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Useful Varnishes.

ROSIN OIL AND GUTTA PERCHA VARNISHES—A varnish of a very adhesive quality, and completely resilient to moisture, may be prepared with rectified, or raw rosin oil and gutta percha. Three parts by weight of gutta-percha of commerce are put into a vessel containing nine parts of raw oil of resin, obtained by the destructive distillation of ordinary resin; and this mixture is submitted to a temperature of 60° Fah., stirring from time to time, until all the gutta percha is dissolved. The varnish thus prepared is well adapted for coating ordinary articles, such as waterproof coverings for wagons, tarpauling, &c.

ROSIN OIL AND GUM MASTIC VARNISH—A colorless varnish may be manufactured from rectified essential oil of resin, mixed with from 1-10th to 1-6th of its weight of sulphuric acid, of a specific gravity of not less than 1·700, and the mixture is agitated, and the essence again rectified by means of a current of steam; by which means a colorless oil is produced. In this state, damar resin or mastic is dissolved in four times its weight of this rectified essence by a gentle heat.

A varnish of inferior quality may be obtained by employing oil which has only been once rectified, and which has not been treated with sulphuric acid. The proportions of all the ingredients may be varied according to the quality and the nature of the varnish desired to be obtained.

Turning Lathe.

On the 20th of last February a patent was granted to Wm. Stephens, of Richmond, Ind., for an improved slide rest in lathes, represented by the accompanying engravings, figure 1 being an end view of the lathe, and figure 2 a side view of it. The same letters refer to like parts.

This invention consists in the peculiar arrangement and attachment of the puppet head to the lathe, whereby it (the puppet head) may be adjusted so as to turn articles between centers, as in an ordinary lathe, and the puppet head be also adjusted so as to be used as a slide rest for facing off plates properly chucked in the lathe.

A represents the bed of the lathe, having the usual stationary head, B, at one end, on which a spindle, C, works in suitable bearings, said spindle being provided with a cone of pulleys, D; E is the rest which works on the rod, F, at the side of the bed, A, the rest being provided with a set screw, G, for the purpose of securing it at desired points on the rod, F; H is a rectangular socket or collar which works on the bed, A, which is also of rectangular form. To one side of the socket or collar, H, there is secured a sector frame, I. The socket or collar may be secured at any point on the bed, A, by a set screw, H'. J is the puppet head, the lower part of which is fitted on the arc, *b*, of the sector frame, so that it may move back and forth therein. To the lower end of the puppet head there is

IMPROVED TURNING LATHE.

Fig. 1

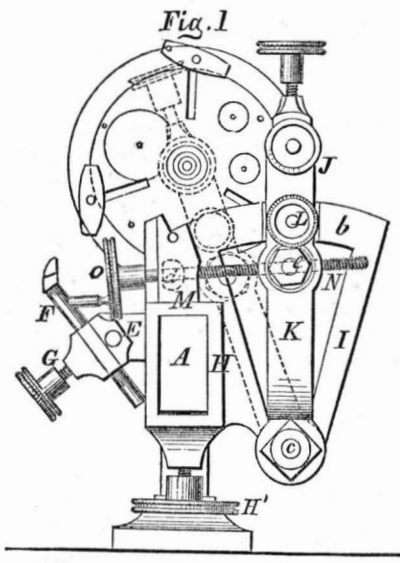
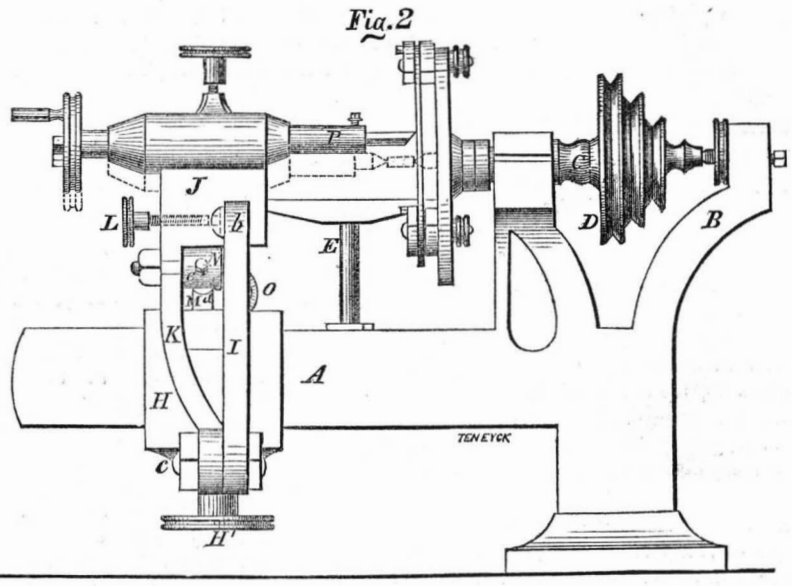


