lever engines for steamers; and, until we have further practical data to guide us, we must say that those engineers who counselled the side-levers for the Collins' steamships, exhibited sound judgment and good sense. It is not the mere economy of space and price of an engine at first, which, in the long run, proves most economical. The economy in repairs and general expenses must be looked into. An engine can be built of equal power with another and not cost one-half as much to construct it. It may run well for a while, but, in the course of a year, it will cost perhaps five times more for repairs, and never at best give satisfaction. We must remember, that every week which a large steamship is unnecessarily laid up for repairs, involves a great loss in the mere interest of money invested in its construction. How necessary, then, to count well the cost of what kind of engine should be employed in a steam ship. In our opinion, the side-lever is the most economical, and therefore the best for steamships exposed to Atlantic storms. All the parts are so well braced together, and so arranged for steadiness of action, that, in our opinion, the oscillating is greatly inferior to it? The beam engine has beautiful adaptations for working the pumps, and although it occupies more room than the direct acting engine, still, it is no more an objection against its employment than it would be against the oscillating engine, for other purposes, because *it* is more bulky than the steam wheel. We have practical data for the side-lever engine, where is data for the superior economy of the oscillating marine engine? A new engine cannot be put into a large steamship every two or three years; neither will it do, to put out more for repairs, in the course of a few years, than the whole original cost of the engine. We are the advocates of sensible improvements, but no friends to innovations for mere innovation sake.

Beardslee's Planing Machine.

On page 20, last volume of the Scientific American, we published an illustrated description of the Planing Machine of George W. Beardslee, of Albany, N. Y., and made some very strong statements respecting its working qualities. Since that time this machine has been winning its way into public use and favor. In the city of Albany, Ahijah Jones has invested a large amount of capital in dressing lumber, and has three of the Beardslee machines in active operation, each of which (as we learn by the Albany Argus) dresses 4,000 boards or planks in ten hours, including all stoppages. One of these machines has planed stuff for Messrs. Boardman & Gray, of Albany—the famous pianoforte makers—which always was planed by hand heretofore, no power planing machine being able to do the work. The stuff was for the "Tuning Boards" of pianos. There are now forty of Beardslee's machines in operation, in different parts of our country, and the demand for them is so great, that 150 men are now employed in their construction at Townsend's Machine and Foundry Works, in Albany. A large and splendid machine is now being constructed, for London, as the latest American improvement in such machines; it will excite admiration, and what is better, confer great benefits upon those who are to run it. The establishment of Mr. Jones is but new; he owns the right for Albany, which is a great city for lumber, and it seems he is driving a thriving business. One of these machines is now in operation in Williamsburg, near this city; the lumber which it dresses is nearly as smooth as a polished slab of marble. Every one, who has seen the lumber planed by it, has spoken enthusiastically of its beautiful and even surface. Beardslee's machine is a "line cutter," and has a self-adjusting throat, and is capable of the nicest adjustment to plane boards of great thinness; of this we have an evidence in the tuning boards which were planed for the company mentioned above. We have seen some thin boards planed by it, which we are sure could not be planed by a rotary cutter with safety. We welcome every improvement in machinery, let the improvement come from what quarter it may, and be it for any useful object whatever.

The Plant Fly Trap.

We have read of the vegetable snake of Africa, and the water-spider flower in Persia; we have seen a pea grow up with wings, which might easily be mistaken for those of a dragon-fly, but one of the most ingenious fly-traps in the world is a plant which grows in our shaking deep marshes; it has a small fibrous root; it has no leaves; the stalk is about three-sixteenths of an inch in diameter, is one foot high, and is surmounted with a flower; it is furnished with a bag of a peculiar form, and something like a purse at the throat. The mouth is lined with hairs, which are the watchers for prey and the sentinels to the vegetable nerves of the plant; they are very numerous and powerful, and act at once upon the throat of the bag, which has a thick cartilage, like an india rubber band. No sooner does a fly enter this bag, than, like the sensitive plant, it contracts, closes upon the fly, and makes it a prisoner within its vegetable crushing folds. In this manner the plant supplies itself with food, and on cutting one open with a knife, the bottom of the bag will be found stuffed with the skulls and limbs of water flies, reminding a person of some cannibal's cave. How wonderful are all the works of the Almighty; every seed bringeth forth after its kind, and with all its special adaptations.

The Widow of Henry Bell.

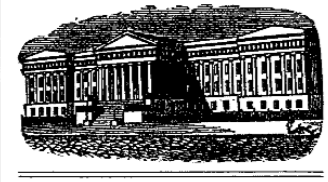
It is well known to all acquainted with the history of steam navigation, that a Scotch carpenter, named Henry Bell, although not the first who invented or proved the practibility of navigating rivers by steam power, yet he was the first in Europe who successfully established the fact. This was in 1811, three years after Fulton commenced running with the Clermont between Albany and New York. The name of Henry Bell's first boat was "The Comet." It made regular trips between Glasgow and Greenock, two cities on the river Clyde. Bell had no sooner (after great risk) established the payability of steam navigation, than richer men entered upon a struggle of competition, which, from his inadequate means, at last forced him to retire. His wife, a heroine of the first water, did business on her own account, and freely advanced all her extra funds to her husband, in order that he might carry out his favorite scheme and come off with success. When Henry Bell grew old and infirm, his friends applied to the British Government to get a pension for him on account of the valuable services he rendered to the navigation of Great Britain. This was refused for the reason that he was not the original inventor,—Mr. Miller, of Dalswinton, being that person, and he was dead. The citizens of Glasgow, however, gave him a pension of £100 per annum, and since his death, which took place some years ago, they have given £50 to his old wife. We see by the "Scottish Guardian," of Sept. 10, that this pension has been increased to £100 per annum—nearly $500. It is a remarkable fact that New York, in America, and Glasgow in Scotland, are the two most famous cities in the world for the building of steamships, and these two cities have the honor of being the places, where steam navigation was first established on the two separate continents. In 1823 the revenue of river dues, in Glasgow, was $35,000, now it is $380,000. This great increase has been brought about by steam navigation.

