Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS.

VOLUME X.] NEW-YORK MARCH 10, 1855. [NUMBER 26.

THE

SCIENTIFIC AMERICAN,

PUBLISHED WEEKLY

At 128 Fulton Street, N. Y. (Sun Buildings.)

BY MUNN & COMPANY.

O. D. MUNN, S. H. WALES, A. E. BEACH.

Agents.

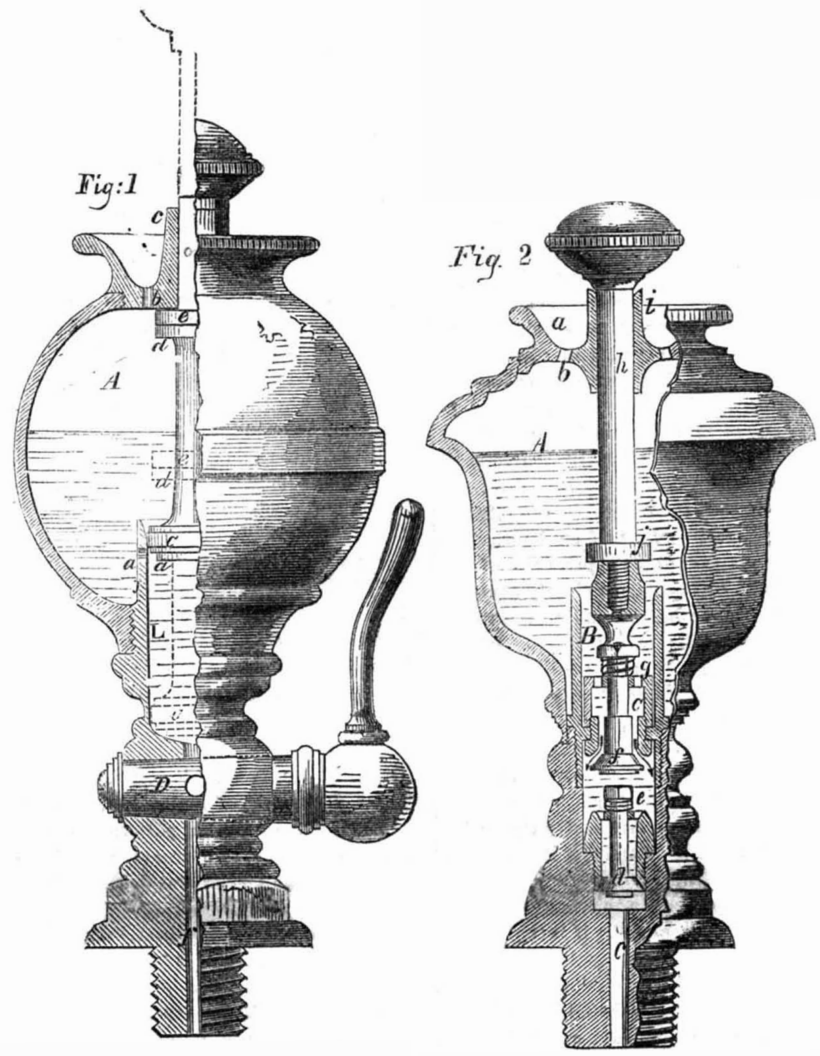
Federhen & Co., Boston. | Dexter & Bro., New York.
Stokes & Bro., Philadelphia. | E. G. Fuller, Halifax, N. S.
S. G. Courtenay, Charleston. | S. W. Pease, Cincinnati, O.
Avery Bellford & Co., London | M. M. Gardissal & Co., Paris.

Responsible Agents may also be found in all the principal cities and towns in the United States.

Single copies of the paper are on sale at all the periodical stores in th s city, Brooklyn and Jersey City.

TERMS—$2 a-year :—$1 in advance and the remainder in six months.

SUTTON'S LUBRICATOR FOR ENGINES.



Grease Feeder.

The accompanying engravings are views of improved grease feeders or lubricators for steam engines, for which two patents were granted to John Sutton, of this city, on the 16th and 23rd days of January. Figure 1—the feeder No. 1—on the 16th, and figure 2—feeder No. 2—on the 23rd.

In figure 1 the oil or grease is forced from a reservoir into the engine by a piston working in a cylinder. By the peculiar arrangement of passages, between a cylinder and reservoir, a solid piston may be employed without using a valve cock.

A is the reservoir containing the oil or other grease, in a fluid state; L is the cylinder, and C the piston. The reservoir is, or may be, of about the same form and size usually employed for similar purposes, and is supplied with oil through holes, *b b*, in the bottom of a small cup above it. The cylinder is placed in the bottom or lowest part of the reservoir, with a portion more than equal to the depth of the piston, standing above the lowest part of the reservoir, in order that passages, *a a*, through which it has communicated with the reservoir, may be left open, when the piston is raised above them. The total depth and diameter of the cylinder will depend on the quantity of grease to be injected at one time. The piston may be made and packed in any well known manner. Its rod passes through a guide, *c*, in the top of the reservoir, which guide also serves as a vent tube, and outside of this guide it is furnished with a knob or handle. It is also furnished below the guide, *c*, with a collar, *d*, to prevent its being drawn too far upwards; and above this collar a spring, *e*, of india rubber or other material, is fitted around it to prevent its concussion against the guide, *c*, when the piston is drawn up. Below the cylinder, L, is a tight passage, *f*, leading to the steam cylinder or other part to be lubricated, and this passage is opened and closed by a common stop cock, D, or may be fitted with a valve, in place of the stop cock. When the reservoir contains oil, if the cock, D, is shut, and the piston is drawn upwards by hand from the position shown in dotted lines, or any where below the passages, *a a*, a vacuum will be formed in the cylinder, and after the piston passes the said passages, the oil will be caused, by the pressure of the atmosphere and by gravitation to rush through the said passages into the cylinder, and fill it. Before opening the cock, for the oil to enter the steam cylinder or other place where it is required, the piston should be forced down far enough to close the passages, *a a*, having done which its further descent will be stopped by the oil itself. The cock may be then opened and the piston forced down far enough to drive the whole, or part of the contents of the cylinder, L, to where it is required.

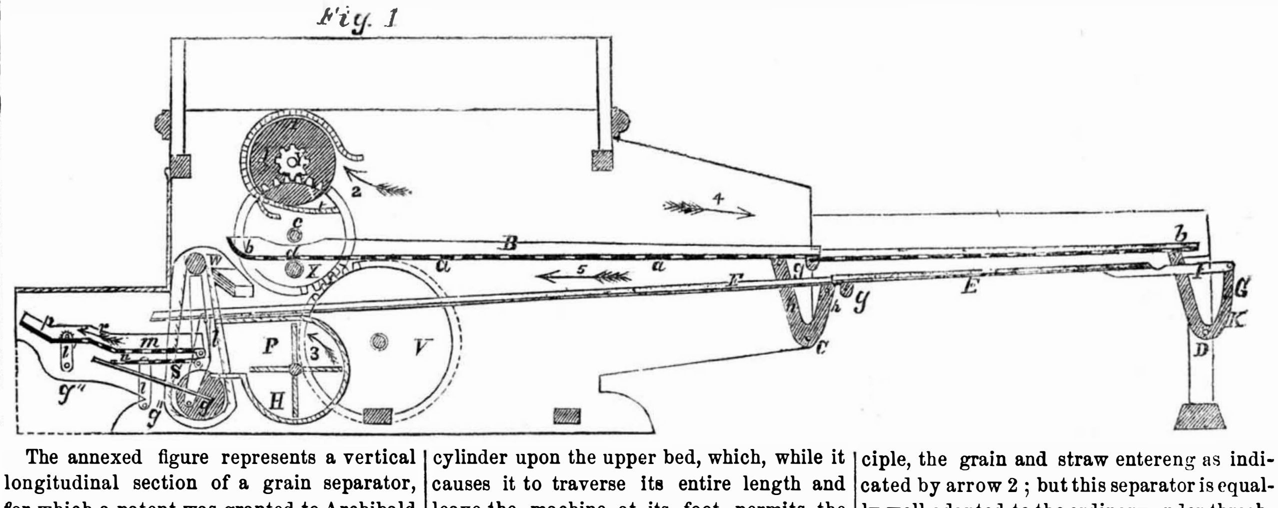
By providing the passage, *f*, with a valve, closing with, and opening against the pressure of steam, the turning of the cock may be dispensed with, as the valve will be opened by the pressure produced on the oil in the cylinder, by the force applied to the piston.

The second patent, illustrated by figure 2, is the arrangement of the cylinder and piston of the grease feeder in the bottom of the grease or oil reservoir, thus rendering it more compact, also an arrangement of valves, whereby the feeder is charged with oil or grease, and discharged into the engine by simply moving its piston back and forth.

A is a grease or oil reservoir; B is the cylinder, and C the piston. The reservoir is supplied at the top through openings, *b b*, in the bottom of a small cup, *a*. This cup forms a covering to protect the oil in the reservoir from dirt. The cylinder, B, may be cast with or fitted into the reservoir, being placed in the center of the bottom. It may stand up within the body of the reservoir, as shown, or be entirely below it, but is preferable that it should stand up some distance above the bottom of the reservoir to leave a space around it for the collection of sediment, and to prevent any dirt injuring the surfaces to be lubricated. The upper end which enters the reservoir is open, and from the lower end leads the passage, *c*, through which oil is ejected from the reservoir against the pressure of steam. At the entrance to the passage, *c*, there is a valve, *d*, which will be closed by the pressure of steam, but has a spring, *e*, applied to it, to prevent it opening, and allowing the escape of oil, when the engine is not in operation. The piston, C, is hollow and furnished with a valve, *f*, which opens downwards. This valve has a spring, *g*, applied to close it. The piston rod, *h*, works through a guide, *i*, in the center of the top of the reservoir, and is furnished with a knob or handle outside. At a suitable distance above the piston, an india rubber or other spring, *j*, is attached to the rod in order to serve as an elastic stop to arrest the upward movement or retraction of the piston. The guide, *i*, is intended to serve as a vent in filling the reservoir, and should reach above the top of the cup, *a*, and the piston rod should fit it easily. The oil is fed by simply retracting the piston by hand from the discharge end towards the entrance of the cylinder, and then returning it. The retraction of the piston causes a vacuum to be formed in front of, or below it, and thus causes the valve, *f*, to open, and the oil to rush from the reservoir through the piston, the valve, *d*, in the mean time, remaining closed. The return of the piston causes the valve, *f*, to close, and the valve, *d*, to open, and the oil below or in front of the piston to be ejected through the passage, *c*. The arrangement of the cylinder and piston of the feeder within the reservoir, with a guide for the piston rod in the top of the reservoir not only makes the feeder more compact, but simplifies the construction. The arrangement of the two valves in the piston and discharge end of the cylinder, enables the oil to be fed while the engine is running, by one movement back and forth of the hand of the engineer, which in locomotive engines is a great advantage. All other feeders for similar purposes require two movements, either to open and close two cocks, or to open and close one cock or stopple, and move the piston.

More information may be obtained by letter (or otherwise) addressed to Sutton & Gregory, No. 114 and 116 Cannon street, this city.

BOWEN'S GRAIN SEPARATOR.



The annexed figure represents a vertical longitudinal section of a grain separator, for which a patent was granted to Archibald Bowen, of Wadesville, Clark Co., Va., on the 24th of October, 1854.

The nature of this improvement consists in combining two reciprocating beds, the upper perforated and inclined toward the foot of the machine, and the lower inclined in an opposite direction, so that the grain and straw shall be received from the thrashing cylinder upon the upper bed, which, while it causes it to traverse its entire length and leave the machine at its foot, permits the grain to fall through its perforations upon the lower bed, which by its inclination and reciprocating motion, carries the grain to the chaff-separating portion of the machine, where by blast and screens the grain is thoroughly cleaned. In the engraving, A is the thrashing cylinder, rotating as shown by arrow 1, and acting on the over-thrashing principle, the grain and straw entereng as indicated by arrow 2; but this separator is equally well adapted to the ordinary under thrashing machine. B is the upper bed, composed of sheeet metal, having the perforations, *a*, punched in it from the top, these perforations diminish in size from *b* to *b'*. The upper extremity of this bed is supported by the bar, *c*, which by reason of two cranks, *d*, or eccentrics, one at each end of the bar, revolves around the shaft, *e*, causing the end of the bed to rise and fall, and reciprocate longitu dinally, two straps, *i*, keeping the bed upon the bar, *c*, as the bar revolves. This bed is jointed at *g*, and is supported near that joint by the long arms, *h*, of two bent levers, C, placed one on each side of the bed. The extremity, *b'*, is supported by the arms, *k*, of two bent levers, D. The lower bed, E, which is a plain sheet of metal, inclines toward the head of the machine, and is supported by the arms, *k*, of levers D, arms, *h*, of levers C, and at the head by two levers, *b*, one on each side of the bed. The arms, F, of the bed, E, are jointed with the rods, G, connecting the bed, E, with the levers D, and through which motion is communicated to the bed E from the bed B. The levers, *b*, besides sustaining the head of the bed, E, also support one extremity of the screens, *m* and *n*, the other ends of these screens being supported by the levers, *b* and *b*, these levers have their fulcra at *g g' g''*. The termination of the screen *m*, is an inclined plane, *p*, connected with the screen by the steeper plane, *r*. P is the fan revolving, as shown by arrow 3, within the chamber, H. S is the elevators which receive the cleaned grain and convey it up the spout, W, where it is discharged into bags. The beds, B and E, are so constructed as to be capable of separation at *g g'*, for facility of transportation. V is the driving wheel which gives motion to the wheel, X, and through it the pinion, Y, for driving the thrashing cylinder and rotating the shaft.

The simplicity of the construction and operation of this machine, renders it a valuable improvement in grain separators, as the grain being received on the upper bed is thoroughly separated from the straw during its passage over the bed, and by the action of the bed, E, descends in the opposite direction to the mill, while the straw passes over the tail of the machine, thus effectually making the first separation. The second separation is no less thorough, as the grain receives the blast under the best possible circumstances to ensure the blowing off of the chaff, while from the confining of the blast above the screen, *m*, and the arrangement of the inclined planes, *r* and *p*, the liability of the grain to be blown off is greatly diminished.

More information may be obtained by letter addressed to the patentee, at Wadesville, Clarke Co., Va.