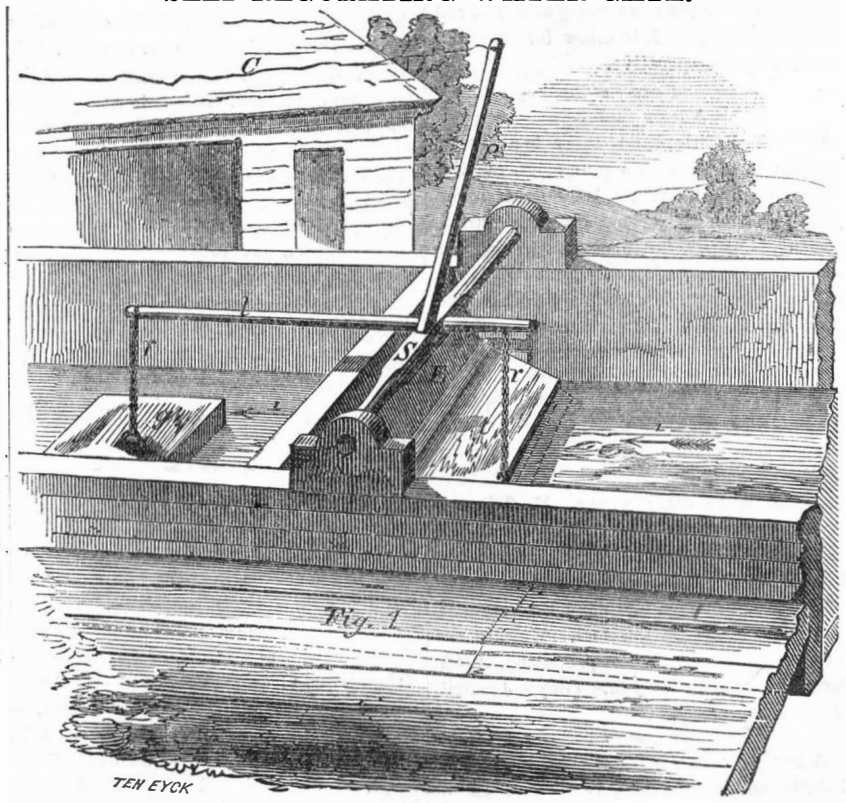
Fig. 2



attached an arm, K, the lower part of which is secured by a bolt, *c*, to the lower end of the sector frame, the arm being allowed to turn on the bolt. L is a set screw, which passes through the puppet head for the purpose of securing it at any desired point on the arc, *b*. On the upper part of the socket or collar, H, there is a projection, M, through which a screw rod, N, passes, said rod, N, having upon it a ball, *d*, which fits or works in corresponding cavities in the projection, M. The screw rod, N, also works in a nut, *e*, attached to the arm, K, of the puppet head. The nut, *e*, is not permanently attached to the arm, K, but is allowed to turn on the arm. O is a hand wheel at one end of the screw rod, N; P is the mandril of the puppet head, constructed and arranged in the usual manner. The inner end of the mandril is provided with a recess, so that either a point or cutting tool may be inserted therein. When the lathe is to be used for turning by placing the article between the centers of the two heads, the puppet head, J, by turning the screw rod, N, is brought in the position shown in dotted lines, and a point being inserted in the inner end of the mandril, P, the points of it, and spindle, C, will be in line, the puppet head is then secured to the arc, *b*, by operating or adjusting the set screw, L. The lathe may now be used as an ordinary turning lathe. But if plates require to be faced off, they are chucked in the usual manner on the inner end of the spindle, C, the rest, E, is thrown back, and the set screw, L, is relaxed. Now, by moving the puppet head back and forth upon the arc, *b*, by turning the screw rod, N, the puppet head is converted into a slide rest, a cutting tool being placed in the inner end of the mandril, P, instead of a point. A series of circular plates may all be cut of the exact size upon a chuck by securing the puppet head on the arc, *b*, at the proper point. This lathe is valuable to watch makers, and other artisans. It is extremely simple, not liable to get out of repair, nor expensive to manufacture, and should therefore meet with general attention.

More information may be obtained by letter addressed to Mr. Stephens, at Richmond, Ind.

SELF-REGULATING WATER GATE.



The accompanying figure is a perspective view of a self-regulating water gate, for which a patent was granted to G. N. Todd, of Dundaff, Pa., on the 20th of February last.

The arrows, 1 1, show the direction of the water running in a canal or flume of mason, work. E represents a solid back of mason, or wood work built across the canal, and in which is the throat or water vent of the gate or sluice, *t*. The back, E, is inclined outwards, and the gate is represented in an inclined position, which, in most cases, will be the most convenient. The gate is a flap or swinging one, and is hung at the top by side gudgeons in proper boxes. Its lower end or sole is connected to a lever, *l*, by a chain, *r*. This lever has an axle fulcrum, S, which turns in journal boxes. *g* is a float attached to the back end of lever *l*, by another chain, *r*. The dotted lines show the space of the gate that is open. It will be observed, that according as the float, *g*, rises and falls, so will the gate, *t*, be elevated and depressed, and thus increase or diminish the amount of gate opening. P is a pole or arm of any desired length, secured to the axis fulcrum of the gate lever. C is a cord or chain attached to P, and may be of any length. By drawing on this cord the gate, *r*, will be opened. The arm, P, is set to slant up stream when the gate is shut, so as to have it stand perpendicular when the gate is opened full head. It will be observed, that as the float regulates the opening of the gate by its gravity, and the position at which it is suspended on the lever, *l*, the amount of water desired to pass uniformly through the gate, can be regulated by the distance at which the float is hung from the fulcrum, S.

The construction and operation of this gate will be understood by all, and requires no further explanation.

Mr. Levi Decker, of Lenox, Pa., is now a partner with Mr. Todd in the patent. More information may be obtained by letters addressed to him or Mr. Todd.

Power of Cocoa.

Professor Johnstone, in his "Chemistry of Common Life," states, that by the use of cocoa leaf, the Peruvian Indians undergo the most incredible labor. He says; "With a feeble ration of dried maize or barley crushed into flour, the Indian, if duly supplied with cocoa, toils under heavy burdens, day after day, up the steep slopes of the mountain passes, or digs, for years, in the subterranean mines, insensible to weariness, to cold, and to hunger. He believes, indeed, that it may be made a substitute for food altogether."

Some of our cotemporaries state that J Campbell, of Columbus, Ohio, has lined the axle boxes of locomotives with glass, to lessen the friction of the journals. Who will give us the result of his experiments?

The Art of Dyeing—No. 15.

PURPLE ON SILK—This color on fine wool was the most famous in ancient times, and the city of Tyre was distinguished for dyeing it. It was a badge of power and wealth, as monarchs and rich men only could buy it. It was, however, somewhat different from what is now known by the name of *purple*, it being a deep crimson, like clotted blood, while the modern purple is a blue tinged with red. It is dyed on silk in the plum vat, just in the same manner as upon cotton, and as described on page 218. All the shades of lavender can also be done in the same manner as the plum colors on cotton. But there are other methods of dyeing purple on silk, very different from the processes of cotton dyeing.

ALUM PURPLE—This is the most simple method of dyeing purple on silk. It consists in preparing the silk in an alum tub or mordant, at about 3° Twad., for an hour, then dripping them, and washing in two tubs of clean water, after which they are handled in hot logwood liquor (about 5 lbs. of dyewood to ten of silk) for half an hour, and lifted.—Into the logwood liquor about a wine glassful of the muriate of tin is added for every ten pounds, the liquor stirred up, and the goods again entered. Five turns will finish, when they may be lifted up, washed, and made ready for drying. The redder the shade desired, the more spirits are added for *raising*. The old plan of dyeing simple logwood purple on silk, was to use spirits, cream of tartar, and logwood all together, heated up in a copper kettle to a scalding heat, and handle in this till the color was full. It is not so sure, cheap, nor quick a method as to use an alum mordant, the logwood by itself, and then *raise* with the spirits.

COCHINEAL PURPLE—A beautiful purple can be dyed on silk by dyeing a good cochineal red on it, as described on page 154, then bluing on the top, by a bath of cudbear and pure liquid ammonia. Dyers use urine in place of pure ammonia, for cheapness. One pound of cudbear will answer for ten pounds of goods. The ammonia must be pretty strong, and the goods handled at a good heat until the desired shade is obtained. This is a very rich color, but expensive. The goods must be well washed before they are dried.

PEACH BLOSSOM COLOR—This color is dyed on silk with cudbear and ammonia liquid, or urine. The quantity of cudbear must just be proportioned to the depth of shade desired. Four ounces will color one pound of silk a full shade.

ARCHIL SHADES—Beautiful shades, between a ruby and purple, are dyed with archil.—They are dyed at one dip, in liquor kept at a scalding heat. Neither cudbear nor archil colors are fast, although they will stand washing in cold soap suds. By exposure to the sun and air, they soon fade and become rusty.

CLARET—This color is simply a deep purple. It is dyed by preparing the silk in an alum mordant, as for simple purple, dyeing a good full red with peachwood on it, and then darkening with logwood to the desired shade. The logwood should never be added until the goods have obtained a deep red color. It has been discovered, that it takes twice as much peachwood to produce the same effect when the logwood is given before the peachwood, as afterwards.

MAROON—This is simply a peachwood red slightly darkened by adding a little logwood to the red liquor. To make a rich maroon, and a rich claret, a full red is positively necessary, as the base of the color. Brazil wood is more economical for use than common hypernic wood, although the price is higher. It yields a greater quantity of, and a superior color.