Burning Smoke.

Two years ago the cities in England and Scotland were like smoked hams, owing to the dense volumes of smoke which filled the atmosphere by the use of bituminous coal. The fields of grain were black in appearance from the same cause, and the hedges were in the like condition. Now all is changed; the sky is no longer like a smoke-house; the rains descend in clear streams, not in inky rivulets; the houses begin to look as it their faces were washed, and the hedges begin to wear their old dark green appearance. All this has been accomplished by an Act of Parliament making it penal for factories to let their smoke escape The smoke is all burned by simple contrivances of furnaces, among which "Juke's," which was illustrated in last volume of the Scientific American, is very conspicuous. A Commission of Government first established that the burning of smoke was perfectly practicable, and Parliament then enforced the fact by law. The factory and mill owners soon found out how to fullfil the conditions of this law, and the result is, they save a great deal of fuel by the operation. Like many other good things, this important improvement at first met with a great deal of opposition; there are some men who cannot judge when a good turn is done to them, and we can say that this is true in respect to many useful inventions.

Report on Lighthouses.

We return our sincere thanks to Mr. George Mathiot, the eminent Electrotypist, and T. A. Jenkins, Esq., Secretary of the Lighthouse Board, for a copy of the "Report on Lighthouses," by the Commissioners appointed by Government; also for the reply of the Commission to the Fifth Auditor, who formerly had control of the inefficient old system; also for a copy of a report containing a list of the lighthouses, lighted beacons, and floating lights in the United States. These documents are of great use to us, and the gentlemen who have favored us with them have not only conferred a favor upon us, but will thereby be the means of doing good to others.



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING OCTOBER 5, 1852.

GRAIN SEPARATORS—By Jacob Bergey, of Wadsworth, Ohio: I claim the use of a hollow revolving cylinder, so constructed and so moved, as set forth, for the purpose of a straw carrier, by which the advantages enumerated and explained are obtained.

IMPROVED VISE—By Wm. Butler, of Little Falls, N. Y.: I claim the arrangement of the sliding bar with screw attached thereto, with reference to the fast jaw A, and the moving jaw B, when said sliding bar is provided with a series of holes, or their equivalents, and said jaw, B, is provided with a pin or its equivalents, where B can be set at varying distances, with respect to A, and that distance afterwards regulated by the screw.

HAND PRINTING PRESSES—By Charles Foster, of Cincinnati Ohio: I claim, first, the arrangement substantially as described, in a hand power press, of guide bars resting upon adjusting points, or hinged at their rear ends, and guided at their front ends to a vertical vibration, concentric with said points or hinge, so that the entire bed, guide bars, and their appendages shall move bodily upward upon giving the impression, and return by their own weight to the state of rest, whether operated by a shaft extending below the bed, and working a toggle joint beneath the bed or bars, as described, or in any equivalent way.

Secondly, I claim, in connection with the described arrangement, the ascending grade at the fore end of the guide bars, for the purpose of limiting the range of the toggle, at the period of giving the impression.

IMPROVEMENT IN SEED PLANTERS—By D. Haldeman, of Morgantown, Va.: I claim the employment or use of the adjustable tyre, or tyres, for the purpose of varying the diameter of the wheel, to allow the seed to be deposited the required distance apart.

ROTARY STOVE GRATES—By Alex. Harrison, of Philadelphia, Pa.: I claim, first, the combination of the rotary movement of the bottom grate with the vertical annular grating, or its equivalent, surrounding the same, for the purpose set forth.

Second, I claim the rotary movement of the bottom grate, with the controlling tilting movement of the same, substantially as described.

Third, I claim the combination and arrangement of the several parts, whereby the aforesaid rotary and tilting movements of the bottom grate are effected, substantially as described.

SEED PLANTERS—By R. M. Jackson, of Penningtonville, Pa.: I claim the corn planter sieve and its appendages, for the purpose of sifting and depositing the fine earth upon the grain, and throwing off stones and such matter as would obstruct the young sprout in coming through the ground, substantially as described.

SPARK ARRESTER—By Volney P. & B. Kimball, of Watertown, N. Y.: We claim the revolving screen in combination with the chamber, the lower part of said chamber communicating with the smoke pipe at a point below the tops of the exhaust tubes, by which arrangement a downward draught is created within the chamber, and the cinders drawn from the screen, as it revolves, thus preventing the clogging of the screen, as set forth.

BEE HIVES—By L. L Langstroth, of Philadelphia, Pa.: I claim, first, the use of a shallow chamber, substantially as described, in combination with a perforated cover, for enlarging or diminishing at will the size and number of the spare honey receptacles.

Second, the use of the movable frames, or their equivalents, substantially as described; also their use in combination with the shallow chamber, with or without my arrangement for spare honey receptacles

Third, a divider, substantially as described, in combination with a movable cover, allowing the divider to be inserted from above between the ranges of comb.

Fourth, the use of the double glass sides in a single frame, substantially as set forth.