The Art of Dyeing—No. 11.

MANAGEMENT OF BLUE VATS FOR WOOL—The following are Dumas' directions for managing woolen blue vats:

A good condition of the vat is recognized by the following characters:—The tint of the bath is of a fine golden yellow, and its surface is covered with a bluish froth and a copper colored pellicle. On dipping the rake into the bath, there escape bubbles of air, which should burst very slowly; when they vanish quickly, it becomes an indication that we must add more lime. The paste which is found at the bottom of the vat, green at the moment of its being drawn up, should become brown in the air; if, however, it remain green, this is a further sign that more lime is required. Lastly, the vat should exhale the odor of indigo. We usually complete the assurance of the vat being in a good state by plunging into it, after two hours' respite, a skein of wool, which, on being withdrawn after the lapse of half an hour, should present a green color, but change directly to blue. We then once more mix the materials of the vat, and two hours after it may be considered ready for dyeing.

These vats, like those already described, are provided with a large wooden ring, the interior of which is armed with a kind of network, for the purpose of preventing the objects which are intended to be dyed coming in contact with the materials at the bottom of the vat; we, moreover, take the precaution of enclosing the wool or cloth in bags. These tissues, when plunged into the bath, should remain there for a longer or shorter time, according to the shade which we wish to obtain; one dipping, however, will never suffice for this object; usually we leave in the stuff for half an hour only; it is then to be taken from the bath, wrung, and exposed to the air. This operation is repeated until we have succeeded in procuring the desired shade; we ordinarily suffer three hours to elapse between each dipping. The heat of the vat should never be allowed to fall below 130° Fah. After each operation the bath must be well stirred, and fresh lime added; generally speaking, a pound a day will suffice; we re-establish the indigo about every second day. When once this vat is well mounted, and we are careful to examine its working, we may dye from two to four batches a day with it.

When the stuffs have acquired the desired shade, they are first to be washed in common water, and then in a very weak solution of hydrochloric acid (about one part in a thousand); after this they are again rinsed in pure water.

The Indian vat is much more easily managed than the foregoing; it presents less danger of failure, from the fact that it is quickly exhausted, and also from the fermentative process, which is so difficult to govern in the pastel vat, here not having time to change in character. It is prepared by first introducing an equal quantity of madder and of bran, and a triple quantity of potash; this is to be gradually heated until it reaches a temperature of 167° Fah., and we then add to it the indigo, thoroughly agitating the matters for half an hour. The vat is maintained at a temperature of 86° to 100° Fah., by keeping it closely covered, and at the same time the mixture is to be stirred occasionally at intervals of twelve hours. It should by this time present a beautiful green shade, the liquor being surmounted by a copper-colored pellicle and a purplish froth. We may now commence the dyeing, following the same course as with the pastel vat; but the stirrings being here repeated much more frequently than with the other mixture, we can dye a larger quantity of wool within a given time. When the vat ceases to give a brilliant blue, we must altogether renew it; if it be merely weakened, we add to it a small quantity of freshly prepared liquor containing a few pounds of potash, and a little less bran and madder. In giving the dark and clear sky-blues, we must be careful to employ a quantity of indigo proportioned to the color which we wish to obtain, or, better still, we may use the previously exhausted vat for the dark blue.

When exposed to the influence of the putrid fermentation, indigo is decomposed and loses its color. If rendered soluble, it obeys the impulse communicated to the azotized matters with which it is brought into contact, although, if macerated in pure water at the ordinary temperature, it is itself decomposed with great difficulty.

The pastel and the woad are very subject to the putrid fermentation, by reason of the large quantity of azotized matters which they contain, as do all the cruciferæ; they require, therefore, considerable care in their employment.

When a vat is mounted, if the fermentation be allowed to continue unchecked, after the appearance of the blue froth and the other signs already indicated, the liquor will acquire a yellow color similar to that of beer; the froth will become white; it will give out a stale smell and lose its ammoniacal odor; after a few days it will turn whitish, and exhale a smell at first similar to that of putrefied animal substances; then it will acquire the odor of rotten eggs, and set free sulphuretted hydrogen. The lime in the pastel and the woad vats, and the tartar-lye and potash in the other mixtures, are used for the purpose of preventing these accidents.

Besides the oxygenated compound, which is formed by the combination of oxygen with the extractive matters of the plants held in digestion, there is a production of carbonic acid which saturates the alkaline lye, and forms a carbonate of lime in the pastel vat. We find this attached to the sides of the vat in such quantity, that the inside of these vessels becomes incrusted with it to a considerable depth. It is this product which dyers call the tartar of the vat; it effervesces with acids, and gives on analysis carbonic acid, lime, and a few particles of indigo. In the potash vat the solubility of the carbonate of potash prevents its deposition; but it is very probable that we have even here a formation of some carbonated products, perhaps in part formed at the expense of the carbonic acid of the air.

The soluble extractive principle being the only matter which remains in solution in the bath with the indigo, the lime, &c., we have formed deposits which, varying both in their volume and in the greater or less facility with which they are precipitated during the various periods of fermentation, lead to a more or less considerable waste of time. If we plunge a piece of woolen tissue into a vat which has been recently stirred, it will acquire a dark color, and will be found covered with brown stains which are with difficulty removed. When the woad or pastel vat has been stirred, it need be left only two or three hours before plunging in the stuff at least during the early months of its working, inasmuch as the pastel, being but slightly divided and attenuated, is readily precipitated; but when, by reason of its extreme division, in consequence of repeated operations, it is thrown down with less facility, the dipping should not be performed oftener than three times in the day.

The Indian vat requires less time than the others; we may even dye with it an hour after stirring the mixture. The potash, being soluble, forms no precipitate; while the ligneous fiber of the madder and the pellicles of the bran become deposited with great facility. We can also dip with these vats much oftener than with those made by pastel or woad.

DYING RECEIPTS—We have received from Thomas J. Stevens, of Plainfield Academy, Plainfield, Pa., a beautiful pattern of scarlet and one of orange, of coarse wool. He informs us that the scarlet was dyed by directions in the SCIENTIFIC AMERICAN, and the orange by adding quercitron bark to the spent scarlet dye. This is evidence of the practicability of the receipts given. The patterns sent us by Mr. Stevens, we assert, cannot be surpassed in brightness and richness by any others in our country.

To Cure the Croup.

A writer in the *Country Gentleman* gives the following prescription for the croup:—Divest the child of all clothing about the neck and chest; then bathe the throat and upper part of the chest freely with cold water. Let this be done by pouring, sponging, or very frequent application of wet cloths. While this is being done, prepare warm water, and immerse the feet in it. This gives relief in a short time; the child should be put quietly to rest, with a jug of warm water to the feet, when perspiration and sleep soon follow. Any one can follow these directions immediately, and it is a complaint which is soon fatal, unless checked in the early stages, and many precious lives are lost because a physician is not at hand until it is too late to save from suffocation.

American and English Flour

The following is from Dr. Sheridan Muspratt's recent work on chemistry applied to the arts, published in Glasgow:—

"Many English millers are much opposed to moistening the grain previous to grinding it, and even dry damp grain upon a kiln to deprive it of its acquired humidity; the flour which they obtain, though inferior in color to other varieties, is better adapted for storing and exportation than any other. The American flour is decidedly the whitest brought into the market; this must be owing to their more perfect sifting machinery, and cannot be from the better quality of their grain, as it is universally allowed that English wheat is seldom or never surpassed. The Americans cool their flour very rapidly by means of special machinery, while the English miller leaves it to cool in the sack, on which account it feels gritty to the touch. The best and most expedient way of securing a flour of the whiteness of the American article, and possessing at the same time the durability of the English, would be to grind the grain slightly moistened, as is the custom of the American millers, and afterwards dry the flour at an incipient heat in properly constructed chambers; the excess of moisture would in this way be expelled, and the husk or bran would be more completely detached from the flour.

This method has been tried, in the event of shipping the product to a distance, with very favorable results. On the whole, English millers obtain a larger bulk of flour than the Americans, but the latter produce as much as four per cent. of the first quality over the English. Bran, as it comes from English mills, only slightly whitens black cloth, but the American bran retains considerable portions of the matter of the grain attached to it."

Pianofortes.

The nature of the improvement on pianofortes, for which Henry S. Ackerly, of this city, has just attained a patent (as recorded in our list of claims,) relates to a certain arrangement of the wrest plank or turning block, and the strings of a square pianoforte, for the purpose of enabling the strings to be carried and sustained by a metallic frame, which is independent of the case, and the case to be relieved of their strain, and the power and durability of the instrument to be increased without enlarging it. The wrest plank, instead of being placed at the back of the instrument, as is usual in the square pianoforte, extends partly along the front, and diagonally along the front left hand corner, one diagonal part being more elevated than the other, for the purpose of allowing the strings to be arranged in two tiers.—While this arrangement allows of the case being made no larger than usual, by the arrangement of the strings, the shortest key is brought opposite the shortest string, and the longest over the longest string, which requires the hardest blow; this is the reverse of the common square piano.

Shaved Treenail Wedges.

R. C. Jones, P. M., of Alna, Lincoln Co., Me., has sent us a few samples of shaved tree-nail wedges, made in a machine invented by Jones & King of that place. They appear to be superior to the sawed tree-nail wedge, not being so liable to cripple while driving. This is the character given to them by experienced ship builders. They are also of a wedge form edgeways, which, when driven, causes them to fill across treenail holes without leaving any space between the edge of the wedge and side of the hole, which sawed wedges often do, They are worthy the attention of the shipbuilders in this city.

British Shipping.

A parliamentary paper which has been issued states that the number of British sailing vessels employed in the trade of the United Kingdom in 1851 was 17,664, whose aggregate tonnage was 3,216,194 tuns, and on board of which 131,277 men were employed. In 1852 the number of vessels was 17,270, their tonnage 3,215,665 tuns, and their crews 146,286 men. With respect to British steam-vessels, 520 were employed in 1851 in the trade of the United Kingdom (excepting river steamers) whose tonnage was 144,741 tuns, and the number of their crews 10,660. In 1852 the number of steam vessels so employed was 549, their tunnage 165,219 tuns, and their crews 13,277 men. Repeated voyages, of course, are not included in the above returns.

The last number of *Silliman's Journal* contains a severe review of Prof. Emmons' Agricultural Report of New York.

Nine hundred and fifty-three fires took place in London in 1854. This is almost as many as we had in New York. Still London is not quite smart enough for us yet.

By mixing some finely pulverized charcoal with the food of turkeys, they fatten sooner, and their meat is improved in flavor.

For the Scientific American.

Lateral Motion of the Earth.

I think the following will cover the vacancy in H. Pollard's system of geology. It is admitted by those conversant with astronomy, that the earth has seven motions, a daily, an annual, a vibratory, by the joint action of the sun and moon; another by the shifting of the perihelion and aphilion points, another by the precessions of the equinoxes, a nutatory by the action of the moon on the polar regions.

Laplace, the greatest astronomer of his day, says the instant when the great axis of the ecliptic is perpendicular to the right line of intersection of the equator and ecliptic it is 169°, 6′, 27″ east of Greenwich, and should be the first meridian.

Then let a terrestrial globe be prepared with the system of the ecliptic described on the poles as fixed by Laplace; the north pole of the ecliptic being in the polar circle, and the winter solstitial colure or first meridian, 10°, 53′, 33″ west of Greenwich. A circle drawn from this pole as a center on a radius of 23°, 28′, will pass through the pole of the earth, and trace its line of motion round the pole of the ecliptic in 25,920 years.

This revolution of the pole of the equator round that of the ecliptic is admitted by all astronomers to take place in the heavens, but not in the earth. They admit, too, that the axis of the ecliptic is fixed and immovable, the ecliptic being so; but they have not yet shown how a right line intersecting another fixed right line at a given angle shall move round the latter at its extremity, and not at a given distance from the point of intersection. Assuming, then, that the pole of the equator revolves round the pole of the terrestrial ecliptic, it remains to show a few of the effects of such motion.

By inspection of the globe we find that the pole of the equator is now at nearly its greatest distance from western Europe; that it is advancing at the rate of about 394 yards annually on North America, and will pass through Lancaster Straits, Hudson Straits, over Resolution Isle, enter Europe at Cape Finisterre, pass through France over Toulouse, through Russia, over Moscow, &c., &c. It is found that the solstitial colures are almost entirely in the ocean, cutting only a small portion of western Africa, and a portion of Kamtschatka, and proceeding without interruption until they meet the lower part of New Zealand. On inspecting the globe further we find that Kamtschatka was at a given period within the tropics, which accounts for tropical fossils being found in the polor regions, and that the Ural Mountains were formerly in the latitude of California, which explains why the precious metals are found in such high latitudes, and why the same precious stones are found in Mexico and the Ural Mountains. We find, also, that the direction of the straits in the higher latitudes run from west to east, or in the direction of the waters of the pole. The debris of mountains are found in the same direction. They are generally bold and precipitous on the west facing the current, while the drift settles on their eastern base, consequently there are few long rivers that enter the ocean by a western course.

The radius of the earth at the equator is about 65,000 feet greater than the polar radies, owing to the centrifugal force (which is as the radii of the parallels of latitude.) And, as the pole moves through 46°, 56′, of latitude in 11,960 years, in that lapse of time one part of the equator will be carried 46°, 56′ into the southern hemisphere. At that period all western Europe will be buried under the waters of the pole (forming the period of a deluge.) This change of the plane of the equator is probably the cause of all the great phenomena; it changes the latitude from polar to tropical regions, and thus renders a change in the action of the centrifugal force; and from whatever part the pole is receding, the centrifugal force is increasing, which produces an alteration of surface; in whatever place it is advancing, there is a consequent depression. There is thus a daily tendency to elevation in some parts, and to depression in others; and to this cause earthquakes and volcanic action may be attributed. According to this theory, as the elevation and depression must be greatest in the direction of the motion of the pole, so ought the degree of volcanic action to be. On inspecting the globe we find this to be the case, and that volcanic action is greatest on the meridians of South America and the Philippine Isles. Where no elements of combustion exist we have eruptions of mud, &c. The difference between the earth's radius at the equator and at 45°, is nearly 33,000 feet. Now, the equator changing its position nearly 47°, follows that in the solstitial colure, where the present position of the equator will be depressed at best 33,000 feet. This will readily account for marine fossils being found in Chimborazo, 15,000 feet above the surface of the ocean, and for its gradual subsidence on the plains of Missouri. JAMES EDI.