LILAC—A very simple lilac can be colored by preparing the silk in alum for about twenty minutes, then giving a very weak logwood liquor. All shades of lilac, however, can be colored with archil and cudbear. The goods must be white for all these colors, except claret.

The purples that are dyed in the plum tub may be blued deep, by running them afterwards through a dilute solution of chemic (sulphate of indigo).

ARCHIL AND CUDBEAR—These dye drugs are made from the lichen rocella, a species of sea weed. The best comes from the Cape de Verd Islands, but it is found in many other countries. It is steeped for about a month in a close cask, in a solution of urine, when it ferments, after which it may be used, and in this state is called "archil." Cudbear is a powder of these lichens. Archil and cudbear colors require no mordant. Many experiments have been tried with archil in order to color cotton with it, but hitherto they have all proved abortive. If it could be dyed on cotton, and rendered permanent, it would be a grand triumph for practical chemistry.

Charcoal Furnaces.

The improvement in charcoal furnaces for which a patent has been obtained this week by John McNeil, of this city, whose claims are on another page, relate to reburning the animal charcoal used in sugar refining. The object of the improvement is to prevent the sagging and rapid destruction of the retort tubes in the charcoal burners of sugar refiners, caused by intense heat. In the improved furnace the tubes are supported near the middle of their length by hollow or tubular beams, one end of each entering the chimney, the other end is open, and receives cold air from the exterior of the furnace. The draft of the chimney causes a constant current of cold air to pass through the beams, and thus prevent them from being burned out, and from failing to give an efficient support to the retort tubes.

Power Loom Shuttle Guard.

The improvement in power looms, for which a patent was granted (as appears in the list of this week's claims) to David S. Harris, of Coventry, R. I., consists in the connection of the shuttle guard with the belt shipper in such a manner that the shuttle guard is in its operative position only while the loom is out of gear, the guard is raised so as to be out of the way of the attendant while picking out, or drawing threads through the reed, &c. When the loom is in gear the shuttle-guard lies over the shuttle race in such a position, that the shuttle passes between it and the reed, and cannot possibly be thrown out of the loom. But when the belt is unshipped, it throws out a connecting arm and rod that raises the guard, to allow for access to the reed by the operative.

A Deep Spring.

On Lake Prairie, Iowa, there is a spring, the bottom of which no plummet has ever yet sounded. It has a false bottom about three feet from its surface, through which if a twenty foot pole be thrust, it will sink under the sand composing this crust-like layer, and in a moment after its disappearance will bound up again on the surface.

The Scientific American.

This is decidedly the very best paper of the kind that we know of, and ought to find a place in every family circle, as it contains a large amount of valuable reading that can be found in no other paper. Mr. Tilley is agent for it in this place, and we learn from him that its circulation is rapidly increasing. We believe the idea that this paper is interesting only to mechanics has been very general, but such is not the fact. We care not what may be your trade or profession, it will interest and instruct you.—[Boy's Journal, Ogdensburg, N. Y.

A mechanic who is intelligent, temperate, industrious, and honest, it matters not of what trade, may secure the respect and confidence of the community and a competency to himself. He may have the means of happiness in his own family, and the power of communicating happiness to others.

A young man who spends his leisure time in novel reading, may think he is improving time in studying, but he will find at length, that such studies will make him a lean and barren scholar.

Improved Dredging Machine.

On the 9th of last January, Dean S. Howard, of Lyonsdale, N. Y., obtained a patent for improvements on dredging machines embracing no less than ten different claims, thus showing that his machine involves as many improvements. Of course, it is expected that its operative qualities must be of a very superior character. We have just been furnished with a tabular statement of the performance of one of his machines, by J. W. Nystrom, C. E., Philadelphia, in which we find the amount excavated in 5 hours 14 minutes to be no less than 1,075 cubic yards. This was in the South Bay, Whitehall, N. Y. This is a performance unequalled by any other dredging machine, within our knowledge. It was constructed for the United States Government, by Mr. Howard, who has built fifteen dredging machines for the United States and Canada, and has worked them all, more or less, and thus acquired great experience, as it regards their defects, and the requirements necessary to render them more perfect in every part. The improvements he has made relate to the dredging machines having a revolving chain of buckets, and best suited to the improvement of rivers and harbors, canals, &c. These improvements embrace a superior construction of the buckets, and also a superior mode of securing them to the endless chain, whereby they can be attached and detached rapidly from the chains when out of order, and replaced by others. The chain and frame of buckets can be very quickly raised when the position of the boat has to be changed, and the whole machinery is so arranged as to admit of adaptation to all locations under all conditions required for excavating under water. The machinery is self-adjusting, to admit of either a backward or forward motion of the engine under any circumstances, without disarranging any part of it. All the parts are made with a view to be easily replaced, when broken or worn out, so that if any part were to fail when in operation, (and such machines are often subject to great and unexpected strains from rocks and sunken logs) and a full quantity of hands in attendance, it can be replaced, without letting down the steam, with but a few minutes' detention. This is a grand idea.

We do not know of any place that more requires an increased number of superior dredging machines than New York; those which are now employed for dredging and excavating in our muddy docks and harbor, are not very creditable to our country. The city of Albany, N. Y., has been complaining for years of the obstructions to navigation in the Hudson River, during low water, on what is called the "Overslaugh," and they have seriously entertained the idea of constructing an expensive canal to surmount the evil—they having employed the State engineer to survey the route and report on it. All they want is the constant employment, in summer, of three such dredging boats as Mr. Howard can build, and it would be well for them not to delay until the navigable channel of their river is completely filled up, in the vain hope of Uncle Sam doing the work for them.

Lighthouses.

Since our old lighthouse system was revolutionized a few years ago, a great improvement in the character of the lights and their management, has been the result. This has been chiefly through the adoption and erection of the French lights of the celebrated Fresnel, one of whose lights was sold for old iron under the old Lighthouse Board, so badly was it managed. The same light, since then, has been erected on Cape Hatteras, we understand, and is one of the best in our country.

Light houses are of two classes. Those of the first class are designed to occupy the headlands of the coast, to aid the mariner in avoiding the dangers which he is liable to encounter when in their vicinity, and in determining his course from point to point.

The light exhibited by these lighthouses should be of the most intense description which human skill is capable of constructing. A series of lighthouses of this class, is in course of erection on our Pacific Coast, which is anticipated will be equal to any in existence. The second class is for harbor use, and are so constructed that they cannot be mistaken for lights of the first class.

The lights still in general use in this country are formed on the plan of reflecting, by means of mirrors of different descriptions, the light of a large number of oil lamps. This plan has been found very expensive, and far from perfect. The principle of refraction is that applied to lights, under the system perfected by Mr. Fresnel, of the French Lighthouse Board. To such perfection has this plan been brought, that lamps are now in course of construction which will render the light of four one-inch burners equal to 6,600 burners, which can be seen at the distance of fifty miles!

The Fresnel lights are very economical. They do not require the same number of burners as the reflecting apparatus, and require no repair, except to the revolving machinery. The refracting lenses do not depreciate in value, like mirrors, which require constant polishing.

We therefore hope that all the reflecting lights will soon give place to the Fresnel lights in our lighthouses, for being such a great commercial nation we should have the best lighthouse system in the world.