Fifth, the construction of the trap for excluding moths and catching worms, so arranged as to increase or diminish at will, the size of the entrance for bees, substant ally in the manner set forth.

UPRIGHT PIANOFORTES—By R. E Letton, of Quincey, Ill.: I claim, first, extending the upper part of the metallic plate or cap at the part where the shorter of the strings, are placed over the sounding board, and supporting it by blocks or supports, which pass through the sounding board to the frame timbers, substantially as set forth, whereby the higher end of the bridge, or that part on which the strings of the higher notes rest, is allowed to be brought nearer to the centre of the sounding board, to get a better vibration.

Second. The combination in the manner substantially as described, of the cushioned block and the adjustable button, on the upright wire, attached to the key for the purpose of preventing the entire descent of the hammer after striking, until the key is left free.

IMPROVEMENT IN MACHINES FOR WRINGING CLOTHES—By Jos. P. Martin, of Philadelphia, Pa.: I claim the keeping of the ends of the clothes' sack distended, during the process of wringing, to equalize the twisting of the same at all parts, by means of the elliptical spring leaves and elastic wings, substantially as described.

IMPROVED APPARATUS FOR PUDDLING IRON, ETC. By James McCarty, of Reading, Pa: I claim, first, the combination of an automatic rable with a revolving or moving basin, arranged and operated substantially as set forth, or with a stationary basin or bottom, whereby much manual labor is dispensed with, for stirring the iron in the process of puddling.

Second, the arrangement of the hollow shaft, cooler, and moving basin, in such manner that a stream of water can be kept circulating round the bottom and sides of the latter to prevent it from being overheated, substantially as described.

Third, the combination of the crank and swinging guides, or their equivalents, which enables the operator to make the rable stir over different parts of the bottom, and at different angles to the side of the furnace, and also to remove it out ot the way when necessary.

PIANOFORTES—By James & John McDonald, of New York City: we claim, first, the combination of the wind chest, and flute or other similar wind-pipes, with the horizontal pianoforte action, in the manner substantially as set forth, to wit, the pipes being placed horizontally at the bottom of the case below the pianoforte action, and the wind chest placed below the front ends of the pianoforte keys in such a manner as to allow the valves to be operated directly by the said keys.

Second, the manner of opening the valves of the flute or wind pipes, to play an octave lower than the piano, either at the same time that they are being played at the same pitch as the piano, or not, by means of the series of levers, arranged and operated upon by the blocks upon the vertical pins under the piano key.

PRINTING PRESSES—By J. G. Nicolay, of Pittsfield, Ill.: I do not claim the use of conical impressing cylinders; but I claim the peculiar arrangement and combination of conical impressing cylinders, one or more in number, each provided with a set of conical distributing inking rollers adapted thereto, and with a rotating wheel or disc, substantially as described.

I also claim, in combination with the conical impressing cylinders, the position and arrangement of the clamp, consisting of the metal plate, spring, and arm or lever, which retains the paper at the required angle to receive the impression and release the same, when the impression is taken, substantially as set forth.

EXPANDING WINDOW SASHES—By Mighill Nutting, of Portland, Me. Ante-dated June 16, 1852: I claim the sash, constructed in two pieces, so that both, when brought together, shall be narrower than the distance between the bottoms of the grooves in the jambs of the frame in which the sash is designed to be placed, by at least the thickness of one of the stop strips of the frame, and connecting these two pieces of the sash in such manner that one will slide past or into the other, so that the sash can be contracted or expanded, as may be required to fit different window frames and to adapt itself to the varying width of the same frame, and also to admit of its being put into and taken out of the frame, without removing the stop strips therefrom, the two parts of the sash thus moving towards and from each other, having springs, or the equivalent thereof, adapted to them, so as to give them a constant tendency to diverge from each other, that the sash may at all times expand promptly and fill the frame, to hold itself firmly in place, substantially as described.

MILLING MACHINES—By Wm. H. Robertson, of Hartford. Ct.: I claim the construction and combination of the vertically moving cutter stock or poppet head, with the driving pulleys, &c., mounted on a swinging frame, hung with a pivot hinge at the bottom, the connection between the two being effected by radius rods, in the manner and for the purpose set forth and described.

METHOD OF PRIMING FIRE-ARMS—By Christian Sharps, of Hartford, Ct. Patented in England, April 22, 1852: I claim the priming of fire-arms, by throwing a pellet of percussion or priming material over the nipple, at the time the cock is descending thereon, so that the priming shall be struck down in its flight between the cock and the nipple, and exploded.

WINDOW FRAMES By Henry C. Smith, of Portland, Me.: I claim the pulley style, constructed of the pieces, as set forth, in combination with the springs, by which means I am enabled to make use of solid or immovable bead strips, and bands, and to remove the sash at pleasure from the frame, in the manner substantially as described.

TIME-PIECES—By SILAS B. Terry, of Plymouth, Ct: I claim, first, having the balance of a clock, or time-piece, on a spring or strip of metal, which is fixed, or prevented from turning at both of its ends, but capable of twisting between the ends, substantially as and for the purpose described.

Second, making one part of the fork or crutch wire flat and thin, substantially as shown, to allow it to bend or move in a similar manner, and connecting the said fork or crutch wire, with the balance in any manner, as shown, which causes it to give its impulse in the same direction as the motion of the balance, the said bending or motion of the fork or crutch being for the purpose of allowing it to transmit the impulse in the above direction.