Verona, Wis., Feb. 23, 1855.

[We have received quite a number of communications on this subject. We may publish one or two more of them; but perhaps not.

Influence of the Moon on the Production of Earthquakes.

The Commission appointed by the Paris Academy of Sciences, composed of MM. Liouville, Lamie, and Elie de Beaumont, to consider the researches relative to earthquakes of M. Alexis Perrey, report that M. Perrey has established the fact that the unequal attractions of the moon on the earth, at its greatest and least distance from the earth, have a sensible influence on the production of earthquakes. In order to this, he has brought together the results of 7,000 observations, extending over the first half of the present century, and from the catalogues he has formed, shows by three ways, independent of one another, the influence of the course of the moon on the production of earthquakes.

1. That the frequency augments in the syzgies.

2. That the frequency augments in the vicinity of the moon's perigee, and diminishes towards the apogee.

3. That the shocks of earthquakes are more numerous when the moon is near the meridian, than when 60° from it.

The cause of the interest connected with these relations is easily understood. If, as is now generally supposed, the interior of the earth is in a liquid or pasty state through heat, and if the globe has for its solid part only a crust comparatively very thin, the interior liquid mass must tend to yield like the surface waters to the attractive forces exerted by the sun and moon, and there must be a tendency to expansion in the direction of the radius vectors of these two bodies; but this tendency encounters resistance in the rigidity of the crust, which is the occasion of fractures and shocks. The intensity of this cause varies, like that of the tides of the ocean, with the relative position of the sun and moon, and consequently with the age of the moon, and it should also be noted, that as the ocean's tides rise and fall twice in a lunar day, at periods dependent on the moon's passing the meridian, so in the internal fluid of the globe there should be two changes in a day, the time varying with the same cause.—[Mining Chronicle.

[It will be perceived that this theory of earthquakes differs from that advanced by Mr. Edi in the foregoing communication. The world is divided into two classes respecting the phenomena of earthquakes; one believes they are due to the interior of the earth being a hot fluid mass, the other to magnetic action—electric shocks.

The Ants of Texas.

MESSRS. EDITORS—As I feel greatly interested in regard to our Texas ants, I have concluded to give you a short description of them and their doings.

These ants have no uniformity of size, some being large enough to carry a grain of indian corn, while others are no larger than a flea: all the different sizes may be seen in the same train, the larger ones turning down the leaves, and the smaller ones cutting them up and carrying them to their den. In color they are a dark red. In shape they resemble the common large red ant but have a larger head; they carry their burdens on their backs, which are supplied with several sharp horns to keep their loads in place; their cutting teeth resemble a pair of shears in shape. I have seen four engaged in carrying a grain of corn up the inside of a barrel, and after they had it clear up hill, one would take it on his back and move off for the den. Their instinct is truly surprising; they live in towns or clusters of dens or cells; some cells are as large as a flour barrel and contain a half bushel of ants of all sizes and ages. They are supplied with large breeders similar to the bee; they burrow sometimes to the depth of ten feet, hence they are almost inaccessible to fire or sword.

One circumstance I will relate to show their numbers: I had a nursery of fruit trees attacked by them, and I concluded to try the burning of them in train; I burnt 3000 every day for one week, and still the stream continued; they live entirely on vegetables and but few kinds escape them, such as the fig, the mulberry, the pecan, and some few others, They are inoffensive, any further than their teeth are concerned, have no sting; dung hill fowls are fond of them, but as they—the ants—feed mostly in the night, but few are destroyed. I have tried to destroy them for four years, and have failed; I wish some Yankee would give them a pop. Sometimes one den will strip a peach tree in a night; a successful invention for their destruction would prove lucrative. M. B. R.

DeWitt Co., Texas.

(For the Scientific American.)

Alloys of Copper and Zinc.

I will endeavor to account for some phenomena enumerated in an article in the SCIENTIFIC AMERICAN of the 2nd December.—

That article mentions some curious phenomena connected with an alloy of copper and zinc in making castings of brass. It seems that the alloy in question had been obtained by the indiscriminate mixing of the two metals. Now it has been well established that these two metals combine in definite but various proportions, forming alloys which are distinguished by different properties. Thus if we take copper and zinc, melt portions of each together in a crucible, and then allow the mass to cool, we will notice during the cooling, that there are points at which the temperature will be at a stand, and then, after the lapse of a few minutes, the temperature will again begin to fall, and so on, until the whole mass has become solid.

Now each of these points corresponds to the crystallization of a definite compound of copper and zinc, which, of course, being of a different chemical constitution than the remaining portions, crystallizes at a higher temperature; and as the process continues we notice that the molten mass becomes granular, thus exhibiting the presence of crystals. In the case mentioned in the SCIENTIFIC AMERICAN, the copper and zinc were placed under circumstances favorable to this result, they did not exist in proportions to form one compound, but perhaps to form two or three. Now, as has been before stated, these have entirely different properties, are different in their specific gravities, and in their color, &c. A difference in their specific gravities would of course cause a separation, the lighter upon the top of the others, which would be poured off first. The first or the last casting of one pot of molten metal must have contained a different alloy from the other part of the casting, and this may have contained a small portion of another alloy, which would not crystallize at so high a temperature as the other, which latter crystallizing first, and the other afterward, would tend to produce an undue strain upon the casting, as is the every-day experience of the brass founder, where one portion of his metal cools before another. This I think will account for the phenomena mentioned.

JOSEPH L. BUTLER,

Philadelphia, Feb. 24th, 1855.

Raising of Bread, Cake, &c.

MESSRS. EDITORS—Allow me to make a few remarks on the article in No. 21, present volume, SCIENTIFIC AMERICAN, against the use of saleratus for raising of bread, and recommending yeast as the only safe article for this purpose. Saleratus, or more properly sal aëratus, i. e., air salt, is the name originally given to the carbonate of ammonia, a salt consisting only of carbonic acid and ammonia, and entirely volatile, slowly at the common temperature, but rapidly in a moderate heat. If this salt is used pure (without any admixture of soda) for raising bread, it is entirely volatilized, leaving nothing behind, imparting to the bread neither taste nor smell. There is, however, another way of making bread, cakes, &c., light, without the use of yeast. This is the use of bicarbonate of soda and pure hydrochloric acid in such proportions as to form chloride of sodium, or common kitchen salt. The bread made in this way has an excellent taste, and is much whiter than that made with yeast. The only objection to the introduction of this method into general practice is the difficulty of ascertaining, without trouble, the right proportions of the acid and soda. Flour has been prepared by mixing it in a machine with bicarbonate of soda and hydrochloric acid, so that it could be used for baking without any other raising. A. Z.

[We have tried bread made with hydrochloric acid and bicarbonate of soda, but it is not so sweet nor pleasant as that made by fermentation—we do not consider effervescence to be fermentation. A few years ago this mode of making bread was quite prevalent in this city, but it has passed away with the things that were. We believe, however, with our correspondent, that these are the most safe and best chemicals that can be employed for raising bread by effervescence.

More about Snails.

MESSRS. EDITORS—In reply to the question in the SCIENTIFIC AMERICAN two weeks ago, "who uses snails, and what are they used for?" I take the liberty of answering, and at the same time supplying some additional information to the communication on the same subject in the last week's number.

A certain kind of snails are consumed in Switzerland as we consume oysters here. The kind I refer to has a shell about one inch and a-half in diameter near the aperture. They are all about two and a half inches long when creeping on the ground; their color is gray. They are found about hedges, and are only eaten in autumn and winter, when in their dormant state. Monks and those professing the Catholic religion are very fond of them, as they are allowed to eat them upon fast days when flesh meat is prohibited. In some of the convents they have regular snail pastures, where they are raised in large quantities. They are boiled or roasted, and eaten with butter; their taste is excellent. I. LOCHER.

New York, Feb. 27th, 1855.

Speed of Circular Saws.

MESSRS. EDITORS—As the inquiry is often made, what is the best speed to run a circular saw, and as many persons have the impression the faster the saw runs the better, which I think is an error. A full tooth saw can be made to run so fast as to act as a buzz, and won't cut timber. A saw run on a high speed should have but few teeth; I think—from long experience—that five hundred revolutions per minute is fast enough to run a 48-inch saw. A 24-inch saw may be run one thousand revolutions per minute

THOS. J. FLANDERS.

Manchester, N. H., Feb. 21st, 1855.

To Cure Felons.

S. Osher, of Higganum, Conn., informs us that by keeping the felon finger in hot water for a long time, it will remove the pain. The water must be kept as hot as it is possible for the person to bear. He cured one on himself by this plan, and has known of it being equally efficacious with other persons.

New Inventions.

Hinge Machine.

The patent which has just been granted (the claims, seven in number, will be found in the weekly list on another page) to Charles Miller, of this city, for an improved machine for making butt hinges, covers a most ingenious and useful improvement for manufacturing such useful and necessary articles. Two blanks of metal are fed in, and then come out from it perfectly finished hinges, at the rate of 6000 per hour. The two narrow blanks of metal to form the hinges are fed into the machine opposite one another, and the spaces of one-half of a hinge are punched out, to receive the matching part of the opposite half, then bent to form the pivot or pin socket while approaching, and then when they meet, they are matched and locked into one another, cut off and discharged on a small table at one side, where a pin formed out of wire is thrust through the single hole formed by the bent and jointed leaves, then rivetted by a cam in the socket, forming the hinge, which is then discharged in a finished state. The separate operations to accomplish this object embrace very ingenious devices and arrangements of mechanism; a full description of the same cannot of course be given without engravings, but what we have said will give a general idea of the nature of the machine, and what it can do.

We have had the privilege and honor of first presenting to the public all the most useful American inventions, and many foreign ones, during the past nine years. This is a most important invention, and will effect a complete revolution in their manufacture, and be the means of greatly reducing their cost, and this certainly, will be a great benefit to our whole people.

Patents have been secured for it through this office in several foreign countries. A. D. Reed, of this city, owns one-half of the invention by assignment.

More information may be obtained by letter addressed to No. 118 East 25th street, this city.

Quarrying Slate.

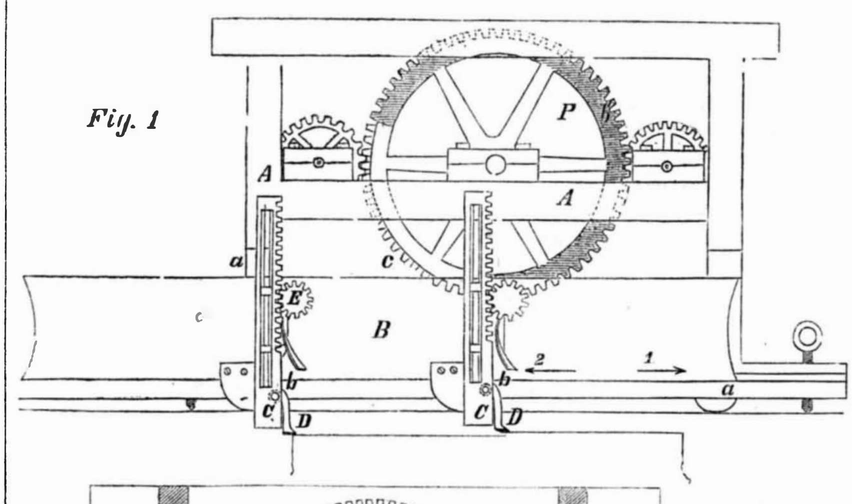
The annexed engravings are views of a machine for quarrying slate, for which a patent was granted to Henry J. Brunner, of Nazareth, Pa., on the 23rd of Jan. last.

Fig. 1 is a side elevation, fig. 2 is a longitudinal vertical section, fig. 3 a detached inverted plan of the toothed wheel and pinions, by which the reciprocating motion is given to the cutter stock. Fig. 4 is a top view of the cutter stock, and the pawls, ratchets, and levers by which the reciprocating motion is given the cutters. Fig. 5 is a detached perspective view of a toothed wheel of the machine. Similar letters refer to like parts.—The object of the machine is for cutting out blocks of stone in quarries, and so far as we know, is the first machine successfully applied to this purpose.

A represents a frame constructed in any proper manner to support the working parts of the machine. B is a cutter stock which works between ways or guides, *a*, at one side of the frame, A, and at its lower part. On the outer side of the cutter stock there are two vertical racks, C C, which are fitted in grooves in the side of the stock, and have cutters, D D, attached to their lower ends, one cutter to each rack, as shown in fig. 1. The cutters, D D, are attached to the racks, C, by pivots, so that their lower ends or cutting edges may be raised in one direction, viz: outward from the racks. E E, are pinions which gear into the racks, C. The axes of these pinions pass through the cutter stock, B, and have ratchets, E', on their inner ends. F F are two pawls, the inner ends of which are attached by pivots to a rod, F', which works freely in loops or staples on the inner side of the cutter stock, B. G is a lever, the inner end of which is secured to the rod, F', the lever being attached by a pivot to a support or lateral projection, G', attached to the inner side of the cutter stock; H' is a bar attached to the lower end of the frame, A. The outer end of the lever, G, rests upon this bar, which is provided with vertical stops, H H''. On the inner side of the cutter stock, B, there is a rack, I, in which a pinion, J, gears, said pinion being attached to one end of a shaft, L; on the opposite end of the shaft, L, there are two pinions, O K, one of which, O, gears into a toothed wheel, P, during a portion of its revolution, and the other pinion, K, gears into a pinion, N, on a shaft, M, which is parallel with the shaft, L. The pinion, N, also gears into the toothed wheel, P, during a portion of its revolution, the two pinions, N O, alternately gearing into the toothed wheel, P. R is the shaft of the wheel, P, and S S' are two shafts, one at each side of the shaft, R, and parallel with it. The two shafts, S S', are provided with pinions, T T', which gear into the toothed wheel, P.

MACHINE FOR QUARRYING SLATE.