The New Postage Law.

All letters passing through the U. S. mails are, by the new law which went into operation April 1st, *required to be pre-paid*, or they will not be forwarded. We trust that our correspondents will bear this in mind. In writing to us upon any subject they should invariably enclose a stamp for the pre-payment, if they desire or expect an answer. Pay your own postage, both ways, on your own business, is the postal maxim now a-days.

Activity among Inventors.

As an indication of the great activity which at present prevails among inventors, we would state that no less than one hundred and thirty applications for patents and caveats passed through the SCIENTIFIC AMERICAN patent agency during the single month of March. This number, however, includes foreign patents. We have never known a time when inventors were so earnestly engaged as at present. In a late interview with Commissioner Mason, he remarked that the number of applications for patents had of late astonishingly increased.

Railroads Wanted.

The leading merchants of New Orleans, in a memorial to the Legislature of Louisiana requesting that measures be taken to improve the navigation of rivers in the State, say that "from 25,000 to 30,000 bales of cotton, and 50,000 to 75,000 hogsheads of sugar, worth $900,000 to $1,200,000, are now due here by the streams of our State alone, and are kept from our market by the want of navigation."—[Railroad Record.

Coffee Leaf.

Dr. Stenhouse, of London, states that coffee leaves slightly roasted, when digested with boiling water, yield a deep brown infusion, which, in taste and odor, closely resemble an infusion of a mixture of coffee and tea. On the addition of milk and sugar it forms a very tolerable beverage.

Errata—Moving a Boat Against the Wind.

In the article last week on this subject, two typographical errors were made in Mr. Stedman's letter. For *stem*, where the water wheel is placed, read *stern*; and for *longer* than the pinions, read *larger*.

Hon. Chas. Mason, Commissioner of Patents, called upon us last week on his way to Iowa, where he will remain until about the first of May. The Chief Clerk, Mr. Shugart, acts in the capacity of Commissioner in the absence of Mr. Mason, as usual.

The operatives of the cotton factories in Manchester, N. H., have ceased to work, because of a contemplated increase of the hours of labor.

(For the Scientific American.)

Heating Factories with Steam—its Economy.

MESSRS. EDITORS—I have been a constant reader of the SCIENTIFIC AMERICAN since the commencement of the second volume; and I have no doubt that I have received back in dollars and cents, indirectly, ten times the amount the paper has cost me; not to speak of mental advantages.

I like the old-fashioned plan of telling one's experience, not only in spiritual, but temporal matters also. If you think mine will be of any benefit to your 25,000 subscribers, they can have it free of charge.

I have the supervision of an establishment that was erected last summer for manufacturing purposes, requiring a small steam engine as a motive power. We occupy two rooms, forty by sixty feet, which were fitted with pipes to heat by steam direct from the boiler. We found it to save at least forty per cent. of the fuel required to heat by stoves in the usual manner, besides making a much more pleasant and agreeable atmosphere. The room on the first floor has four 3-4 inch pipes on three sides of it. The room above it has three pipes of the same size, and nearly of the same longitudinal extent. The engine is of about four horse power. The boiler is of the locomotive kind, ten feet long, two feet in diameter, with twenty-four 1¾ inch tubes, 7 feet long; with a fire box 22 by 30 inches. The draft returns under the shell. Some two months ago, we connected the exhaust pipe of the engine with the main heating pipe; supposing that in mild weather the heat of the exhaust steam might be sufficient. We opened a communication with the atmosphere by connecting a pipe with the condense water pipe, and extending it outside the building, and in that pipe put a common screw valve. The first mild day after making the above arrangement, I let on steam direct from the boiler until the rooms were sufficiently warm, and then shut off the steam from the boiler, and turned the exhaust steam into the heating pipes. After running a few minutes, I shut the valve in the pipe connecting the condense water pipe with the atmosphere, and the engine continued to work as freely as when it was open. Finding the exhaust steam insufficient for cold weather, it heating the rooms to only about 50°, by way of experiment, I let a little direct steam from the boiler into the pipes in which the engine was exhausting, with no apparent diminution in the speed or power of the engine, though, of course, there must have been some. Since that time, the engine has exhausted into the heating pipes without any communication with the atmosphere whatever. When the weather is so cold that the exhaust will not heat up sufficiently, I increase the temperature by letting in direct steam in connection with the exhaust, thereby saving all the heat of the exhaust, and using but little direct steam in comparison to what would be required to heat the rooms entirely by it.

When using only the exhaust steam, I frequently find quite a strong vacuum in the further extremities of the heating pipes.—When we heated with direct steam alone, we burned 400 lbs. per day of anthracite coal, chesnut size, at $6 per tun. Since we have used the exhaust with the direct steam in connection, we have burned but 250 lbs., which would be insufficient to heat the rooms with stoves. Another important advantage obtained by this arrangement is this: all the steam generated in the boiler is condensed in the pipes, and returned to the cistern at about 100° of heat, and pumped from that, through the heater, into the boiler, at almost the boiling point, where it is again evaporated into steam, and used over again and again, being entirely free from extraneous matter, consequently, causing no incrustations. We frequently use no additional water for three days in succession, so that, in reality, two barrels of water would be an abundant supply for a week. Another advantage is, the steam is condensed and returns to the cistern just fast enough to supply the boiler, and is consequently self-regulating. E. LEACH.

Norwich, Conn., March 26, 1855.

American and English Flour.

In the SCIENTIFIC AMERICAN of the 10th March, there is an extract from Dr. Muspratt's work on chemistry applied to the arts. The doctor is greatly at fault in most of his statements, as is often the case when a person writes upon a subject with which he is practically unacquainted. English millers do not damp their grain prior to grinding; their climate is humid enough at all times for the grain to absorb moisture, and oftentimes in wet harvests, when the grain becomes much sprouted, it has to be kiln-dried, when foreign grain cannot be obtained to mix with it. English flour is best adapted for exportation because their millers bolt their meal cold, and much of the moisture liberated by grinding is allowed to evaporate. We manufacture a whiter article of flour because our consumers require it. I do not think we excel the British in our bolting apparatus, but our people will let the world know they are somebody, and therefore we make whiter flour. I have seen large quantities of inferior western flour manufactured in the east of England, and sold for "Prime English Household." Much American flour shipped to Europe is the *fag-end* of our own—that which we do not want. I presume Dr. Muspratt must have bought a barrel of flour manufactured at the mills where I worked, as I recollect my employer telling me of having shipped some flour to Glasgow, if so, I do not wonder he speaks so highly of American flour.

In England, stationary wire cylinders with revolving brushes are principally used for bolting, excepting for choice qualities, in which case a seamless cloth drawn on a circular reel, is used. The Dutch bolting cloth is principally used here—the number of meshes being according to the quality of flour required. I do not think the English wheat excels the American. The best white English wheat is raised in the chalk districts in the south, especially near Uxbridge. Soil has more to do with the quality of wheat than climate. The heavy clay lands of England grow a strong red wheat, something like our Indiana red. The fen lands of Lincoln and Cambridgeshire, raise a quality like that of Illinois spring wheat. There is a great difference in what is called "prime Genesee wheat" with ourselves. Most of it is whole Michigan. Oftentimes, indeed, the quality of wheat raised in a district indicates the character of the flour made in it; but millers in many cities can avail themselves of different varieties to produce any quality desired by customers.