CHURNS—By L. A. Brown & Hubbard Bigelow, of Hartford, Ct. (assignors to H. K. W. Welch): We claim the combination of the tub, including the appendages described, with the frame, and stands, or any other convenient frame work, adapted to the use of the tub, in a vertical and horizontal position, but in the manner and for the purposes, substantially as set forth and described.

DESIGNS.

COOKING STOVE—By Chas. B. Tuttle, of Amherst, N. H.

GRATE FRAME AND SUMMER PIECE—By Adam Hampton, of New York City.

TABLE FRAME AND LEGS—By Walter Bryent, of Boston, Mass.

NOTE—Five of the patents issued in the above list were secured through the Scientific American Home and Foreign Patent Agency.

Corrosion of Metals in Water.

Having had some inquiries made of us respecting the amount of corrosion which iron undergoes in water, we present the following remarks of Mr. Adie, of Liverpool, Eng., which were read some time ago before the Institute of Civil Engineers. The object of his experiment was to test the rate of corrosion of metals in fresh water, brine, and sea water.

These experiments were made with weighed pieces of metal immersed in the three solutions under examination. Those which are compared together were tried in every respect under similar circumstances, as to weight and surface of metal; size and form of vessel; quantity of water employed; light and temperature.

The experiments on zinc were made with that metal in connection with a piece of copper, so as to form a galvanic couple; for zinc, when unconnected with a less oxidizable metal, is soon covered with a crust of oxide, so that pieces, after a month's immersion in water, are found to be slightly heavier than at the beginning of the experiment. This is not the case when a piece of silver or copper is in metallic connection with zinc; for then the white oxide of the metal is gradually precipitated to the bottom of the containing vessel.

A plate of zinc, 1 superficial inch in area, immersed for 60 days in sea water, lost 1·6 grains.

A similar experiment in fresh water lost, 1·15 grains.

A plate of zinc, 7 superficial inches in area, immersed for 96 days in fresh water, lost 4·9 grains.

A similar experiment in brine, or the saturated solution of common salt tested as above for dissolved air, lost 1·4 grains.

Wrought iron wire:—

Twenty pieces of iron, weighing 374 grains, immersed for 80 days in fresh water, lost 1·9 grains.

A similar experiment in sea water, lost 2·6 grains.

A similar experiment in brine, lost 0·1 grains.

Cast iron:—

Three rods of cast iron, weighing 787 grains, immersed for 62 days in fresh water, lost 1·6 grains.

A similar experiment in sea water lost 2·0 grains.

A similar experiment in brine lost 0·4 grains.

On comparing together the loss of weight of metal in the fresh water, sea water, and brine, it will be observed, that in sea water the corrosion is about one-third more than in fresh water; while in brine, the loss of weigh is about one fourth part of the loss in fresh water, and one-fifth part of that experienced in sea water; showing that brine possesses considerable power for preserving metals from corrosion. The carbonates of potash and soda are still more effectual in arresting oxidation; for in saturated solutions of these salts, iron wire remained immersed for sixty days without any amount of corrosion being detected. The surface of the plate of zinc, when taken from the brine, was the same as at the commencement of the experiment, excepting in three spots, where there was deep corrosion. The principal of these being around the point, where the copper wire connected the plate with the negative element. The difference between fresh water and sea water, in their power of oxidizing metals, is in the reverse order of the quantities of oxygen dissolved by them, as given in the preceding experiments; where the sea water is to the fresh as 78 to 85. The principle on which the preserving power of alcohol is attempted to be explained may, in like manner, be here applied to pure water. Although the experiments on the corrosion of iron were continued for eighty days, the difference between the action of common water and brine may be made apparent in one day. In the fresh water, the hydrated peroxide of iron is seen forming; while in the brine, only a slight tinge of a greenish infusion can be detected, a sure indication of the scarcity of oxygen.

The experiments given to determine the respective rates of corrosion in fresh and sea water, are only correct for pieces of metal wholly immersed in them. Where the surfaces are subject to be wet and dry, the corrosive effect of sea water will greatly increase; on the same principle that iron once coated with rust decays much faster after the rust has provided a lodgement for moisture. Take for example a bar of iron in a field, and a similar piece on the deck of a ship. On the first, the dew of night deposits water, which corrodes until the return of the sun dries it off. On the second, on the deck, it deposits spray, which acts like the dew, until the sun dries it off; but when dried, there is left a thin deposit of salt, with a powerful affinity for moisture, which on the return of evening will attrect moisture from the atmosphere, long before the dew wets the metal in the field. Thus it is that a coating of salt or rust keeps metals much longer in a wet state than if their surfaces were clean.

The steam propeller yacht, Col. John Stevens, has been sold to the Newfoundland Telegraph Co., to overhaul the steamships from Liverpool for New York, and obtain news to be sent over the telegraph wires.

Heat of the Body.

The phenomena of heat in the body is something like that produced by the combustion of fuel, such as coal, only in the body the combustion is slow and the heat far lower than that of flame. The act of breathing is very like the bellows of a smith, and our food is very much the same as the coals which he puts upon his fire. It is probable that some heat may be produced in the various secreting organs of the body, by the chemical action which takes place in them.—From these two sources animal heat is most probably derived. It is positively certain that the blood is heated at least one degree of Fahrenheit in passing through the lungs; and that arterial blood is warmer than venous. Most of the phenomena which occur in the production of heat may be explained by attributing it to a combination or a union of the oxygen of the air with the carbon of the blood in the lungs.