Fig. 1



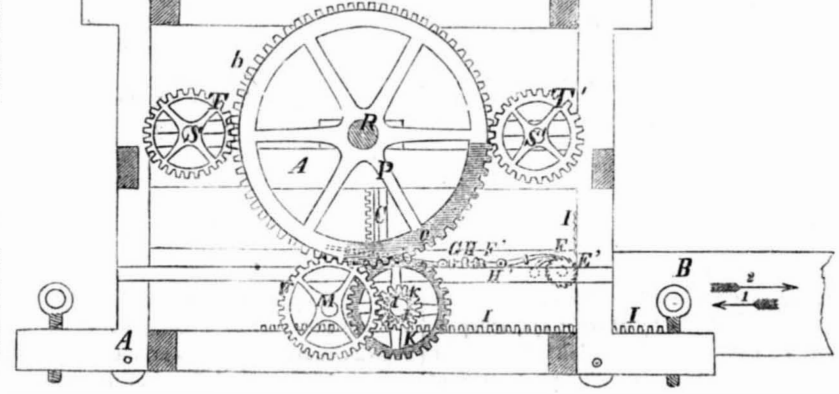
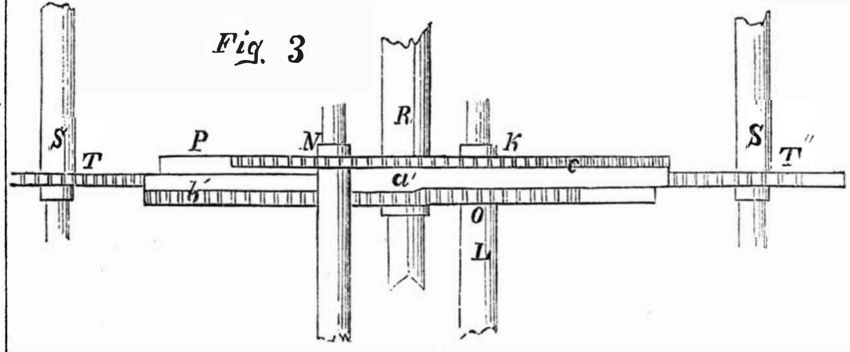


Fig. 2

The toothed wheel, P, has its teeth peculiarly arranged. One portion of the teeth (the center) shown in white, fig. 3, designated by *a'*, extends around the whole periphery of the wheel, and the pinions, T T', gear into this portion. The ends of the teeth, each side of the center portion, *a*, do not extend wholly around the wheel, but only a portion of it, as shown in figs. 2 and 3, and fig. 5, the portion designated by *b'* extending around a greater surface of the wheel than the portion designated by *c*. The pinion, N, underneath the wheel, P, when said pinion is in gear with the wheel, P, meshes into the portion, *c*, of the teeth of the wheel, P, and the pinion, O, meshes into the portion, *b'*, of the teeth of the wheel, shown in fig. 3.

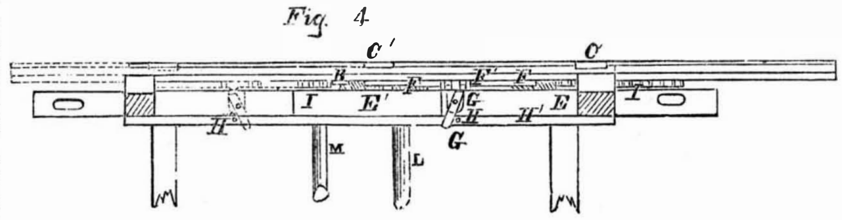
Operation—The frame, A, is properly placed in the quarry, so that the cutter stock, B, will be over the spot where the cutters are

Fig. 3



intended to operate. Motion is then given the shafts, S S', one or both of them, and the toothed wheel, P, is rotated, and motion communicated alternately to the two pinions, O N, the pinion O being made to rotate when the portion, *b'*, of the teeth of the wheel, P, gear into it, and giving a motion to the cutter stock in the direction indicated by arrow 1, see figs. 1 and 2. And when the portion, *b'*, of the teeth of the wheel, P, have passed off of the pinion, O, it ceases to rotate, and the portion, *c*, of the teeth of the wheel, P, gear instantly into the pinion, N, which works into the smaller pinion, K, on the same shaft, L, as the pinion, O, and consequently an accelerated return movement is given the cutter-

Fig. 4



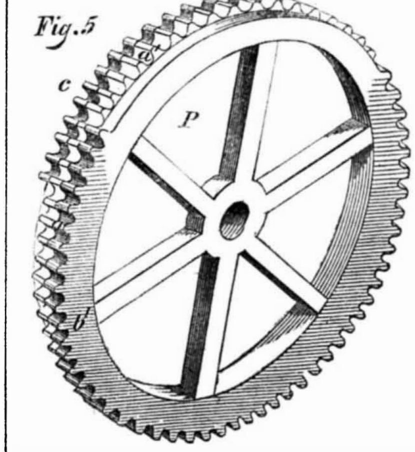
stock, B, in the direction of arrow 2. The cutter stock thus has a reciprocating motion given it, and during the movement of the stock in the direction of arrow 1, the cutters, D D, act upon the stone and cut it, the points or edges of the cutters during the return movement of the stock yielding or moving outwards from the racks, C C, in consequence of their attachment to the racks by the pivots, *b*. The racks, C C, are moved downwards at each forward movement of the stock, B, by means of the lever, G, striking against the stop or pin, H, on the bar, H', said lever in consequence moving the pawls, F F, and turning the ratchets, E' E', which cause the pinions, E E, to operate accordingly upon the racks, C C, and move them downward the distance of the table. At the end of the forward movement of the stock, B, the lever, G, strikes against the stop or pin, H'', and the pawls, F F, are moved back to their original position, so as to act upon the ratchet as before stated at the forward movement of the stock.

The above machine works well in practice, it has been tested in cutting slate, and a vast deal of labor is saved by its use, and the waste attending the cutting out of slate by the usual hand labor is saved, one, two, or more cutters may be employed, according to the hardness of the stone to be cut.

It will be understood that the cutters are made to cut sufficiently deep grooves into the slate or stone as to allow the blocks which are surrounded by the grooves to be broken off.

The machine is about six feet long and two feet in breadth. It is made entirely of cast iron; its weight is about 750 lbs. In the ordinary manner of quarrying slate, two men can cut a groove 6 inches wide, 5 deep, and 24 feet long, in ten hours with the pick.—With this machine two men can cut a groove ¾ inches wide, 8 inches deep, and 160 feet

Fig. 5



long, in the same time, allowing 36 minutes of working to the hour, and the rest of the time for adjusting and moving the machine. This is the result on the hardest slate of Northampton Co. with one cutter. In softer slate two or three cutters may be used. The machine may be so made by placing the gearing more on one side, as to obtain room on it for a small steam boiler, to work it by steam power. Blocks can be cut off any size for roofing slate, thereby effecting a great saving of material. It is adapted for quarrying stone as well as slate.

More information may be obtained by letter addressed to the patentee at Nazareth.

New Life Boat.

John B. Smith, of No. 29 Whitehall street, this city, has shown us a model of a new life boat, which embraces a new method of taking persons off a wrecked ship and lowering them into the life boat, and to have all under cover. The boat is made of two sections with a space between the two, in which there is a central paddle wheel, to be operated by crank handles, which really appears to be better than oars, as it will be a fixture. The two sections are braced together by angle irons. The hatch to the hold of the life boat is a circular curb, and to this is fitted a long tube of india rubber to reach the deck of the ship. Into this tube the passengers are lowered by a tackle, and they slide down dry into the boat. The upper part of the boat is rounded with a buffer of cork. Mr. Smith was led to design his boat from observing the miserable surf boats used on Staten Island during the wreck of a packet ship last winter. His ideas are good.

Corn Planter.

The corn planter of Andrew J. Barnhart, of Schoolcraft, Mich., whose patent claim is on another page, is a hand implement. It makes the hole, drops the seed, and covers it by a simple operation. A small hollow cylinder or piston works within another containing the seed; by one stroke downwards, this hollow piston makes a hole, by taking up the earth, and, then the seed drops down; the return stroke deposits the earth formerly lifted upon the top of the seed, and covers it.

Scientific American.

NEW YORK, MARCH 10, 1855.

Poisoning with Ham.

On the 22nd of Jan. last, a German family in this city named Wise, and some others with them, partook of some ham and bread, and drank three quarts of lager beer. Six days afterwards all who had partaken of the ham became sick, and two of them, Mr. and Mrs. Wise, were taken to the New York Hospital, where both died, after a lingering illness. It was at first thought that the beer had something to do with their deaths, but the Coroner's Jury on the female, on the 23d inst., and her husband on the 26th, after hearing testimony, decided that "they were unable to refer the deaths to any other cause than some poisonous property in the ham they had eaten." D. C. Finnel, who gave testimony in the case, stated that "smoked hams occasionally produced symptoms like those in the case of Mrs. Wise, and this was due to the presence of a fatty acid generated during their preparation. About the year 1800, over 200 persons were poisoned from eating hams and sausages in Wurtemburg, Germany, and of these 100 died. The symptoms of poisoning appeared about ten days after the meats were eaten. On analysis, a fatty acid was detected, which was supposed to be the cause of the poisoning. It is not necessary for a ham to be in a state of decomposition to produce poisonous effects. On examination after death in the cases spoken of, the throat was dry, the mucous membrane white, and slightly thickened, and the stomach and intestines presented signs of inflammatory action. All persons are not susceptible to the action of poison to the same extent. From the history of this case, and the state of the body of the deceased after death, I am led to believe that death was caused by the poisonous effects of the meat in question." This is thesubstance of his testimony as published. The ham was eaten without being cooked.

We wish the Jury had been more particular in eliciting scientific testimony respecting this poisonous acid said to be found sometimes in hams. That German sausages, those made partly of the blood of animals, sometimes become poisonous as stated, is a fact well known, and its nature and effects were described, according to Liebig's theory, on page 112, Vol. 6, SCIENTIFIC AMERICAN, but we never till now heard of a like poison being found in prepared hams, and we are afraid that the testimony in these cases, to this effect, is neither positive nor plain. What kind of acid is it which is so poisonous; what is its composition? are questions which should have been asked by the Jury.

Liebig, in his Letters on Chemistry, presents some very useful information on sausage poisons, and the last No. (Feb.) of the *Medical Examiner*, published by Lindsay & Blakiston, Philadelphia, contains an excellent article on this very subject, translated from *Schmidt's Jahrbuch*, a German periodical. The first notice of poi-oning by sausages dates from the year 1735. The most of the cases occurred in Swabia. In Wurtemburg, 400 cases of sickness, of which 150 died, occurred during the last 50 years, from eating sausages. Isolated cases have occurred in other parts of Germany. They occurred mostly in April. Prof. Julius Schlossberger, who has written an able essay on the subject, has asserted "that blood and liver sausages are the only kinds in which the poison ever forms." Where then has Dr. Finnel acquired his information respecting a fatty poisonous acid ever being found in hams. The poison forms in these sausages only when long kept, and in warm weather, not such cold weather as we have in New York during winter. His testimony requires explanation, and we hope for the sake of science and medical jurisprudence, that it will be given. Chemists are not agreed as to a fatty acid being the cause of poisoning; Liebig adheres to the fermenting theory, Kerner to a fatty acid, and Schlossberger to an organic base similar to *nicotine*. More light is wanted on the subject.

Phosphorus.

This is one of the simple substances; its chemical symbol is P. It was discovered by Prof. Brandt, of Hamburg, in 1660, but Kunkel first made public a process for preparing it. Since that time it has become a most valuable material by its application to one of the useful arts. It is a remarkable element, and appears to be essential to the organization of the higher animals, it being found in their fluids, and forming the basis of their bones, in the state of "phosphate of lime." A cotemporary says respecting it, "every other substance with which we are acquainted can be traced either to the earth or the air, but phosphorus seems to be of animal origin." It is indeed true that it is obtained in the greatest quantities in animal substances, but if it were obtained from them exclusively, the conclusion would be that it was not one of the chemical elements, but a peculiar compound substance, formed in the animal system. It, however, exists in the state of phosphoric acid in various rocks, in fertile soils, and in most vegetable substances. It is obtained for use from bone, earth, or native phosphate of lime by decomposing them with two-thirds their weight of sulphuric acid, separating the insoluble sulphate of lime by filtering, evaporating the phosphoric acid by heat to a paste, mixing it with charcoal, and distilling in a retort. The beak of the retort is bent down a few inches into a bottle containing water, and the heat of the furnace gradually raised. The process of distillation is generally completed in about 30 hours.

At the common temperature of the atmosphere, phosphorus is a translucent soft solid of a light amber color, which may be cut with a knife. It melts at 108°, undergoing a remarkable dilatation, and becomes transparent and colorless immediately before fusion. When fused and left undisturbed, it sometimes remains liquid for hours, at the atmospheric temperature, particularly when covered with an alkaline liquid, but becomes solid when touched. Light causes it to assume a red tint, hence it is generally kept in opaque bottles. It possesses such peculiar properties that it has always been a subject of great interest to chemists, and the article in last week's SCIENTIFIC AMERICAN, taken from the proceedings of the New Orleans Academy of Sciences, shows us that we are not yet at the end of knowledge respecting it.

It has been said that man contains more phosphorus in proportion to his weight than any known animal; and as it has been found in his brain, it has been suggested that it has something to do with his thoughts—his superior intellectual powers—but this is mere supposition. A few years ago it used to be an expensive article, but it has now become comparatively cheap. With what success it may be applied in medicine, as proposed by Dr. Crawcour, of New Orleans, the future alone will decide. At present its most useful application is in the manufacture of friction matches, without which we would now consider ourselves unfortunate mortals. The phosphorus for these is made into a paste by first dissolving it in some water at 120°, then adding some binoxyd of manganese or litharge, a little of the nitrate of potassa, a very small quantity of the chlorate of potassa, some Prussian blue to color it, and some gum to thicken. The ends of the matches are first dipped into melted sulphur, then cooled, and afterwards dipped into the phosphorus paste, after which they are carefully dried in a warm room. The gum, when dry, defends the phosphorus from oxydation. By substituting niter for the chlorate of potassa, the matches will not have that snapping or detonating action which is often noticed. Great caution should be used in handling it, as a burn from it is very severe. The superphosphate of lime, a famous fertilizer, is made by dissolving bones in sulphuric acid in stoneware crocks, in which state they become soluble in water, and capable of being taken up as food by plants. In manufacturing this substance, the free acid is removed.

Benzole Light.