I have never seen wheat moistened before grinding (perhaps some eccentric genius has tried it;) we should be sorry to use the watering pot in this State. One cause of American flour souring—more especially that made from western wheat—is owing to its being warm, and immediately packed too hard in the barrels. There are various kinds of driers, but if millers have their stones in proper face, and good bolting apparatus they require no more to make good flour of every quality. I have ground English, Poland, Odessa, Spanish, and French wheat, also every variety of American wheat, except southern, and can say from experience that good flour can be made from them all—some whiter, and others drier, of course. The English millers do not obtain a larger bulk of flour than the American millers, neither do the latter make a better quality, but as it is demanded of them, and contrary to what Dr. Muspratt has said, our bran here will not soil a black coat. * * *

Jackson, Michigan, March 29th, 1855.

(For the Scientific American.)

Proving of the Gravitation Theory.

The moon is 240,000 miles distant from the earth, and 95,000,000 miles distant from the sun. Each has an attractive influence over her proportional to the squares of their distances, and to their relative masses. As the square of 95,000,000 miles is to the square of 240,000 miles, so is the mass of the sun at his distance to the mass required to balance his attraction at the earth's distance, making the latter about one one hundred and sixty thousandths of the former. The mass of the earth is about one three hundred and fifty thousandth that of the sun—not half so large a one as is necessary.

Then the sun's gravitating influence over the moon is double that of the earth over the same. Suppose the moon to be leaving that point in her orbit where she has the earth between her and the sun. She cannot but obey that double attraction, and therefore will, instead of curving downward and backward behind the earth, go forward, taking an orbit of her own round the sun, just as if there were no earth. This orbit will be as far outside of that of the earth, as the moon is distant from the earth, namely, 240,000 miles, making its circumference 598,000,000 miles, 1,000,000 miles more than the circumference of the earth's orbit. To the velocity which the moon has with the earth in their united course round the sun—1,632,000 miles per day—she adds that of her passage round the earth—53,000 miles per day—so that her period of revolution in her new (annual) orbit will be 355 days, 10 days shorter than the earth's period.

Will the gravitationists attempt to falsify my deduction from their premises? Let them attempt. G. W. EVELETH.

Iodine.

Iodine derives its name from *iodos*, a Greek word signifying "violet-colored;" but the transcendant beauty of the color of its vapor requires further elucidation than simply saying that it has a "violet hue." If a little iodine be placed on a hot tile, it rises into a magnificent dense vapor, fit for the last scene of a theatrical representation. This remarkable substance was discovered by accident about forty years ago. At that period chemical philosophy was in great repute, owing principally to the brilliant discoveries of Sir Humphrey Davy. So singular a substance as iodine was to Davy a source of infinite pleasure. He studied its nature and properties with the fondness and zeal of a child at a puzzle map. His great aim was to prove its compound nature; but in this he failed; and to this day it is believed to be one of the primitive "elements," of the world we live in. Iodine is found in almost every natural substance with which we are acquainted, although in very minute portions. The sea furnishes an almost inexhaustible supply of iodine. All the fish, the shells, the sponges, and weeds of the ocean yield it in passing through the chemical sieve. Whatever be the food of sea-weeds, it is certain that iodine forms a portion of their daily banquet; and to these beautiful plants we turn when iodine is to be manufactured for commercial purposes. The weeds cast up by the boiling surf upon the desolate shores of the sea islands would at first sight appear among the most useless things in the world, but they are not; their mission is fulfilled; they have drawn the iodine from the briny wave, and are ready to yield it up for the benefit and happiness of man. The inhabitants of the Tyrol are subject to a very painful disease, called goitre or cretinism; for this malady iodine is a perfect cure. Go, and have your portrait painted "as you are." Photography tells the whole truth without flattery; and the colors used in the process are only silver and iodine.

SEPTIMUS PIESSE.

London.

About Mosquitoes.

MESSRS. EDITORS—You are doubtless well aware that the mosquito proceeds from the animalculæ commonly termed the "wiggle-tail." I took a bowl of clean water and set it in the sun; in a few days some half dozen "wiggle-tails" were visible, these continued to increase in size, till they were about 3-16 of an inch in length. As they approached their maturity they remained longer at the surface, seeming to live in the two mediums air and water; finally, they assumed a chrysalis form, and by an increased specific gravity, sank to the bottom of the bowl. Here, in a few hours, I perceived short black furze or hair growing out on every side of each until it assumed the form of a minute caterpillar. And thus its specific gravity being counteracted, or lightened, it readily floated to the surface, and the slightest breath of air wafted it against the side of the bowl. In a very brief space of time afterwards, the warm atmosphere hatched out the fly, and it escaped, leaving its tiny house upon the water. How beautiful, yet how simple!

After the water had gone through this process, I found it perfectly free from animalculæ. I therefore came to the conclusion that this "wiggle-tail" is a species of the shark, who, having devoured whole tribes of nameless animalculæ, takes to himself wings and escapes into a different medium, to torture mankind, and deposit eggs upon the waters to produce other "wiggle-tails," who in turn produce other mosquitoes. PACIFIC.

San Francisco, Cal., Feb. 25, 1855.

A Bad Habit.

MESSRS. EDITORS:—Permit me, through the columns of your widely circulated paper, to address mechanics on a practice which is often the source of great annoyance, and sometimes productive of great injury to that much injured class—inventors. The habit to which I refer is, that when an inventor goes to a mechanic to get something connected with his invention constructed, he is often plied with questions, such as "what is this for," &c. These are often rendered very disagreeable, by the pertinacity with which they are urged.

Such questions, if prompted by a laudable curiosity and desire for information, would not be objectionable, but information obtained in this way is soon spread abroad, and everybody soon knows as much about the invention as the inventor himself. CATO.

Salem, Mass., March 23, 1855.

An Excellent Paste for Envelopes.

Mix in equal quantities gum (substitute dextraie) and water in a phial, place it near a stove or on a furnace register, and stir or shake it well, it will soon dissolve, and is then fit for use. A little alcohol added after it is well mixed, will prevent its becoming sour, and keep it for any length of time. This is better and much cheaper than any of the gums used for labels or envelopes, and does not crack. T. J. W.

Ambrotypes.

The Worcester, (Mass.,) *Transcript*, thus describes photographic pictures on glass, taken in that city, by Messrs. Hathaway:—

"The picture is taken upon a piece of fine plate glass. Of course the very finest is used, which is free from all imperfection or blemish. Two of these plates sealed together, constitute the picture, although the impression is taken upon but one. In preparing the plate for the camera, it is covered with collodium (gun cotton dissolved in sulphuric ether) and then immersed in a bath of nitrate of silver. By the latter process, the plate is completely silvered. When it comes from the camera, it is exposed to the action of another chemical preparation, and to a bath of sulphuret of iron. Then it is washed with water, and with a preparation of hyposulphite of soda, which, as it were, fixes the picture, and gives it a fast color. After this, it is gilded, which darkens the picture, and it then is the perfect, life-like portrait. There is not about the ambrotype the glare of the daguerreotype, and it has a greater softness and finish.