This supply of animal heat enables the body to resist the fatal effects of exposure to a low temperature. In the polar regions the thermometer often falls to 108 or 109 degrees below zero; and yet the power of evolving heat, possessed by our bodies, enables us to resist this degree of cold. The temperature of our bodies in that region is about the same that it would be were they in the warm regions near the equatar. The thermometer, it plunged into the blood of man, in both situations mentioned, would indicate a temperature about the same. Our bodies have nearly the same temperature in both places; because, so to speak, and it is not very absurd, the combustion, or fire in the lungs, gives out more heat, it burns with greater intensity in the polar regions than in the equatorial. We all know that a large fire will warm our rooms, no matter how cold it may be. We can give our rooms the same temperature in winter that they have in summer, if we regulate our fires accordingly. A little more fuel is all that is requisite for that purpose. Nature has so ordered, that when our bodies are in a cold temperature, we inspire more air than when they are in a cold temperature.—In other words, she compels us to take in more fuel and increase the combustion in the lungs.

The Esquimaux eats blubber, which is mostly all carbon, and the Laps drink plenty of grease. In warm countries the food of the Lap would kill the negro, and the food of the nations of the West Indies would not be able to keep the Esquimaux from perishing with cold.

The temperature of the human body, and of most warm-blooded animals, is from 98 to 100 degrees Fahrenheit, and is effected but a few degrees by any variation of that of the surrounding atmosphere. Animals are warm-blooded when they can preserve nearly an equal temperature, in despite of the atmospheric vicissitudes from heat to cold, and from cold to heat. They have a temperature of their own, independent of atmospheric changes.

The time will soon arrive when thicker clothing must be worn by our citizens at the north. They must line their vests well along the back bone, and provide against freezing. It is a fact that warm clothes tend to save food, as all animals eat food in proportion to the cold of the atmosphere. This is the reason why cattle that are well housed consume less food, and keep in better condition than those which are shelterless and exposed.

Dangerous Feat.

Quite a sensation was created in the vicinity of Broadway and Fulton st., this city, on Wednesday morning last week, by a man climbing up the steeple of St. Paul's Church, by the lightning rod on the outside. He went up for the purpose of putting a rope around below the ball, by which to haul up the ladders to be used in re-painting the steeple. The extraordinary feat was performed by Joseph Dawson, a man 53 years of age. This is the fourth time he has ascended the same steeple in that manner during the last ten years. St. Paul's steeple is over 200 feet high, and we understand that the painting of it costs about $600.

TO CORRESPONDENTS.

F. D. H., of Ga.—The best way for you to dispose of the invention will be for you to send us your letters patent, and we will get up nice engravings of it and publish in the Scientific American, providing the invention has not been illustrated in any other journal.

N. E., of Miss.—Some time since we remember reading the notice you refer to, but have not since thought of it. We saw at once the utter stupidity of the affair, and did not deem it worthy of notice.

R. A., of Va.—In No. 8, of our last volume, we published an engraving of Ericsson's Caloric engine, and expressed our opinion respecting it. Our confidence has not increased a particle since, notwithstanding the steamship which is being built. If it proves better than steam, we shall be ready to acknowledge it. The character of the men engaged in it are, so far as we know, above suspicion.

W. W., of Ky.—You seem not to understand the rules which govern the conduct of editors when the correspondents fail to attach their names to communications; besides this objection, we would not publish your article for any money—we spurn the idea of receiving pay for inserting articles, and especially where the sentiments are calculated to inflict an unjust injury upon another's interests.

H. H., of Conn.—The reason why some people are near-sighted is because the cornea of the eye is so prominent, that the image of distant objects is formed before it reaches the retina, and is therefore not distinctly seen. You will find this subject familiarly illustrated in Brewer's Catechism, designed for pupils.

R. E., of C. W.—Don't send us any Canada stamps, we have no earthly use for them. Send Canada bills, they are good enough.

G. E., of Ohio.—We have carefully examined your invention, and find it not patentable. Throckmorton's patent on planing machines covers the point claimed in yours.

C S. F., of Iowa.—You had better address W. & B. Douglas, of Middletown, Conn., for such information as you require respecting the ram.

C. R., of N. O.—Yours has just come to hand.

J. C., of Ohio—Yours will appear next week.

J. C., of N. Y.—You have not explained fully the mode by which your cam operates the slide rod. You are aware that the cam is employed on the Mississippi steamboats. We like the link motion, for slide valves.

W. W. B., of Md.—We have older records of the Reaper than the one you have sent, but we are much obliged to you, and will have occasion to use the information at some future time

T. J. A., of Ill.—Simply attaching weights to the sails of wind-mills could not be made the subject matter of a patent.

W. D. B., of Mass.—Your device for rolling metal we think is new and patentable.

A. M, of Vt.—A. Small's patent, of 1848, covers your your invention, therefore you cannot obtain a patent.

J. P A., of Ky.—The stuff for keeping the polished iron parts of a steam engine bright, is oil, and frequent rubbing up, nothing else. You can keep polished iron bright, by using copal varnish; put on a thin coat. This varnish, we suppose, you can get in any drug store in Louisville.

W. M., of N. Y.—Yours is not a patentable subject—if you published a book you could copyright the plan and tables, or you could copyright the tables. The discovery is a philosophical principle, for which a patent could not be obtained.

S. R., of N. Y.—The article "Effects of Steam on Timber," which you see going the rounds of some papers, as original, is taken, word for word, from an old article in the Sci. Am.

T. H. R., of Ala.—Francis Wolle, of Bethlehem, Pa., is the inventor of a machine for making paper bags, you would do well to address him for a description, or you will probably see it illustrated in the Sci. Am. some time during the present volume.