Our readers will remember that we published an illustrated description of Mr. Mace's Benzole Gas Machine on page 153, and as we have been written to on the subject respecting the patent, we would state for the information of all concerned, that he does not claim any patent on the machine, but he manufactures and sells them to all who wish to purchase, and he has a right in the patent for the combined fluids used in the machine (and at such prices he says as defies competition,) for the four western counties of Massachusetts. The American Gas Co., No. 335 Broadway, this city, own the patent right for the fluids, for New York and Pennsylvania, and the President of the said Company has the control of the patent for the Southern and Western States.

We have before us the copy of a report on the nature, economy, and illuminating power of the fluids, by Doctor Augustus A. Hayes, of Boston, Assayer of the State of Massachusetts—a most able chemist. The improvement of this compound fluid—benzole and alcohol—consists in passing humid air through it. A machine like the one illustrated on the page referred to, was placed entirely under his control. An approximate measurement of the illuminating power of one fish-tail burner, compared with the flame of an adamantine candle, six to the pound, was as four for the gas burner to one of the candle. The flame of the latter appeared dull when contrasted with it. The dryer the air used in the mixed fluid, the less clear was the light, and the gas is also more easily condensed than when moister air is used. By one experiment made by Dr. Hayes, the pipe of the machine was encased in ice, and the most distant point selected for one fish-tail burner. When the apparatus became cold, the air gas was lighted, but it was found that it would not afford perfect combustion. On substituting an *argand* for the *fish-tail* burner, however, the same cold air gas burned with a brilliant white flame eight inches high. The gas was cooled in passing the ice to 32°; thus showing that the gas in the apparatus will burn in an apartment of a pretty low temperature. Two *argand* and two *fish-tail* burners with high flames, consumed about three ounces of the mixture in 45 minutes, and cost 1 cent 1 mill per hour for four of these burners. Dr. Hayes regards this invention as an addition of great importance to our sources of light, and that it is safe and simple to use.

Bichromate of Potash—Ignorance of Senators.

On the 1st inst., during a discussion in the Senate of the United States, Mr. Seward said that he had a letter from a manufacturer of the bichromate of potash, stating that a change in the tariff would injure him; Mr. Badger asked, "what is the bichromate of potash?" Mr. Seward gave no answer, when Mr. Hunter said, "I don't know—and the presumption is, that Senators are ignorant."

It seems there was not a solitary Senator who could answer Mr. Badger's question, not even the Senator from Maryland, in which State it is extensively manufactured. It was proposed in the Bill under discussion, to reduce the tariff on dye stuffs, consequently it included the bichromate of potash, which is one of the most common and extensively-used coloring minerals employed in dyeing.

The bichromate of potash is formed by the union of chromic acid and potash. Chromic acid is an oxyd of the metal chromium, which is found in considerable quantities combined with iron, in Maryland and Pennsylvania. It is employed for coloring yellow, and orange—and catechu browns—on cotton. It is used for making black ink, by combining it with logwood. It is used for coloring glass, and in the state of chromate lead, it is a beautiful yellow pigment, extensively used in painting. Within the past few years it has come into very extended use, as a mordant for coloring wool, and has entirely superseded some of the old tedious processes. Every Senator in the Senate is indebted to the bichromate of potash for the color of his coat, and yet not one of them knew what it was. It is a positive fact that very few of our public men can be called *learned*, if science be taken as the standard of learning, and we do not know a better one. What signifies the learning of a man who can name the bichromate of potash in five or six different languages, if he is ignorant of its nature and uses, in comparison with that of the man who can make and apply it to a number of useful purposes? It is greatly to be regretted that so few mechanics, manufacturers, and agriculturists are elected Senators when so many questions connected with their interests have to be legislated upon, by men not qualified (by their want of information) to do so intelligently.

Detonating Railroad Signals.

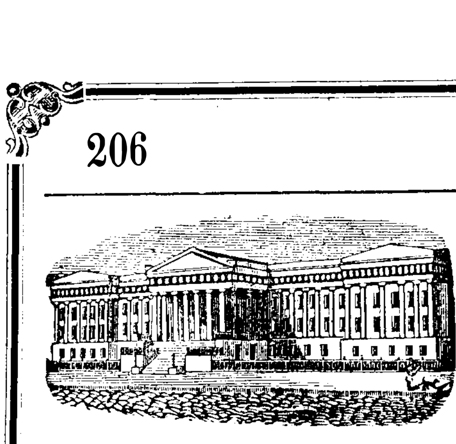
On page 150 we quoted an extract from the Portland, (Me.,) *Argus*, which gave a description of some experiments by J. F. Wilkinson, of Syracuse, N. Y., and added, "we rather think he obtained *some* of his ideas from the columns of the SCIENTIFIC AMERICAN." This language contains no charge, and not an uncourteous word. On the 27th Jan., the *Railroad Advocate*, alluding to this said, "we do not think, under any circumstances, Mr. Wilkinson can be justly accused of having *pirated* any essential ideas of the explosive alarm signals from the SCIENTIFIC AMERICAN." It also said, "we had been accustomed to hear of detonating or fog signals as being in general use in England." On page 173 we noticed these extracts, and merely said "he (Mr. Wilkinson) had never been accused of pirating any ideas from our columns," also "we never heard of their being in general use in England." Our language was courteous, and free from anything that any person, possessing the feelings of a gentleman, could find fault with, although the language respecting *piracy* used in reference to us, was far from being unexceptionable. We had not the remotest idea that any person would have found occasion to attack us for what we said, and we thought it would be the end of the matter; but we misjudged. The *Railroad Advocate* of the 24th ult., on page 6, with the spleen of a schoolboy, says in reference to our never having heard of the explosive signals being in general use in England, "if the SCIENTIFIC AMERICAN made its acknowledgement merely as an apology for a previous statement, we are satisfied."

Apology, forsooth. It is related of old Dr. Emmons, that a young minister who preached in his pulpit one day, and who dealt considerably in ground and lofty literary tumbling, having afterwards asked the venerable divine his opinion of the sermon, was answered by the old man arising, puffing out his cheeks, staring wildly around, throwing up his arms tragically, and then sitting down.

That detonating ball signals had been experimented with on *one* railroad in England, was something we were well acquainted with; but they were merely balls laid upon the track by the guardsman, a very different plan from Mr. Wilkinson's. These ball signals were described in a work published in this city five years ago. We advise our egotistic cotemporary to stick to its text when it attacks us; all intelligent persons form an opinion of what is in a man by this criterion.

Scientific Nonsense.

Prof. Loomis delivered a lecture on the 2nd inst., in the University, on the Plurality of Worlds. Assuming the nebular theory of Laplace to be true, he supposed that the outermost planet of our system was first fitted for the reception of man; but at present he supposed it to be 80° below zero, and that humanity had long since ceased to exist there. The temperature of *Mars* he supposed to be 10° below zero, and in *Venus* he supposed that the polar regions were the only place fit for the abode of living beings. Upon his principle of reasoning, this planet will yet become so cold that no creature will be able to live upon it. Allowing the nebular hypothesis to be correct, so far as it regards the materials of our system being once in a state of gas, how could the planets ever have become globes of molten matter? We cannot conceive how they could by any of the laws now in existence.



[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from he United States Patent Office.

FOR THE WEEK ENDING FEBRUARY 28, 1855.

PIANOFORTE FRAMES—H. S. Ackerly, of New York City: I do not claim the arrangement of the strings in two tiers crossing each other, nor the construction of the wrest plank with one part elevated above the other.

But I claim, first, the arrangement of the wrest plank of a square pianoforte along the front and across one of the front corners of the instrument, as described, to receive two tiers of strings, of which the tier comprising the longest strings is arranged nearly parallel with the front and back of the instrument, and the shorter ones diagonally across the same, said arrangement being for the purpose fully set forth.

Second, the construction of the metallic plate, B B, with the straight brace, e, across the back, and the arched molding or brace, f, running from the said straight brace to the front of the instrument, as and for the purpose set forth.

Third, constructing the plate, B B, with a recess to receive the wrest plank so that it may be firmly secured against the tension of the strings, substantially as set forth.

[See notice of this improvement in Pianofortes on another page.]

HOTEL ANNUNCIATORS—John Bale, of Buffalo, N. Y.: I claim, first, the arranging the number plate, C, upon the sliders, A, or their equivalents, in combination with the screen plate, D, so that the number plate shall be pushed forward, lifting the screen plate, and thus exposing the number to view.

Second, I claim the combination of the frame, L, its hangings, and the stop, M, with the stop, P, arm, O, and lighters, G, or their equivalents, by which the wires are made to act independently of each other in striking the gong, unless the hammer shall, at the instant be in active operation.

GAS COOKING STOVES—James B. Blake, of Worcester, Mass.: I claim the described method of heating the oven of a gas cooking stove, the oven being surrounded by a flue or chamber having an opening in one end for the admission of air for the combustion of the gas which is burned immediately beneath the oven and openings in the bottom for the escape of the products of combustion, the latter being retained in contact with the oven until sufficiently cooled to descend and pass off in the manner set forth.

ANCHOR TRIPPER—S. R. Bryant, of New York City: I claim the supporter, B, the pawl, C, and the hold-fast, D, as arranged in relation to the guard, a, for the purpose set forth.

RAISING SUNKEN VESSELS—H. N. Corbett, of Buffalo, N. Y.: I do not claim the mode of raising sunken vessels by the use of casks filled with water, which is to be pumped out after the casks are attached to the vessels.

Nor do I claim the mode of so doing, by means of expensive buoys, which obtain their buoyant power by inflation, after they are sunk and attached to the vessel

But I claim the mode of raising sunken vessels by means of casks or buoys previously filled with air and sunk by a weight which is readily detached and raised to the surface after the buoy is secured to the vessel, substantially as set forth.

ADJUSTING CYLINDERS IN BORING MACHINES—Wm. B. Emery, of Albany, N. Y.: I claim, first, the dividing dial and its catch in combination with the ratchet and pawl or their equivalents, substantially and for the purpose as described.

Second, I claim the compound dial plate and catches, substantially and for the purpose as described.

ADJUSTING STUFF IN PLANING MACHINES—Wm. B. Emery, of Albany, N. Y.: I claim, first, the bed plate, A, of iron or other suitable material provided with teeth projecting from it, and adjusted at suitable angles together with the wedges or their equivalents, constructed substantially as described.

Secondly, I claim the bed plate and wedges, substantially as described, in combination with any suitable planing machine.

MAKING CHAIN LINKS—A. M. George, of Nashua, N. H. I claim the arrangement of the forked lever, H, confined to the arm, G, in relation to the inclined plane, Q, and former, I, and operated for relieving the former of the link, as set forth.

REPEATING SINGLE BARREL FIRE ARMS—D. B. Neal, of Mount Gilead, Ohio: I claim, first, the combination of the elongated hammer with the false hammer arranged as described.

Second, the arrangement of the lever, E, and rod forward for throwing the false hammer, F, substantially as set forth.

And I hereby disclaim the original invention of the double shooting one-barrel fire arms, and of all and singular the parts and the combination and arrangement of the parts thereof, except the arrangement and combination of the parts merely which I before claim.

[In No. 6, Vol. 10, SCI. AM., may be found a description of this invention.]

FIRE ENGINE—Amos Nudd, of Exeter, N. H.: I do not claim the application of a fly wheel to a fire engine or to any other machinery, but I claim the method described of easing the motion of the brake lever by the attachment of a crank, in the manner set forth.

ROLLS AND DRIERS FOR PAPER MAKING—Obadiah Marland, of Boston, Mass.: I have spoken of copper as the material used for covering the rolls and driers; but I do not confine myself to the use of this metal, as zinc and perhaps other metals may be employed, and I do not claim the use of any particular metal for the purpose; neither do I claim the covering of one metal with another by means of galvanic or electric deposition.

But I claim the method described of making paper machine rolls and driers; a metallic foundation of the requisite strength and thickness being made use of for the body of the roll, upon which a surface of copper or other suitable metal is deposited by galvanic or electric action, for the purpose set forth.

MACHINE FOR MAKING BUTT HINGES—Charles Miller, of New York City: I claim, first, the arrangement, as described, in the same line, of the punches, d and d', which cut out two blanks to the proper shape for a hinge, and the bending rollers, m m', which give the preparatory bend to the two blanks, to form the joint, whereby two strips or bars of metal fed at proper intervals of time towards each other under the said punches and through the said rollers, are cut into blanks, bent and put together ready to receive the pin, as set forth.

Second, connecting together the two cutters, h h, which cut off the two blanks, and arranging and operating the said cutters so that they will cut off the blanks both at the same time, but not until they have both received the preparatory bend to form the joint, and been put together ready to receive the pin, substantially as set forth.

Third, so controlling the operations of the punches, d and d', which cut out the metal blanks, the rollers, m m', which give the preparatory bend to form the joints and the cutters, h h', which cut off the partly formed hinge from the strips that all act during each intermission of the feed movement, but that the cutters act more quickly or earlier than the punches, in order that the preparatory bending operation which takes place after the action of the cutters may be effected before the punches are entirely withdrawn from the metal and that the punches may serve to hold the strips during the said bending operation, substantially as set forth.

Fourth, the arrangement in any way substantially as described, of a slider, V, and an intermittently rotating wheel, W, for the purpose of removing the partly formed hinges from where they are put together and cut off, and carrying them and holding them to receive the pin and have their joints finished, to wit, the said slider, V, working transversely to the direction in which the strips of metal move to be submitted to the successive operations of punching, bending, and cutting off, and the intermittently rotating wheel W, being placed on the opposite side of the strips to the said slider.

Fifth, the arrangement of the wire feeding and cutting apparatus, and the press which carries the closing die, 38, in such a manner that the horizontal intermittently rotating wheel, W, which receives the partly finished hinges when they are cut off, may bring and hold the hinges severally and successively first opposite the said feeding and cutting apparatus to receive the wire to form the pin, and afterwards opposite the said closing die to have the joint closed. This I claim, irrespective of the particular means of feeding and cutting off the air, as almost any kind of feeding and cutting apparatus may be used, and of the particular method of operating the closing die, which may be operated by any of the means commonly employed for such purposes.

Sixth, the eccentric curved piece, arranged substantially as shown and described, for the purpose of finishing the insertion of the pin in the hinge by pushing into the joint so much of the pin as is left protruding when the pin is cut off, said pushing being effected by the carrying wheel, W, carrying the protruding end of the pin in contact with the said curved piece.