"The inventor of the ambrotype is James A. Cutting, of Boston, an indefatigable and patient experimenter. We believe he has already sold the exclusive right to make the ambrotype in Springfield, Hartford, New Haven, Chicago, Nantucket, &c., &c. The Messrs. Hathaway have the right for Worcester, Springfield, Edgartown, and Nantucket."

[Our readers will perceive that this is the same process as that described in the SCIENTIFIC AMERICAN, two weeks ago, page 210, when it was stated to be the discovery of a Mr. Archer, in London, in 1851, and this was proven at the trial of law there recorded. If Mr. Cutting, of Boston, is the original inventor, Mr. Archer, of London, cannot be so at the same time, and *vice versa*.

The Mormons are about to build a steamboat for Salt Lake.

New Inventions.

Machine for Planting Potatoes.

The annexed engravings are views of a machine for planting potatoes, for which a patent of the United States was granted to Alexander Anderson, on the 2nd of January last.

Figure 1 is a vertical longitudinal section through the middle of the machine, and figure 2 is a perspective view. Similar letters refer to like parts.

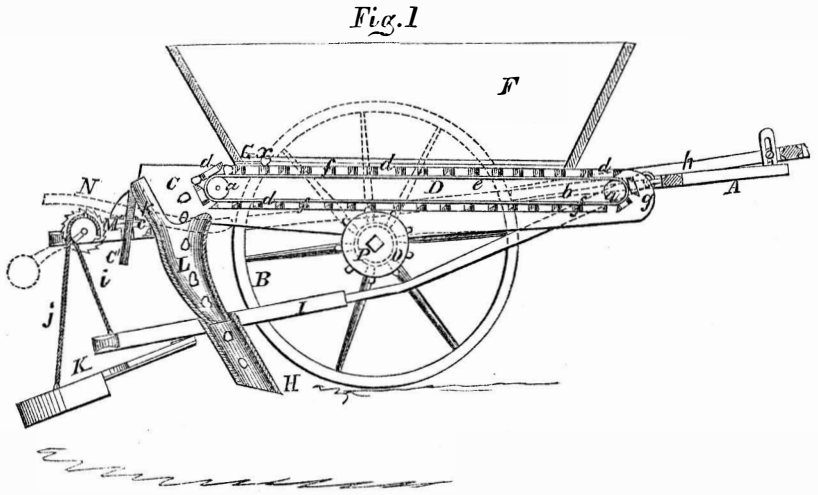
This invention consists in the employment or use of an endless apron, placed underneath, or at the bottom of a hopper, and provided with a series of apertures, which will be hereafter fully described, said apertures receiving the potatoes of a suitable size for seed, and conveying them to the discharge spout, through which they fall into the furrow at equal distances apart, said apertures also conveying potatoes that are too large for seed, to a knife at the bottom of the hopper, by which they are cut of a suitable size for planting. The apertures in the underside of the apron receive the teeth of a wheel by which motion is communicated to the apron.

A represents a rectangular frame supported upon two wheels, B B; and C C are two cheek pieces, between which an endless apron, D, is placed, said apron passing around rollers, *a a*, at the front and back ends of the cheek pieces. The front parts of the cheek pieces rest upon a rod, *b*, which passes transversely through the frame, A, and cheek pieces, about midway between their upper and lower surfaces, said rod also attaching the shafts, E E, to the frame, A. The lower surfaces of the back ends of the cheek pieces rest upon a cross piece, *c*, of the frame, and the cheek pieces and endless apron have an inclined position; C′ is a rod having a screw thread cut on its upper end. This rod fits in a plate, *k*, on the ends of the cheek pieces, and the rod projects downwards a suitable distance below the cross piece, *c*. The endless apron, D, is composed of a series of rectangular blocks, *d*, the lower surfaces of which are attached in any proper manner to a belt, *e*; the edges of the several blocks being in contact, except when passing around the rollers, *a a*, between each two of the blocks, a circular aperture, *f*, is made, one-half of the aperture being in the edge of each block, consequently each block of the apron has a semi-circular recess in two of its edges, and these recesses, when the blocks are attached to the belt, *e*, form the circular apertures, *f*. F is a hopper secured to the upper surfaces of the cheek pieces, C C, and directly over the endless apron, D; G is a knife placed at the bottom of the hopper at its upper or elevated end, said knife passing across the hopper, and just above endless apron, D. H is the furrow share, which is formed of a tube having its lower end cut obliquely so as to form a point to enter the ground. The furrow share is secured to a frame, I, the front part of which is secured by eyes, *g g*, which pass through the ends of the frame, I, and into a cross piece, *h*, of the frame, A. The back part of the frame, I, is attached by a chain, I, to a roller, J, on the back part of the frame. K is the covering share which is attached by a hinge or joint to the back end of the frame, I; a chain, *j*, connects the covering share with the roller, I; L is a discharge spout, the upper end of which is placed directly under the elevated and discharge end of the endless apron, D. The spout, L, conveys the potatoes into the tube of the furrow share; M is a ratchet on one end of the roller, J, and N is a pawl attached to the frame, said pawl catching into the teeth of the ratchet; O is a toothed wheel on the axle, P, of the wheels, B B. The teeth of this wheel fit in the apertures, *f*, in the endless apron, D.

Operation—The hopper, F, is filled with potatoes, and as the machine is drawn along, motion is given the endless apron, D, by means of the toothed wheel, O, gearing in the apertures, *f*, in the underside of the endless apron. Potatoes of a suitable size for planting will fall into the apertures, *f*, and will pass under the knife, G, and be thrown into the discharge spout, L, as the blocks, *d*, pass around the roller, *a*, at the upper or elevated end of the apron, the apertures being widened as the blocks pass around the roller in consequence of the edges of the blocks being forced apart. Potatoes that are too large for planting will project upward above the surfaces of the blocks, *d*, and will be cut by the knife, G; the top portion that is cut off will, if small enough, enter one of the apertures, *f*, and be

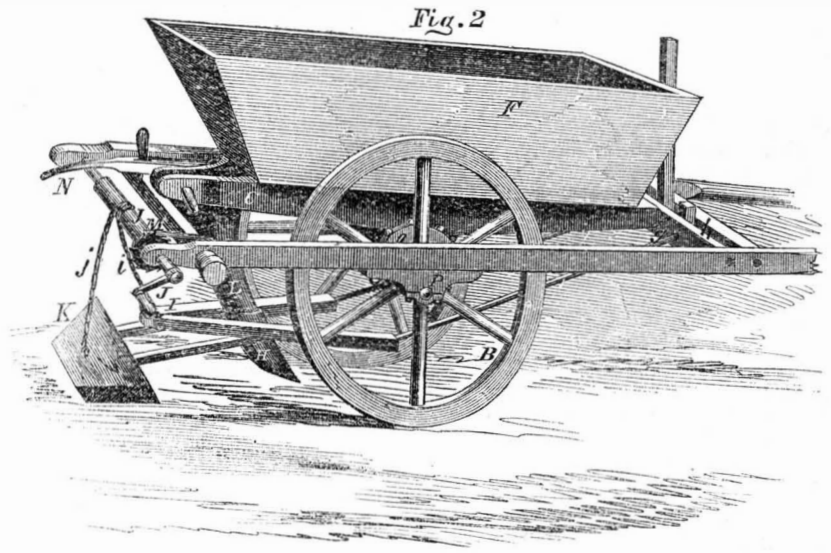
POTATO PLANTING MACHINE.