H. O. R., of N. Y.—The work upon telegraphs is in our library, you can examine it at any time; it is in the French language.

S. S. B., of Va.—There is no such rule as the one you speak of, for calculating the horse power of a water wheel by its size. An overshot wheel 20 feet in diameter if it is propelled by 6 cubic feet of water per second, is only 9 1-10 horse power; if it consumes 20 cubic feet per second it is a little over 30 horse power. The power of a fall is according to its height, and the quantity of water discharged in a given time. Multiply the height in feet by the number of cubic feet discharged per minute, that by 62 1 2, and divide by 33,000, and you have the nominal horse power; the actual will be more than 25 per cent. less.

R. C., of Ct—Visitors at the fair of the American Institute are pouring in from all parts of the country. The exhibition is worth your attention as there are many improvements in railroad enginery and apparatus.

R. E., of Pa.—We have delayed our answer to your inquiry respecting the brake until we could examine the one you refer to. We find the model on Exhibition at the Fair embraces the same arrangement, precisely, as yours, but you need not be alarmed for neither of them are new. We find that the same device was patented in 1847.

G. H. D., of Ct.—It is singular that so old an inventor—one who has taken out so many patents—should not have discovered earlier that such claims were good for nothing.

C. C. L., of Mass.—Yours will be answered at a very early date.

R. V., of Ky.—Your plan for an improved brick press appears to be good; it is patentable.

R. R., of N. Y.—Your communication will be attended to in due season. You see the right point.

Z. S. D., of Mass.—The thoroughly dried sawdust should protect wrought iron; we have never seen it tried, but believe it will answer; charcoal dust will do it.

S. A. L., of S. C.—You have been effectually anticipated in your ideas, for the truth of this see number 48, last volume. This, you see, contradicts the statements that you have "read the Scientific American carefully for two years, and it contains nothing like it."

F. B. H., of Ind.—Before we received your letter of the 1st inst., we had transmitted your specification and drawings to the Patent Office, therefore you will be obliged to wait the issue of the patent before having an engraving appear in our columns. We think a patent will be issued, but cannot tell when. Tell your friend that his carriage wheel is old. Take our advice and remain easy until you learn the result of your present application before putting more "irons in the fire." You have ingenuity, take care and not confuse it by too many ideas. Your letter we will preserve for further reference.

Money received on account of Patent Office business for the week ending Saturday, Oct. 9:—

L. N. L., of Mass., $30 . D. & S., of N. H., $45; R. H. T., of S. C, $300; F. J. P., of N. Y., $20; J. E., of R. I., $10; R. L., of N. Y., $55; E. Van C., of Pa., $5; R. C. B., of Ill., $200; J. S., of Miss., $30; G. B. D., of Mass. $30; A. M., of Pa., $35; J. B. A., of S. C., $55; J. G. P., of R. I., $30; L. B. B., of Vt., $25; M. & E., of ——, $40; F. & B., of N. Y., $58; E. L. G., of N. J., $30; S. R., of N. Y., $20, C. W. G., of N. Y., $20; C. G., of N. Y., $60; E. M., of N. Y., $30; H. & L., of Ct., $25; C. W. C., of Ohio, $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Oct. 9:—

A. F. P., of Mass.; D. & S., of N. H.; J. G., of N. Y.; J. J., of N. J.; J. E., of R. I.; S. & R., of N. Y.; L. B., of Vt; M. De LaC., of Spain; F. C. G., of N. Y., (2 cases)

Cheap Postage—Important to subscribers.

The amended postage law, as enacted by the last Congress, having gone into effect on the 1st inst., we take occasion to make an extract from one of the sections, from which our mail patrons will see that the item of postage on the Scientific American will in future be less by one-half than formerly.

"Any periodical or newspaper, under three ounces in weight, can be sent to any part of the United States for one cent, and if paid quarterly or yearly in advance, either at the office of mailing or delivery, will be transmitted by the mails for half a cent each number; that is, for a daily paper, the postage will be only thirty nine cents a quarter, or one dollar and fifty cents a year; a weekly paper or periodical will be charged only six and a half cents a quarter, or twenty-six cents a year. If the weight does not exceed an ounce and a half, it may be circulated in the State where published at half of the above rates."

According to the above extract, subscribers to the Scientific American, residing in the State of New York will receive their papers by mail at thirteen cents per annum, instead of thirteen cents per quarter as formerly, thus reducing the cost of the Scientific American thirty-nine cents per annum to mail subscribers—an item worth saving.

Subscribers in the most remote part of the country will be required to pay but six and a half cents per quarter in future for the Scientific American, and although some postmasters may insist upon higher rates, our patrons should resist the attempt to extort money from them by any pretended construction of the more obscure points in the statute which tends to such an end.

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 but 4 numbers, price, in sheets, $1.

Of Volume 6, all; price in sheets, $2; bound, $2,75.

Of Vol. 7, all; do do do

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office;—stating the name of the patentee, and enclosing one dollar as fee for copying.

Patent Laws, and Guide to Inventors.

We publish, and have for sale, the Patent Laws of the United States. The pamphlet contains not only the laws but all information touching the rules and regulation of the Patent Office. Price 12 1-2 cts. per copy.

SCIENTIFIC MUSEUM.

Mineral and Nitrogenized Manures.