Seventh, the general arrangement and combination of the several mechanical devices and appliances, substantially as shown, to form a machine for the manufacture of hinges from bars or strips of metal, complete at one operation.

[A description of this invention may be found on another page.]

SHECORING LEATHER STRAPS—Chas. Morris, of New Haven, C.: I claim the combination of the knife, a, and gauge, B, with the swinging frame, F, when this frame is supported by the frame, C C, or its equivalent, to allow this frame, F, to yield to the varying thickness of the strap, and the whole is constructed, combined, and made to operate as described.

CONSTRUCTION OF VESSELS—Zadoc Pangborn, of Algonac, Mich.: I claim the arrangement of tanks constructed as set forth, the same consisting in the extension and bifurcation of the ribs of vessels' hulls, so as to form an arched series of tanks or receptacles for tanks, in the manner and for the purposes set forth.

PROPELLERS—Franklin Peale, of Philadelphia, Pa.: I claim the arrangement of the paddles, A, the arms, k, and shafts, B and C, arranged and operating in the manner and for the purpose substantially as described.

SEED PLANTERS—Robert Romaine, of Montreal, C. E.: Patented in England May 10, 1853: I am aware that a seeding apparatus has been arranged to follow a toothed cylinder, and also to precede either a toothed cylinder or roller, therefore I do not claim either.

But I claim the rotary toothed cylinder, or digger, followed immediately by the seed sower and roller, as described.

HOT AIR FURNACES—G. S. G. Spence, of Boston, Mass.: I claim carrying the smoke discharge flue of the fire chamber, back through the fire chamber, substantially as specified, whereby the draft of a long flue is promoted.

I also claim carrying the smoke discharge flue of the fire chamber or radiator, back through the fire chamber, in combination with not only providing it with one or more orifices for the discharge of the combustible properties or gases of the smoke into the fire place, but with diminished opening or passage sufficient only to carry off the non-combustible volatile portions of the smoke.

I also claim combining with the discharge pipe, O, and the orifice, R, the pipe to extend back into the discharge pipe, O, and with respect to the opening, T T', as specified, the same being to facilitate the passage of the combustible gases into the fire place.

TENONING MACHINE—Wm. Steele, of Wheeling, Va.: I claim the arrangement of the feeding box, H, the rest, s, and their base, p, with each other and with the gate, C, which carries the tenoning cutters in such a manner that the said feeding box may be moved from the said rest, upon the base, p, the desired length of a tenon, and then be fed forward again to bring the joist to be operated upon in contact with the cutters, substantially as set forth.

I also claim combining the base, p, of the feeding box, H, and of the rest, s, with the frame, A, in such a manner that the said base, box, and rest can be secured in an oblique position to the sides of said frame and to the direction of the movements of the tenoning cutters whenever it may be desired to form tenons with oblique shoulders, in the manner set forth, or its equivalent.

I also claim the combination of the incision cutters, l l, with the angular edged cutters, j j, in such a manner that the said incision cutters will penetrate into the surface of the wood in advance of the tenoning cutters a sufficient distance to prevent the said edges of the tenoning cutters from tearing outsplinters from the sides of the timber operated upon.

BED BOAT OR LIFE PRESERVER—Joseph Stevenson, of Philadelphia, Pa.: I do not claim the material of which the boats constructed; nor do I claim a flexible or folding boat, as these are not new.

But I claim so hinging the bulkheads or bows to a flexible boat, that they may be turned down out of the way for stowage in the bunks or berths of a vessel, and may be as readily drawn up and laced so as to form a bow, substantially as described.

I also claim, in combination with the hinged bulkheads or bows, the apron which is drawn up over the joint of the two bulkheads, for the purpose of preventing any water from entering the boat through said joints, in the manner described.

STEREOSCOPE CASE—John Stull, of Philadelphia, Pa.: Having thus described the construction and operation of my invention, I proceed to state that I do not claim constructing a stereoscope case, with a single adjustable flap or supplementary lid within the case, as such invention has been made and used before in daguerreotype cases.

But I claim constructing a stereoscope case with the three jointed pieces, E E E, or their equivalents, so applied as to preserve at all times a perfect parallelism between that part of the case containing the lenses, and the part which contains the figures, so that a perfect stereoscope is formed of the whole, as described, and the two figures, B B, by binocular vision are apparently formed into a solid figure, the whole being at the same time adapted to fold or close into a small flat case (resembling the common daguerreotype case) that may be conveniently carried about the person, if so required, substantially as described.

CUTTING BARREL HEADS—Wm. L. Young, of Muscatine, Iowa: I claim the centrally pressing toothed springs, as arranged, and also their combination with a disk free to vibrate on its axle, for the purposes set forth.

FORKS FOR GOLD DIGGERS—Lewis Teese & Son, of San Francisco, Cal. Ante-dated Nov. 22, 1854: We claim making the fork tines triangular, with one side of the triangle forming the back of the tines, for the purposes and in the manner set forth, whether applied to more or less number of tines or length or breadth of fork.

CORN SHELLERS—J. P. Smith, of Hummelstown, Pa.: I am aware that an adjustable flat toothed bar has been used opposite to a toothed cylinder in corn shellers; I am also aware that the ribbed shelling bar has been use; therefore I do not claim any of the above mentioned parts.

But I claim, first, the breast beam, j, having fluted concave ribs, l l, cross ribs, n n, with openings or spaces, q q, and slides, o o.

Second, I claim the guide frames, r r, in separate pieces, for the purpose described.

Third, I claim the vibrating feeder having teeth thereon in combination with the pulley, z, having a zig zag groove, e, substantially as described.

MANDREL FOR HOLDING CARRIAGE HUBS, &c.—Niram Hawley, of Rome, N. Y.: I claim the application of the cone shaped cylinders calculated for every size box or hub and the face end of the cylinder, to make the revolutions of the set invariable.

HEMP BRAKES—D. W. Hughes, of New London, Mo.: I claim arranging and applying the breakers, B B, so that they may be brought while the machine is in operation, to the proper distance apart to suit the nature of the material to be operated upon, and may be caused to approach each other or near to the line of operation of their corresponding breaker, C, as the operation progresses, substantially as set forth.

[For a description of this invention see No. 19, present Vol. SCI. AM.]

LOOMS—Wm. V. Gee, (assignor to the Atwater and Bristol Manuf Co.) of New Haven, Ct.: I claim the method of forming button holes in the process of weaving suspender webbing and other fabrics by mounting the loom with two or more sets of harness each governing all the warp threads on one side of the intended button hole, and each set being lifted and suspended, substantially as and for the purpose set forth.

And I also claim connecting each set of harness, under the before-named method of weaving fabrics with button holes, with a bar or slide governed by a cam and catch, or their equivalent thereof, to suspend the operation of either set of harness, substantially as described.

And I also claim, in combination with the mechanism described for lifting and suspending the action of the sets of harness, or any equivalent therefor the mechanism for determining the period of the suspension of the action of the several sets of harness, or any equivalent therefor, substantially as and for the purpose specified.

PUMPING WATER OUT OF VESSELS—Alex. Kirkwood, of Jackson Co., Miss.: I claim the attachment of the described pump or of any ordinary force pump to the bottom of a vessel, so as to force water out at her bottom, thereby avoiding the labor and expense of raising the water above the level of the water the vessel floats in.

SPOKE MACHINE—Asa Landphere, of Albion, Pa., and Samuel Remington, of Ilion, N. Y.: We claim the dressing of spokes by means of a series of revolving cutters whose edges present an oblique profile in part of the spoke, when said cutters are so arranged on their shafts as to reduce the spoke in narrow longitudinal sections, by which means much more smooth work is obtained than when the cutters reduce the spoke at one single operation, as set forth.

[A brief description of this invention may be found on page 140, Vol. 9 of the SCI. AMERICAN.]

ARRANGING AND OPERATING SUBMERGED HORIZONTAL PADDLE WHEELS—Peter Lear, of Boston, Mass.: I do not claim pumping air into the wheel house of a horizontal or other paddle wheel.

But I claim the pipe, P, arranged in connection with the wheel chamber in the manner described and for the purpose set forth.

PORTABLE GRAIN MILLS—Chas. Leavitt, of Quincy, Ill.: I claim the combination of the bed plate, a, the legs or supports, b, the breaker, c, and the main pivot, d, cast in one piece, and these parts, in combination with the lever, r, attached to an external revolving concave, constructed and arranged substantially as described and for the purposes specified.

HULLING AND CLEANING CLOVER SEED—M. H. Mansfield, of Ashland, Ohio: I claim the arrangement and combined operation of the screen, e, the endless conveyor, f, and the fan, d, in such a manner as to enable a strong blast to be employed without wasting the seeds, substantially as set forth.

MOWING MACHINES—Fisk Russell, of Boston, Mass.; I do not claim the supporting of the frame of a mowing machine on two or more wheels.

But I claim, when two wheels only are employed for the support of such frame, the specified arrangement of the secondary supporting wheel with respect to the main driving and supporting wheel and the driving shaft, such arrangement consisting in placing the axis of the secondary supporting wheel aside of, and not in line with that of the primary wheel, and disposing the secondary wheel back of or on one side of the driving shaft, so as to operate essentially as described.

SCREW JACKS—T. C. Ball, of Walpole, N. H.: I do not claim the invention of jack screws nor any of the forms thereof heretofore used, and I am aware that a jack screw has been constructed in which the center piece has two opposite threaded screws, one on each end and working in two female screws, one above, and the other below.

But I claim the combination of the tubular screw, B, with the standard, A, and the inner screw, C, the whole being arranged, substantially as and for the purpose set forth.

SEED PLANTERS—A. J. Barnhart, of Schoolcraft, Mich.: I claim the combination of the disks, a a' b, movable cylinder, D, and piston, C, the above parts being enclosed or working within a cylinder or case, A, and arranged substantially as shown and for the purpose set forth.

[A notice of this invention may be found on another page.]

SPADE PLOWS—David Russell, of Drewersburgh, Ind.: I am aware that upon a revolving horizontal cylinder, both movable and fixed, spades have been arranged to dig up the soil, therefore I do no claim such devices.

But I claim the cutter bars, A A', said bars being provided with cutters at their lower ends: and operating in the manner and for the purpose set forth.

COVERING THREAD WITH WOOL OR SILK—John Haslam, of New York City, and James Haslam, of Scarsdale, N. Y. (sole heirs of Joseph Haslam, deceased): We claim, as of the invention of Joseph Haslam, deceased, the method of bedding one thread into a roving or loosely twisted thread of another material, as also the covering of one thread by a roving or loosely twisted thread of a different material, substantially in the manner and for the purposes set forth.

HAND STAMP—D. W. Messer (assignor to D. W. Messer, R. B. Fitts, and Albert James,) of Boston, Mass.: I do not claim uniting the type plate to the handle by means of a ball and socket joint, as that has been done before.

But I claim the india rubber connection between the plate and the handle operating in the manner and for the purpose set forth.

CARDING MACHINES—Horatio N. Gambrill, and Singleton F. Burgee, of Woodbury Mills, Md., patented in England, Aug. 22, 1854: We claim the application of two or more sets or pairs of feeding rollers to the working cylinder of carding engines, substantially in the manner and for the purpose set forth.

We also claim the reversing of the relative velocities of the peripheries of the main working cylinder and stripper, M, at intervals, by an automatic movement, for the purpose of cleaning, or preventing the clogging or packing of the main cylinder, substantially as described.

FIRE ARMS—John Hollingsworth, and Ralph S. Mershon, of Zanesville, Ohio, patented in England Aug. 1, 1854: We do not claim a reservoir of power, simply for rotating the breach, as that has heretofore been done, but we claim, first, the application of a reservoir of power to the rotating of the cylinder or breach, in combination of the cocking and releasing of the hammer in concert, so as to produce two or more discharges from a repeating fire arm, without replenishing said reservoir of power, substantially as described.

We also claim combining a reservoir of power with a rotating toothed "scape wheel," anchor, and trigger, in such a manner that at each periodical releasement of said escape wheel, by the operation of the trigger and anchor, or anchor escapement, the reservoir of power will rotate the chambered breach to the required distance, and simultaneously trip an independent hammer, substantially as described.

We also claim so combining a rotating chambered breach with a reservoir of power, and cock or hammer, as that by the periodical releasement of said reservoir, by means of the scape wheel, trigger, and anchor escapement, said chambers shall be caused to rotate to their required distance, and meet the blow of the hammer at the exact instant that each chamber in succession comes opposite the barrel, substantially as described.

We also claim combining a reservoir of power with an independent cock or hammer, so that by the periodical releasement of said reservoir of power, said hammer shall be tripped at the exact moment that each chamber of the series comes opposite the barrel, substantially as described.

We also claim so combining the stock with the frame, as that by turning said stock a spring or springs shall be wound up, which shall be capable of actuating the fire arm for a series of discharges, substantially as described.

We also claim the peculiar form of guard or protection to the hand on which the fire arm may be supported, so as to guard the hand from any accidental discharge of the chambers when not opposite the barrel, whilst said accidental discharge may escape from the fire arm without detriment to the user, substantially as set forth.

We also claim the conical plate and ring as a means by which the stock and spring box are united to the frame, so as to make a firm connection, and at the same time allow the one to be turned upon the other for the purpose of coiling up or compressing the spring, substantially as described.

REPEATING FIRE ARMS—Ralph S. Mershon, and John Hollingsworth, of Zanesville, Ohio, patented in England, Aug. 1, 1854: We claim, first, a reservoir of power capable of discharging two or more barrels or chambers of a repeating fire arm, substantially as described.

We also claim exploding the cap or similar percussion priming for discharging the chambers, by means of the blow caused by the rotation of the chambers or barrels, bringing each nipple or cap in succession against a vibrating arm or its equivalent, thus causing said rotation to perform the ordinary function of a cock or hammer, substantially as described.

We also claim so hinging the barrel or frame which supports it to the stock, as that when said barrel is swung back or forward, either for removing or recharging the chambers, it will contract the spring to supply a reservoir of power capable of discharging two or more chambers or barrels successively without recocking or recharging at each discharge, substantially as described.

RE-ISSUE.

CANDLESTICKS—John W. Rockwell, (assignee of Francis A. Rockwell,) of Ridgefield, Conn., dated originally Dec. 16, 1851: I not claim the employment of a detached cork or other elastic substance over which a sliding socket is allowed to move, nor do I claim the employment of a sliding socket.