Fig. 1



discharged into the spout, L. If not made small enough at one cutting, it will be again cut when brought to the knife, the pieces of the potato remaining in the apertures are of course discharged as the blocks pass around the roller, *a*. The potatoes drop into a furrow made by the share, H, and they will be dropped at equal distances apart, the distance between the potatoes being regulated by the size of the wheel, O. The larger the wheel, O, the nearer the potatoes will be planted, and one or more extra wheels of different sizes may be placed in the shaft, P, and put in gear with the apron, as occasion may require. The furrow and covering shares, H K, are raised from the ground by turning the roller, J. As the chain, *i j*, are wound around the roller, J, the frame, I, is raised and will act against the lower end of the rod, C′, and raise the cheek pieces, C C, and endless apron, D, and the endless apron will be thrown out of gear with the wheel, O. The roller, J, being prevented from moving casually by means of the pawl, N, and ratchet, M. Thus by this machine the potatoes will be cut the required size, and planted at equal distances apart in the furrow. There is no uncertainty attending the operation. The machine is simple, not liable to get out of repair, and is economical to manufacture.

Fig. 2



More information may be obtained by letter addressed to Salem Eckarett, assignee, Unionville Post Office, Markham, Canada West.

IMPROVED RATCHET WRENCH.

Fig. 1

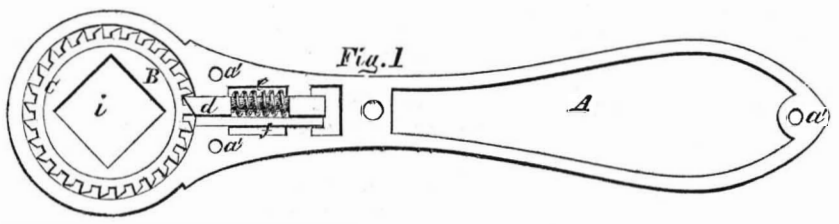


Fig. 2

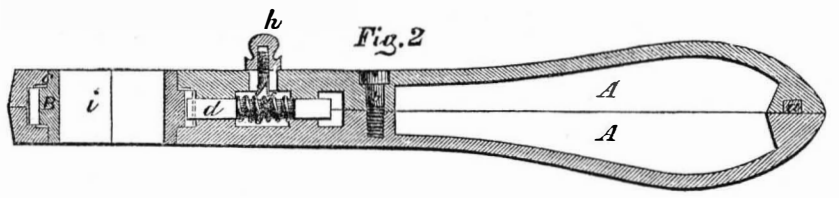


Figure 1 represents an interior view, (one-half being removed) and figure 2 a section of an improvement in ratchet wrenches, for which a patent was granted to Charles G. Everitt, of the city of Brooklyn, N. Y., on the 9th of January last. Similar letters refer to like parts.

This invention consists in the employment of a stop, and of properly formed ratchet teeth, to enable the ratchet to be stopped for the purpose of making the wrench operate both ways, when desired, for the purpose of working a tap back and forth for tapping screw holes, and as expeditiously setting it free when it is desired to enter the tap further.

The head, neck, and tail, or the whole exterior of the wrench is divided longitudinally in two equal parts, A and A′. These parts are cast separate, and fitted together with steady pins, *a*, in one entering holes, *a′*, in the other, and secured together by screw, *b*. In the head of the wrench there is a cavity to receive the ratchet, B, which contains the eye, *i*, of the wrench, half of the said cavity being in the part, A, and half in the part, A′, and outside of this cavity the head is bored truly, to receive the journals, *c c*, which are turned on the hub of the ratchet. The pawl, *d*, which engages with the ratchet, B, is fitted to slide rectilinearally in the neck of the wrench, being made square to prevent its turning; and suitable cavities are provided in A A′, to receive the spiral spring, *e*, which surrounds and acts upon the pawl, to make it engage with the ratchet. Side by side with the pawl, *d*, is placed a stop, *f*, which is a flat straight piece of steel or iron of a width equal to the pawl, so as to slide in the same grooves in A A′. To one side of the pawl is attached a screw, *g*, which passes through a slot in the part, A, and is fitted with a nut, *h*, outside. By taking hold of this nut, which is formed like a knob, the stop may be slid in or out of gear with the ratchet, and by screwing up the nut it may be fixed in either position. The point of the stop is made square, and the ratchet formed with square-bottomed notches, in order that when the stop is in gear it may hold the ratchet effectively. The handle or tail part of the wrench is made hollow by providing large cavities in A A′. The wrench will work in either direction according as one or other side is uppermost.

More information may be obtained by letter addressed to Mr. Everitt, No. 36 Gold street, New York City.

Railroad Station Directory.

I. S. Richardson, of Boston, patentee of the atmospheric tubular railway, has invented a very simple, neat, and effective method of informing passengers in railway cars of every succeeding station they are to arrive at, and its distance from the past one. It consists of a small neat frame like a clock face, in which there is an endless broad ribbon, on which is printed the names of the stations, and the distance in miles from the past to the next. There is a small window in the frame, like the open space of a hotel annunciator, in which the names of stations successively appear prominent to all the passengers. This directory is hung on the end of the car inside, and when one station is passed, the conductor, as he passes through the train, turns a small handle, which rings a bell, and makes the name of the next station, and its distance, walk forward and look out of its window into the face of all the passengers. The invention is useful, cheap, and practical, and should at once be adopted by all our railroads.

Steam Engine Governor.

The patent granted this week to Wm. H. Elliott, of Plattsburgh, N. Y., for an improvement in governors for steam engines or other motors, embraces the governing of the speed of the motor by the resistance of the machinery, and not like the common governor, by the varying velocity consequent upon the variations in the power and resistance. It can be used in combination with a common governor upon a throttle valve (which controls the supply of steam;) it being made to govern by the resistance of the machinery driven, and the common governor by the velocity of the engine, so that variations in the resistance consequent upon the throwing in or out of gear of any part of the machinery, and variations in the power consequent upon the increase or diminution of pressure of the steam, may be compensated for, independently of one another, and the engine (or a water wheel) may be governed in a more perfect manner than by governors in common use.

Operating Valves of Direct-Acting Steam Engines.

The claims on another page, of the patent granted to Wm. H. Guild, and Wm. F. Garrison, of Brooklyn, N. Y., embraces a simple means whereby the valve is caused, as the stroke of the piston terminates in either direction, to have the necessary movement suddenly imparted to it, to effect the return of the piston, the same means also serving to relieve the valve of all unnecessary pressure and friction upon its seat.

Scientific American.

NEW YORK, APRIL 7, 1855.

Steam versus Ether.

We sometimes receive communications expressing dissent to opinions we have presented, simply, because some works and some professors whom these correspondents have looked up to as first authority, have presented opinions and made statements contrary to our own. We received a letter from a correspondent last week, expressing his dissent from the opinions we expressed on page 214, respecting the use of ether vapor as an economical agent in propelling machinery, in comparison with steam.