It is well known that Liebig has favored what is termed the "Mineral Manure Theory," while the late Prof. Norton held different views, and believed in nitrogenized manures, that is, manure produced by decayed vegetable or animal substances. In England two farmers, Messrs. Lawes and Gilbert, have been experimenting to test the two kinds of fertilizers. Their experiments have extended over a number of years, and have been on quite a large scale. They took a field at the close of a four years' rotation, when the manures added at the commencement of the course were exhausted. On this ground they have cultivated wheat for ten years under various circumstances. One plot remained unmanured, and the produce of this served as a standard and starting point for comparison during the whole period. Thus, if its yield in 1845 was seventeen bushels per acre, the improvement over this in an adjoining plot, otherwise the same, was set down to the advantage of whatever manure had been employed. Such a system of cropping, continued for so long a time, affords results that are worthy of much confidence.

The first year's comparative practice was with various approved mineral manures alone. It was found that, with the addition of large quantities of these, the increase of product over the unmanured plot, was but trifling. In the next year the same character of mineral manures was employed, but with the addition in several cases of ammoniacal or nitrogenous substances; in all of these the effect was quite marked, the yield increasing to 10, 12, and 14 bushels above the unmanured plot.

This, in short, was the character of all the results; sometimes ammoniacal manures alone were added, and then the increase was several times more than by mineral manures alone. One experiment was very striking. Four hundred weight per acre of Liebig's special mineral manure for wheat was applied to a plot and produced an increase of but about two or three bushels; upon this same plot, in the next year, a purely ammoniacal manure gave an increase of ten or twelve bushels. To make the experiment still more conclusive, no manure was added to this plot for the next crop, and the yeld then fell again almost to the original standard.

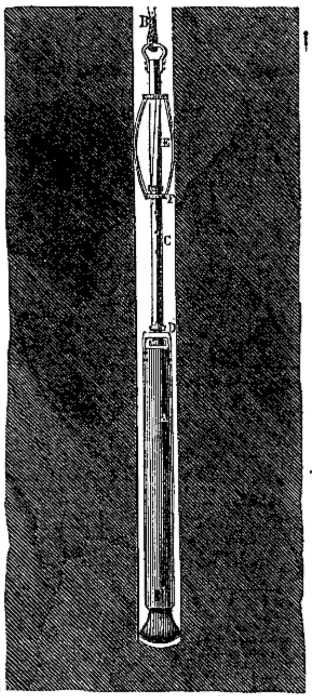
Gastric Juice.

At a recent meeting of the Academy of Sciences, in Paris, M. Cavisart read a paper on the "Alimentation of one Stomach by the Digestic Apparatus of another"—that is, the improvement of the digestion of weak stomachs by the addition of gastric juice taken from the stomachs of animals. Much has been said, studied, and written on this subject; but, as yet we have few, if any, facts tending to throw light upon it. M. Cavisart brought forward no practical proof to sustain the theory, but appeared to have no doubt in his own mind that indigestion is caused by a deficiency of gastric juice, and that if this deficiency were supplied from the sources which he suggested, digestion would at once become perfect again. As gastric juice is, in its natural state, of a taste and appearance that would be repulsive to the patient, he proposed that it should be reduced to a powder or paste, and mingled with the aliments, and thus introduced into the stomach. He seemed to have no doubt that the gastric juice of an animal would in all respects supply the place of that of the human stomach.

Camphor an Antidote for Strychnine.

Dr. Pudduck, in a letter to the London "Lancet," states that camphor is an antidote to that terrible poison—strychnine. An intemperate man, by exposure to cold, was attacked with acute rheumatism, and while he was so suffering, strychnine was prescribed in doses of the sixteenth of a grain, given three times a day. By mistake the druggist divided the grain into six parts, with sugar, instead of sixteen powders. The first dose produced severe twitchings, and the second dose threw him into violent convulsions. A messenger was at once dispatched to Dr. Pudduck, with the intelligence that his patent was dying. He hastily went to him and discovered the mistake by the frightful paroxysms of the sick man. No time was to be lost, he at once prescribed 20 grains of camphor in six ounces of almond mixture, to be taken every two hours. The first dose completely quieted the convulsions, and there was no need of a second.

Thomson's Artesian Well Borer.



This engraving represents the Artesian Well Borer of John Thomson, of Philadelphia, for which a patent was granted on the 30th of March last.

A is a cylindrical iron bar, nearly filling the bore-hole, and about five feet long; to the bottom of this is attached the chisel for drilling. On the top of this cylinder, at D, is a swivel, with a square iron bar, about four feet long and one inch diameter, passing through an eliptical steel spring and fixed to the rope, B. the eliptical spring, E, is of four strips, 18 or 20 inches long, and embraces the sides of the bore-hole in the rock, the lower disc of which has a round, and the upper a square hole for the bar, C, to work in. It will be observed that there is a twist of about a quarter turn upon the upper end of the bar, C, and a ring or shoulder, movable at pleasure, is fixed upon this bar and within the spring, as represented at F. The spring, E, acts as a brace by pressing outwardly and remains in a fixed position while the machine is at work. Various methods may be adopted for working this apparatus either by manual power or otherwise, as all that is necessary is to raise and drop the machine about 18 inches, more or less, by means of the rope from the surface of the ground.