But I claim as the invention of the aforesaid Francis A. Rockwell, the employment of elastic packing attached to the standard, bar, spring, or slide of a candlestick substantially in the manner described, whereby I am enabled to support said part, preventing the leaking of the grease, and use a shorter sliding socket than when the cork is inserted loose in the socket.

DESIGNS.

DAGUERREOTYPE CASES—Henry A. Eickmeyer, of Philadelphia, Pa.

STOVES—John Haufbauer and Henry Waas, of Cincinnati, Ohio.

A Mine of Bismuth.

A correspondent—J. J. Herschbuhl, Watchmaker and Jeweller, Louisville, Ky.—informs us that J. G. Balee, of Simpsonville, Shelby Co., that State, has discovered a deposit of bismuth, largely mixed with the soil, on his plantation. The metal was taken from the ground, melted in an iron ladle, and sent in a bar to Louisville, to be analyzed by Charles Mohr, chemist. His statement is, "the metal is very brittle and fusible, and exhibits by the blow pipe the characteristics of bismuth. It readily dissolves in concentrated nitric acid to a clear solution. Muriatic acid acts but feebly upon it. The solution in nitric acid was subjected to the regular course of qualitative analysis, and the result obtained was nearly pure bismuth. There were some traces of zinc and iron, but the quantity was so minute as to be regarded unimportant in the practical applications of this metal. The discovery of bismuth in Kentucky is a new feature, we believe, in the mineral resources of that State.

Plenty of Marl.

In the interior of Norfolk, England, is a bed of oyster shells, nine miles long, and above 18 feet thick. Other shells and bones (some of elephants, &c.,) also abound, 100 feet above the sea level. Alder and hazel bushes are found 20 feet below the surface-level. Remains of extensive forests are traced beyond the mouth of the wash and under the land, with bones of elephants, oxen, and deer. The same forests are found on the opposite coast of Flanders, and it is believed that they once joined.

Who will Arrest a Desert.

The Sydney *Empire* appeals for aid to the science of England to meet an invasion of sand. Sydney is subject to a serious annoyance in the drifting of a quantity of loose sand on its southern boundary. The southerly winds, which have great force there, carry this shifting mass of sand on towards the city, and it has already overlaid some cottages in the suburbs.

It is a well known fact, that there were large cities and fertile plains, where is now only the dreary and barren desert of Egypt. With a plentiful supply of fresh water, the Sydney people can arrest the progress of the sand, but not otherwise.

Mechanics Fair in Washington.

What is the matter with the present Fair of the Metropolitan Mechanics Institute in Washington? It seems to have attracted no notice from the Washington press, excepting a mere passing remark; and we learn by the *Sentinel*, that the Superintendent, T. C. Connelly, has resigned, and C. F. Wood has been elected in his place.

Improvements in Gunnery.

We have received from Capt. J. Norton, of Ireland, some very useful information respecting his experiments with different kinds of bullets and explosive signals. We will endeavor to present the substance of it at an early date.

New Theory of the Tides.

Charles W. Denison, one of the Editors of the *Metropolitan*, Washington, who wrote some articles on a new theory of tides about two years ago, which we briefly reviewed, has, since that time, traveled extensively, and taken many observations, all of which have confirmed him in his opinions; these he intends to present more fully in future numbers of the *Metropolitan*.

No less than 460,494 immigrants arrived in this country in 1854. Of these, 206,054 were Germans. The immigration from Ireland is falling off; that from Germany is increasing. The Irish immigrants amounted to 101,606.

TO CORRESPONDENTS.

F. N. B., of Wis.—If you mean a method of automatic cutting off the steam every stroke, according to the work of the marine engine: we know of no such plan in use.

C. J. B., of Pa.—We are unable to furnish such information as you ask. In regard to the lathe, address Ballard & Co., Oriskany Falls, N. Y.; they can give you the information.

W. R. H., of Geo.—We do not know the price of Griswold's work, but should think it about $1. Mr. Norris, Engineer, of Philadelphia, published a work some time since, upon Locomotives, and we presume upon application to him you can procure a copy.

R. C., of Mass.—You had better address your inquiry in regard to the engine to James T. Ames, Chicopee, Mass.

H. H., of Ind.—Your ideas in regard to unloading passengers and baggage, may be novel, but we question very much if R. R. Companies would adopt them. Are they practical? This question you will do well to consider in all its bearings.

S. P. A., of Ct.—Allow the steam to have obtained a good pressure, and admit it on to the vat in small quantities until the vat has attained to a good heat, then admit a good head of it; find out the weight of a cubic foot of iron, then measure your shaft to obtain the cubical contents; this is a rational rule.

C. A. M., of Iowa—If a patent can be obtained, you should not neglect it; having considered the matter well, this is the best advice we can give you.

S. S., of N. Y.—We have joined two pieces of a vulcanized india rubber shoe together, by a cement of gutta percha, made by dissolving shreds of this substance in turpentine till it becomes a paste, then putting some of it on the edges of this india rubber, and applying heat till it was quite soft, then joining the edges together and pressing firmly with a flat iron.

T. R. T., of Philadelphia—Consult some physician in your place about the use of sulphur; we do not wish to take the responsibility of prescribing for diseases.

R. I., of Wis.—The sketch of your alleged improvement in scales for the surveyor's compass has been examined; it seems to be a good thing, but we do not think it probable that it could be secured by patent; it is difficult to found claims upon such devices.

A. J. B., of Boston—The English door spring to which we referred you, had only one rod or spring; this is immaterial, however.

R. L. C., of Tenn,—The Woodworth Patent, on Planing Machines, expires in 1856, and we do not think it possible to get it renewed; we cannot say which rotary machine is capable of doing most work—the Norcross machine, we think, but we would advise you to write to Norcross about it.

D. S. S., of Pa.—We do not attend to selecting implements for farmers' use: we would advise you to visit some extensive Agricultural Warehouse, and examine the different improvements most generally in use; we cannot think of any back numbers which contain the information you seek.

M. L., of N. Y.—Patents have been granted for machines for cleaning streets. Bishop, of Easton, Pa., has a patent for such a machine. See Vol. 3, Sci. Am.

C. D., of Ohio—Several inventors have sent us the same plan of a marine cut-off within a few days, but the idea is quite old; a patent was refused for the same thing some years ago on the ground of want of novelty.

G. W. S., of Vienna—You must consider the subject again. If you increase the power by decreasing the speed, how will that help you, any more than gaining power from a high velocity of fall to make a slow wheel pump back all the water. If the wind is blowing the boat backwards at the rate of twenty knots per hour, how will it go ahead by decreasing its speed.

J. M., of S. C.—All varnishes become yellow by exposure to the light; we are not acquainted with a single exception, but copal varnish much sooner than that of gum mastic.

A. C., of Ct.—Your suggestions are not unworthy of our attention; it is not easy to please every one, and our purpose is to publish no other than reliable information; we are sorry to learn of your misfortunes; the improvements in crutches appears to be a good one but not new.

S. W., of Mass.—An engraving of your invention could not, we think, be prepared for a less sum than we named. Your ideas about war vessels are new so far as we can judge, but we do not apprehend any advantages not already secured in the construction of frigates of war. Perhaps, however, we are mistaken, and it might be well for you to submit your ideas to a ship builder.

G. H. C., of N. J.—The caveat fee is $20; your improvement appears to be good and new. The work to which you refer is not useful for a practical engine builder. The English stationary engines are all condensing, and mostly of the beam kind.

J. McK., of N. Y.—Punches for making the teeth of saws are common; they are called "saw gummers;" perhaps yours is an improvement over those in use.

G. R. W., of C. E.—Both engines are yoked to the same shaft, so your plan would not be of any use.

J. E., of Ohio—A cement for burr stones, composed of alum and plaster of Paris, burned together, then ground and made into a paste with water, we have been assured, is good for the bad joints of burr stones.

J. S., of Va.—The blue color is given to steel by the degree of heat to which it is carried when taken out and cooled. You can do this with any polished steel tool. Some temperers of tools use a bath of molten lead; others use one of boiling linseed oil, but it requires practice to acquire the skill of the eye to take out the tool at the proper moment. You will obtain this by practice, if you perserve.

J. B. M., of R. I.—We never saw coffee roasted by steam, but it can do it in a close vessel.

C. G. H., of R. I.—Moffitt's applied chemistry, to candles and soap, is the only work we are acquainted with. It is sold by H. C. Baird, Philadelphia.

J. E., of Pa.—Use some pulverized alum mixed with your tar and charcoal.

A. S., of Mass.—Machines for planing irregular forms have been patented but we do not know how successful they have been in planing ship knees, ribs, etc.; we do not know of a cement capable of doing what you require of it.

W. E., of N. Y.—The arrangement of your apparatus for filtering water is differing from others, but the substances used for the purpose are well known; we think a patent may be secured for it.

C. R., of N. Y.—The sketch of your sewing machine has been examined, and we think well of it; it will make a simple and effective machine we think.

J. W. H., of R. I.—The letter has no reference to us, although there is an evident intention that it should; you will very naturally conclude that the medium of communication envelopes the whole subject in considerable moral uncertainty.

J. L. B., of Pa.—The gloss you refer to on linen is put on with the iron.

C. S., of Ind.—We are not acquainted with any company that would be willing to enter into the arrangement you suggest, but we wish you success, and would fondly hope to see you flying yet on a stronger wing than a wild turkey, whose flesh we more admire than its flight.

J. S., of N. Y.—In regard to the distribution of exhaust steam under the furnace of a boiler, we would state that it is not new; we saw the same thing as far back as 1840, and it was not then supposed to be new, as it is described in some old English work on the steam engine; we believe Hebert and Galloway. It was not then supposed to do more than create a draft, and heat the draft air to effect a more perfect combustion, but we are inclined to believe that the steam is decomposed, and the oxygen which forms a part of it set free to combine with the carbon of the fuel and intensify the combustion; in that case the hydrogen being set free, would burn, if it could receive a proper supply of oxygen.

G. B. C., of ——.—Your drill and disk cutter strikes us as being patentable; we are glad to hear that the reception of your patent gives satisfaction. $25 received; all right; you have our thanks.

J. W., of Ohio—Your mode of hanging the slats of horizontal wind mills is new; the current water wheel is old; if you want to stop any one else from patenting you must secure the grant yourself. If a poor ox came along to eat, you certainly would not let a dog lay in the manger and bark the animal off; would you?

L. P. S., of Ct.—We are by no means disposed to discredit your testimony in regard to spiritual manifestations, neither would we attempt to interfere with freedom of thinking upon the subject. Since the time we replied to a correspondent that we had not seen 'manifestations,' we passed an evening in examining the workings of a medium, and are thoroughly convinced that our exposition as given in the last number is the correct theory.

W. H. K., of Miss.—We cannot advise you to make an application for a patent on your alleged improvement in plows. In our opinion there is not the slightest chance for a patent on it.

J. F. O., of S. C.—By exposing the steam, as well as the water surface of a boiler to the action of the flames, would prove very destructive to the boiler, therefore we cannot recommend it.

J. S. G., of Va.—We are not as yet prepared to fully endorse the apparatus to which you refer. It may be somewhat improved we think.

C. S., of Mass.—Combined truss suspension bridges are not new. As you give no idea of your plan, we cannot judge of its merits. We note your remarks on the patent laws.

G. S. C., of Ill.—There is nothing new in your method of reducing friction of the journals of car and locomotive axles, by the use of friction rollers. In Pambour's work on Locomotives, you will find substantially the same thing; we have also seen it in models presented to us for examination.

J. H. W., of N. Y.—We like to hear of apprentices who are faithful to their employers, and we hope you will meet with good success in the trade which you have chosen. Dewitt & Davenport, 160 Nassau street, keep Ranlett's Architect for sale; the 2 vols. are $12, bound.

S. H. L., of N. Y.—India rubber can be reduced to a liquid in hot turpentine or naphtha; it can be hardened again by heat and sulphur, vulcanized, or hardened to a certain degree by heat alone; we do not think a patent could be obtained for a new drug independent of its application.

J. W. B., of N. Y.—No, you cannot make and use a patented unmarked article with impunity; but you are right respecting the requirements of the law, to have all patented articles marked with the date of patent; the penalty is $100 for each offence.

J. M., of N. J.—Letters not signed with the name of the writer are not attended to.

L. F. H., of Vt.—Your alleged improvement in wrenches is a good one, but we do not think it embraces any novelty. We have had wrenches in our office which were made on essentially the same plan.

J. W., of Pa.—We have had several sketches of marine governors sent to us which embraced the same principle as yours. It is not new, useful, or patentable.

P. O'G., of N. Y.—We have no rule which we can recommend for furrowing millstones.

W. T. Dale, Connersville, Ind.—Wants to procure a machine for tenoning spokes of all sizes.

J. G. M., of Pa.—There is not, in our opinion, any chance for a patent on your washing machine. Its principle of operation is the same as the old fashioned fulling mill. The change in the mechanical arrangement is immaterial.

D. W. C. McC., of Mass.—Your ideas about marine governors appear not to possess anything new. We have had similar suggestions presented since our notice of Mr. Seward's speech on the engine.

Money received on account of Patent Office business for the week ending Saturday, March 3:—

J. E., of Mass., $30; R. L., of Ct., $27; W. W., of N. Y., $30; D. W. P., of N. Y., $28; J. T., of N. Y., $30; J. & W. L., of Ind.; $55; S. L. M., of N. J., $25; E. G., of Vt., $30; J. J. D., of Ct., $30; J. J. S., $55; T. J. B., of Ct., $65; W. & McF., of Pa., $25; J. W., of Ga., $10; E. P. M., of Mass., $30; J. G. & Co., of R. I., $15; C. & D., of Va., $30; D. T., of N. Y., $10; C. M. D., of N. Y., $30; H. & R., of O., $12; W. H., of Pa., $55; W. S., of Ohio; $25; F. C. G., of N. Y., $30; B. D. S., of Va., $70; H. K. McC., of Pa., $55; S. J. R., of O., $35; C. R., of O., $55; J. B. S., of Ct., $30; T. W., of Ill., $30; A. B., of Ct., $30; T. G., of R. I., $30; S. R., of Pa., $60; C. Van H., of Mass., $25; V Scale Co., of Vt., $500; E. W., of N. J., $25; E. R. G., of L. I., $25; C. H. P., of N. Y., $12; C. W. P., of N. J., $15.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, March 3:

M. & G., of Pa.; E. M., of N. J.; E. B., of O.; D. W. P., of N. Y.; J. S. P., of N. Y.; E. D. C., of Ct.; S. L. M., of N. J.; E. R. G., of L. I.; C. H. P., of N. Y.; W. & McF., of Pa.; W. S., of O.; J. G., of N. Y.; C. W. P., of N. J.; T. G., of R. I.; J. B. P., of France; B. D. S., of Pa.; H. K. McC., of Pa.; G. M. S., of S. C.; C. Van H., of Mass.