The figure in the engraving represents the machine suspended in the hole in the rock, having been raised a little; its operation is as follows:—The power from the top, by pulling the rope, lifts the whole, except the spring, E (the bar, C, merely passing through it); but as C is a square bar, and the top disc of the spring has a square hole neatly fitting it; and as there is a twist upon that portion of the bar, it follows, as a matter, of course, that the whole apparatus (except the spring) will turn round a portion of a circle when rising, agreeable to the twist upon said bar. Having thus raised it 18 inches, the shoulder on C, represented within the spring at F, will be nigh the top of the spring, and the next action is the drop, which must be done in the freest manner, when down comes the weight, A, exactly in the same position in which it was suspended, without in the least following the back course of the twisted bar which merely resumed its former position in the fall. This straight drop of the heavy weight was obtained from the swivel, D, for although that swivel lifts the weight and bears it round with itself in the rising, it will be observed that there is no weight upon it whilst in the act of falling, as the bar, C, comes down as quick as the bar, A. In raising for the second stroke, the heavy cylinder, A, with the chisel is swung round another portion of a circle by means of the twisted bar passing through the spring, and being suspended freely in the middle of the bore-hole, the drop is perpendicular and in the position in which it is hung. The spring is gradually carried down as the boring proceeds. According to the nature of the rock, the chisel will make any number of strokes or cuts for each revolution by shifting the shoulder, F, to another position upon the bar, C, which allows more or less of the twist to pass through the spring.

To clean the hole or boring, the machine is wound up by the rope to the surface and the cleaner substituted for the chisel.

A Committee of the Franklin Institute, Philadelphia, examined this machine at work last month, they reported that it was a great improvement on the Chinese mode of boring artesian wells, and considered it the best instrument in use for that purpose. Any size of hole may be drilled with it, and it will work for a few feet in depth or many hundred feet, by simply lengthening the rope. Any kind of power may be applied to work it, and a good machinist can construct one. The common chisels and cleaner are used, but are modified to suit the machine. The cleaning out of the hole is done rapidly, as there are no rods to detach as in the common machine. An advertisement of Mr. Thomson will be found in the first and second numbers of this volume of the Scientific American. The claim is for the spring brace and the twisted bar, and will be found on page 238 of our last volume.

More information about instruments, and the sale of rights may be obtained by letter addressed to Mr. Thomson, No. 75 Otter st., Kensington, Phila., Pa.

The Great Storm in August.

Professor Gibbs, of the Charleston (S. C.) College, has published in the Charleston Courier some speculations and observations on the great August storm. He says that similar storms have occurred with more or less violence, at different points in the same general range, for the last three years, on very nearly the same day of the same month. Anticipating the advent of the one this year, he kept a meteorological register; and distinct evidence of its approach was given by the barometer on the 23d of August, four days before it reached Charleston. Observing this, he prevented some friends from going on a sailing excursion, who would have otherwise been lost. After some statements as to the variations of the barometer, he says the course of the storm may be derived from the following facts obtained from the journals, though they are not sufficient to assign with great precision the path of the centre of the storm, regarded as a revolving and progressive atmospheric disturbance:—

At Key West the storm prevailed during the 22nd; the wind at N. N. E., shifting to E. S. E.

At Mobile, on the evening and night of the 25th and the morning of the 26th, until noon; wind from S. E., shifting to S., then to W., to W. N. round to N.

At Pensacola, storm severe on the 25th and 26th, wind E., then S., then W.

In upper part of Georgia, heavy fall of rain on the night of the 26th and morning of the 27th.

At Charleston, high wind on afternoon of 27th and until after midnight; wind S., very little rain.

At New York, violent wind on the night of the 28th and 29th; course of wind not given.

At Boston, storm during the 29th; course of wind not given; fall of rain in that region 3¼ inches.

From these facts Prof Gibbs infers that the centre of this storm, originating east of the Island of Cuba, passed over the northern portion, or perhaps the middle of that Island, pursuing a tract nearly westward, reaching Matanzas about noon on the 22d; thence curving towards the north in a semi-circular path through the eastern part of the Gulf, at the rate of about ten miles an hour, reached Mobile about midnight of the 25th and 26th, or a little later, thence northwardly, north-north-easterly, and north-easterly through Alabama, northern part of Georgia, near Tennessee and North Carolina line, into Virginia, reaching the interior about noon on the 28th; thence north-easterly to New York, at midnight on the 28th, and to Boston at noon on the 29th, its velocity during the terrestrial part of the course being from twelve to fifteen miles per hour, and taking just one week for its travels from Matanzas to Boston.

[The storm commenced in New York at 5 P. M. on the 28th August, and it was most severe between 7 and 10 P. M. It commenced to blow from the south, was in the east at 7 o'clock, continued in that quarter for five hours. It shifted to the north, and was in the west the next morning. The rain came not in drops but in sheets. The storms around New York are mostly rotary, and the rain comes either from the south or east.

A Man in the Air.

Wonderful events always take place in obscure corners, thus foreign papers contain accounts of a curious balloon ascent from some out-of-the-way place of a small town on the frontiers of Spain. It is stated that a Spaniard named Antonio Moles made a small balloon without any car, except a small table, on which he lay down like a boy on a sled. Upon his legs were two umbrellas, so to speak, acting freely upon their sticks, and in each hand was a set of silken screens, opening with hinges and expanding or contracting at will. A rope, attached around his neck, communicated with the valve of the balloon, and around his body was a belt containing six or seven pounds of shot for ballast. Upon cutting himself loose from the earth, the balloon rose gently some two hundred feet, the atmosphere being perfectly calm. The aeronaut then commenced a motion very much resembling swimming, and the balloon began to fall off with considerable rapidity, the speed increasing as the machinery of impulsion began to work more freely. He went five miles in a straight line, and then returned, performing the whole ten miles in 29 minutes.

E. Walker, of Philadelphia, has raised a new kind of potatoe, which yields about six times more than the Mercers, and is of a better quality.