Important Items.

Models—We are receiving almost daily, models of inventions which have not the names of their inventors marked upon them. This usually prevents us from taking any notice of them whatever. We shall esteem it a great favor if inventors will always attach their names to such models as they send us. It will save us much trouble, and sometimes prevent the model from being mislaid.

Receipts—When money is paid at the office for subscriptions a receipt for it will always be given, but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgement of the receipt of their funds.

Back Numbers and Volumes—We have the following numbers and volumes of the Scientific American, which we can supply at the annexed prices:—Of Volume 5, forty numbers; price in sheets, $1; bound, $1,75. Of Volume 6, all; price in sheets, $2; bound, $2,75. Of Volume 7, all; price in sheets, $2; bound, $2,75. Of Volume 8, none complete, but about 30 numbers in sheets, which will be sold at 50 cents per set. Of Volume 9, complete in sheets, $2; bound, $2,75.

Patent Claims—Persons desiring the claim 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 $1 for fees for copying.

Terms of Advertising.

4 lines, for each insertion,	$1,00
8 " "	2,00
12 " " "	3,00
16 " " "	4,00

Advertisements exceeding 16 lines cannot be admitted, neither can engravings be inserted in the advertising columns at any price.

☞ All advertisements must be paid for before inserting.

Science and Art.

History of Reaping Machines.—No. 22.

On September 7th, 1852, D. Fitzgerald, of New York, obtained a patent embracing four claims ; the principal feature being two vertical slotted cylinders, which have curved fingers, and rotate towards one another, gathering in the grain and directing it behind after cut to a place of deposit. It was on exhibition at the last New York State Fair. (See claims page 6, Vol. 8, Scientific American.) On Nov. 23, same year, John H. Manny, of Waddams Grove, Ill., obtained a patent embracing four claims published on page 94, Vol. 8, Sci. Am. None of these refer to the cutting or reel parts. One relates to a scraper and the driving wheel whereby the latter runs in the swath cleared by the previous cut ; the second relates to projections on the under side of the upper bars of the finger, in combination with a chamber on the lower corners of them, to counteract the tendency of wire grass to pass in between the cutter bar and the sides of the recess in which it is guided. The third relates to forming the guard fingers in two parts, and so interlocked as to prevent the grass lodging in the joint. The fourth relates to the combination of a movable platform with the seat. On Dec. 7th, same year, a patent was obtained by C. B. Brown, of Griggsville, Ill., for the combination of the crown wheel with the shafts, having pulleys acted upon alternately by the cogs of the wheel, the shafts being connected so as to turn in opposite directions, and vibrate the cutting blade, (see claim, page 110, Vol. 8, Sci. Am.) On the 14th of the same month, Wm. H. Seymour (assignor to himself and Daton S. Morgan, of Brockport, N. Y.,) obtained a patent containing two claims. The claims embrace a manner of supporting the seat to allow greater freedom to the raker and discharger of the grain ; also a method of protecting the gearing in a supplementary metallic frame, (see page 118, Vol. 8, Sci. Am.) On the 21st following, J. L. Ream, of Mount Pulaski, Ill., obtained a patent on a corn stalk harvester, (see claim on page 126, Vol. 8, Sci. Am.)

On the 5th of April, 1853, J. D. Burrall, of Geneva, N. Y., obtained a patent embracing two claims, the first being for an additional apron to convert the rear into a side discharge. The second embraces an adjustable journal box, to preserve the relative positions of the cogs of the gearing, and allow of the raising and depressing of the driving wheel, (see claim on page 246, Vol. 8, Sci. Am.) On the 19th of April, John H. Manny, of Waddams Grove, Ill., obtained a patent embracing the forming of the lower part of the finger, or the upper, or both, with a recess on either side in front of the finger bar, and an angular ridge between the two recesses, to cut entangled fibers, to prevent the clogging of the cutting apparatus, also for making the fingers with the sides of the upper half overhanging those of the lower half. This improvement was patented in England on the 9th of December previous, (see the two claims on page 262, Vol. 8, Sci. Am.)

J. A. Wagner, of Poultney, N. Y., obtained a patent for a clover harvester, having a hollow cylinder with knives on its periphery, to act in conjunction with a fixed knife so as to cut off the clover heads between them, (see two claims, page 302, Vol. 8, Sci. Am.) On the 14th of June following, a patent was granted to Wm. G. Huyett, of Williamsburgh, Pa., embracing two sets of cutting knives, the one set working directly over the other set, each receiving a reciprocating motion and a drawing cut by the bar of the lower cutters, and that of the upper cutters being connected—the one at the front and the other at the back end—to a vibrating lever operated by the common crank, which shoves the upper cutters to the one side, as it draws the lower ones to the other side. This plan will be understood by every one acquainted with mechanism, (see claim on page 326, Vol. 8, Sci. Am.)

Improved Caster for Billiard Tables.

The accompanying engravings represent an improved caster for the purpose specified in the above caption, invented by F. L. Roux, of Charleston, S. C., and for which measures have been taken to secure a patent.

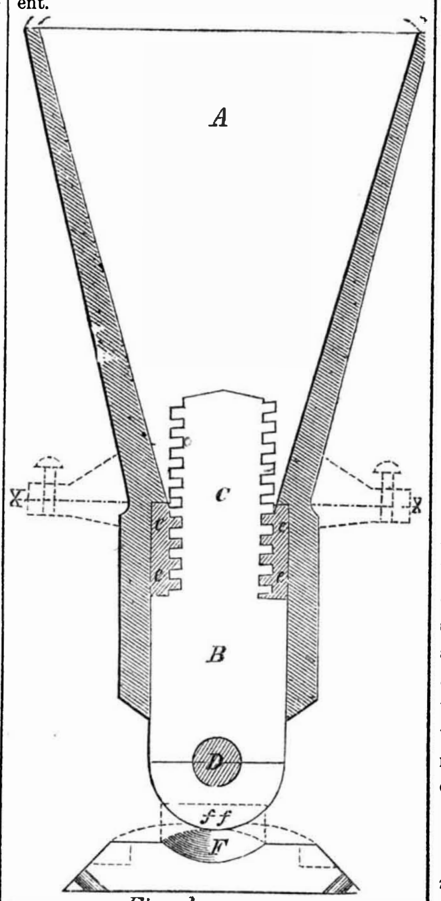
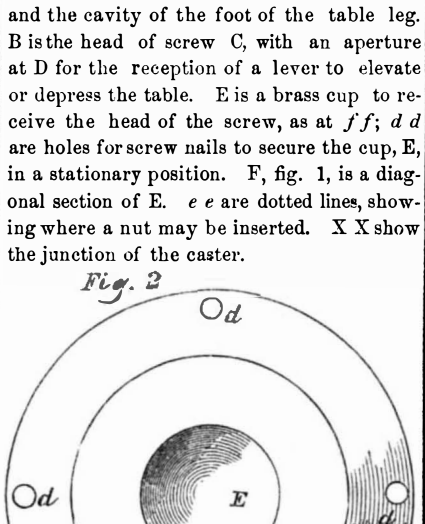


Fig. 1

Fig. 1 is a vertical section, and fig. 2 is a horizontal section. A is the half section of the caster, showing the arrangement of the screw and the cavity of the foot of the table leg. B is the head of screw C, with an aperture at D for the reception of a lever to elevate or depress the table. E is a brass cup to receive the head of the screw, as at *f f*; *d d* are holes for screw nails to secure the cup, E, in a stationary position. F, fig. 1, is a diagonal section of E. *e e* are dotted lines, showing where a nut may be inserted. X X show the junction of the caster.

Fig. 2



The nature of the invention consists in the application of the screw, C, to the caster, whereby the table can be elevated or depressed by turning the screw to the right or left, by a lever inserted in D, as has been described. Billiard tables require to be set perfectly level ; by this caster, a table can be so set in a very few seconds, a spirit level being used to true it. It is a fact well known to billiard players, that a table will sometimes draw (as it is termed) at a particular point ; in other words, a ball, after having received its impulse, will incline from a direct course towards a certain pocket or a point on the table. This is caused by the table not being truly level. Such a table is shunned by good players. By testing a table having these casters on it by a spirit level, it can always be kept perfectly level, to the satisfaction of all parties. This improvement might be profitably applied to writing tables and school desks.

More information can be obtained by letter addressed to F. L. Roux, care of S. S. Farran & Bros., Charleston, S. C.

The Expected Great Comet.

The eminent astronomer, M. Babinet, member of the French Academy of Sciences, gives some very interesting details relative to the return of that great comet, whose periodical course is computed at three hundred years.

It was observed in the year 104, 392, 682, 975, again in 1264, and the next time in 1556, always described as shining with the most extraordinary brilliancy. Most of the European astronomers had agreed in announcing the return of this comet in 1848 ; but it has hitherto failed to appear. In fact, it is not so easy or simple a matter to compute those vast cyclical periods as some superficial persons, who do not look beyond the day of the year in which they live, may imagine.

We are assured, however, by M. Babinet, that, up to this moment, this beautiful star "is living on its brilliant reputation." We are now informed that a celebrated and accurate computer—M. Bomme, of Middleburgh—has gone over all previous calculations, and made a new estimate of the separate and combined action of all the planets upon this comet of three hundred years ; and he has discovered that it is not lost to us, but only retarded in motion. The result of this severe labor gives the arrival of this rare and renowned visitor in August, 1858, with an uncertainty of two years, more or less ; so that between 1856 and 1860 those who are then living may hope to see the great luminary which in 1556 caused Charles V. to abdicate.

Spots on the Sun.

A correspondent of the Providence *Journal* states for the information of those who believe that there is a connection between the temperature of our planet and the state of the sun's disk, that there are now two spots on the sun of uncommon size and great regularity of figure, almost circular, which are surrounded by a penumbra, very distinct, also circular.

In 1851, we remember, Prof. Faraday, in one of his popular lectures, stated that "the variations in the magnetic force of the earth appeared to have relation to the spots of the sun, which for a period of five years advanced, and then receded for an equal space of time."

A corresponding influence by other observers had been witnessed with respect to the "Aurora Borealis." We are but students yet with respect to our knowledge of magnetism ; it is an influence which pervades all space.

Lard Candles.

A. Parmelee, writing to the *New England Farmer*, gives the following receipt for making lard candles :—

"For 12 lbs. of lard, take 1 lb. of saltpeter and 1 lb. of alum, mix them and pulverize them ; dissolve the saltpeter and alum with a gill of boiling water ; pour the compound into the lard before it is quite all melted ; stir the whole until it boils ; skim off what rises ; let it simmer until the water is boiled out, or till it ceases to throw off steam ; pour off the lard as soon as it is done, and clean the boiler while it is hot. If the candles are to be run, you may commence immediately ; if to be dipped, let the lard cool first to a cake, and treat it as you would tallow.

Statistics of Grease.

The Cincinnati *Price Current* has some interesting statistics on the lard produce of this country. The number of hogs killed the last season and packed for commerce is three millions. The average amount of lard per hog, is 32 pounds. The total amount of lard in commerce is estimated at ninety-six millions of pounds. Of this amount, twenty millions are shipped from Cincinnati. England and Cuba take more lard of us than all the rest of the world. Each of these countries buy over eight millions of pounds. In the West Indies lard is very generally used as a substitute for butter. Lard oil is made more extensively at Cincinnati than at any other point in the Union. Thirty thousand barrels of it are annually sent from that city. The demand for lard over the world is on the increase, and prices will probably be sustained.

To Make Artificial Stone.

Take 180 lbs. pitch, 4½ gals. coal oil, 18 lbs. resin, 15 lbs. sulphur, 44 lbs. finely powdered lime, 180 lbs. gypsum, 25 cubic feet of sand and stone, broken to pieces, and passed through a half-inch sieve. The sulphur is first melted with about thirty pounds of pitch, after which the resin is added, then the remainder of the pitch with the lime and gypsum, which are introduced by degrees, and well stirred. It is then molded into blocks, and pressure is applied to them in the molds. The artificial stone hardens in about a week.

To Varnish Articles of Iron and Steel.

Dissolve 10 parts of clear grains of mastic, 5 parts of camphor, 15 parts of sandrach, and 5 of elemi, in a sufficient quantity of alcohol, and apply this varnish without heat. The articles will not only be preserved from rust, but the varnish will retain its transparency and the metallic brilliancy of the articles will not be obscured.

LITERARY NOTICES.

Blackwood's Magazine—The February number of this old and able magazine, published by L. Scott & Co., No. 54 Gold street, this city, contains eight capital articles on various subjects, the "Story of the Campaign," continued, and part three of "Zaidee," a romance. The story of the campaign is written by an officer in the British army in the Crimea ; he describes what he sees, and what he knows to be true.—There are reviews of the life of Lord Metcalf (once Governor of Canada,) and of that late eminent naturalist, Prof. Forbes, and one of Bulwer. One tremendous article, entitled "The Revelations of a Showman," is a review of the autobiography of P. T. Barnum. It is the most scorching and severe article we ever read : it is enough to make the object shrink into a pint vinegar bottle. It is a tip-top number ; those who wish to get the best foreign monthly magazine in the world, at only $3 per annum, should send in their names at once to Scott & Co.

Putnam's Magazine—For March, is a very fine number ; it contains articles upon "The Mormons," "The Cossacks," "The Hawaiian Islands," "Genius of Charles Dickens," "Wind and Sea," continuation of "Israel Potter," and a number of others of high literary merit. This magazine deserves the highest success, and should become standard in every household. G. P. Putnam & Co., No. 10 Park Place, publishers.

The National Magazine, of Literature, Art, and Religion ; Carlton & Phillips, 200 Mulberry street. This very interesting magazine for March contains interesting articles upon Turkey, John Bunyan, Lost Tribes of Israel, and other rare and instructive matter.