"You have scarcely devoted" he says, "sufficient thought to the subject, else you would have perceived that the density of the vapor (that is, the density of ether vapor in comparison with steam,) could have very little bearing upon the question, beyond the variation in the proportion between the volume of the vapor and that of the liquid from whence it is derived." He then quotes an article from Silliman's *Journal*, November, 1854, which states, that in an experiment with Du Tremblay's boat, by steam alone, 9·51 lbs. of coal per horse power were consumed per hour; while with steam and ether, only 2·24 lbs. of coal were used per hour for each horse power. We must say, that we have not the least confidence in such a statement. The gain stated to have been obtained by Du Tremblay's engine, is simply by the use of ether in a separate cylinder expanded into vapor by the exhaust steam. But how this exhaust steam applied to the ether effected such a gain—more than quadruple the amount of steam alone (9·51÷2·24=4·25)—we are not informed.

Our correspondent, in order to enlighten us further, quotes an article of Prof. Apjohn's, on the economy of ether over steam, taken from the *Chemical Gazette*, Oct. 5th, 1852. Instead of not having, as our correspondent supposes, *devoted sufficient thought to this subject*, we criticised that very article on page 117, Vol. 9, Scientific American, and showed that Prof. A. did not know what he was writing about. The following is the concluding part of our correspondent's letter:—"The data most to be relied on are, water—specific heat=1·00; latent heat of steam 961·8, boiling point 212°; ether, specific heat 0·50, latent heat 163·8, boiling point 100·4°, hence, by calculation, we find the caloric necessary for formation of a volume of the vapor of water is 1129°, that of ether 534·7°. That is with ether somewhat less than one half required for water. To its practical use, however, there are obvious objections, such as its cost, inflammable character, difficulty of surface condensation, &c., which exclude it from its possible usefulness." M. P.

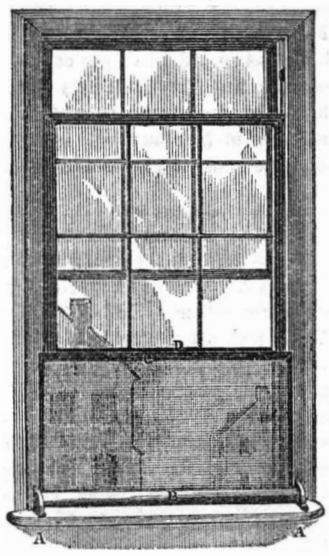
Our correspondent is right in his last sentence, respecting its practical application, but he is wrong in all that precedes it. Allowing him to be correct in his statement, wherein he alleges that a little less than one half the heat only is required for ether vapor in comparison with water vapor, he ought to have seen how untrustworthy the statement in Silliman's *Journal* is, which makes the gain twice as much as he does.

Our correspondent must dip a little deeper in chemistry than he seems to have done in taking Prof. Apjohn's reviews for his guide, before he can enlighten our readers on this subject. We must tell both him and Prof. A., that equal volumes of the vapor of ether and water (steam,) contain equal amounts of heat—there is not the difference, as he states, of 1129°÷534·7° in equal volumes, though there may be in *a volume*, but the distinction between the two is as great as cheese and chalk. Graham (far better authority than Apjohn) says, "the same bulk of vapor will be produced from all liquids with the same expenditure of heat; hence there can be no advantage in substituting any other liquid for water, as a source of vapor in the steam engine." Why did Graham come to this conclusion? Simply because an equal weight of water and ether do not produce an equal bulk of vapor. Our correspondent and Professor Apjohn repudiate a *unit* or proper base of measurement, hence they have come to as sensible conclusions as the man who estimated, that of two men, one was head and shoulders taller than the other, because he was standing on a bench, while the other stood on the ground.

If we take 10 lbs. of water and convert it into steam, we find it will occupy a space of 1728 times its former bulk, with an expenditure of 1184° of heat. Now, if we take 10 lbs. of ether, we find that it can be converted into vapor with only an expenditure of 258° of heat. "A vast saving," Prof. A. will say. but this is not so, for this vapor having just six times less the elastic force of the steam, will only occupy a space of 288 times its former bulk, for it is six times denser than steam. It will, therefore require 60 lbs. of ether converted into vapor to do the same work of 10 lbs. of water converted into steam. "Equal volumes of vapors possess equal quantities of latent heat." The latent heat of ether vapor is 162°, that of steam 972° therefore a gallon of steam and a gallon of ether vapor, of the same pressure, contain 972° of latent heat. The specific gravity of vapors is in proportion to their latent heat, therefore [s. 972÷e.162=6] the vapor of ether is six times heavier than steam. But it may be said, "the boiling point of steam is 212°, that of ether 96°, therefore there must be a gain of 116° in the use of ether." If we reasoned like our correspondent and Prof. Apjohn, we would, indeed, come to such a conclusion; but be it remembered, that it takes six times the quantity of ether to produce the same amount of vapor as water, therefore it requires more heat to use ether vapor than water vapor as a motive agent. Ether boiling point 96°+latent heat 162°=258×g.6=h.1548°=or 364° more than steam. These figures are very different from those of our correspondent. There are others besides him who have been equally deluded by trusting to unlearned Professors and unsubstantial authorities respecting the economy of the vapors of ether, alcohol, &c., as substitutes for steam. The foregoing, we trust, will cause the scales to drop from their eyes.

Mosquito Window Screen.

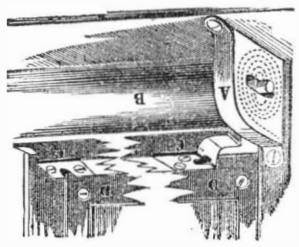
Fig. 1.



The annexed figures represent an improvement in window screens for excluding musquitoes and flies in summer, when a portion of the window is left open for proper ventilation. The inventor is B. B. Webster, of Boston; a patent was granted for the improvement on the 4th of last October.

Fig. 1 is an inside view of a window having the improved mosquito curtain attached—the lower sash being partly elevated, in order to exhibit the curtain. B is a roller (moved by a spring in boxes, A A,) around which the gauze curtain is wound when the window is closed. The spring is indicated by the dotted lines in fig. 2 (a perspective sectional view) at A. C is a movable bar that may be easily detached from the sash, D, to allow the window to be easily opened, when desired, without using the curtain. C C, fig. 2, shows this bar detached. When the window is partly open, the space between the glass and the bottom of the upper sash is effectually closed by some flexible material, to prevent insects from entering the room in that way. A like insect curtain may be applied to the upper sash, if desired The common mosquito curtains are fixed to a separate frame made for the lower sash of windows, which has to be removed, and the curtain frame set in. This invention is certainly a neat and convenient improvement over the common kind. This curtain has only its

Fig. 2.



small spring and roller box, B, secured to the window sole by screws, and the bar, C, to which the upper end of the curtain is attached, clasped upon the lower part, D, of the sash, so that when the window is raised, as shown in fig. 1, the curtain is drawn up and covers the space, to prevent the ingress of insects. When the window is lowered, the springs in the roller box wind the curtain by self-action on the roller, B. The tension of the springs can be regulated in a minute, to suit any window to which a curtain is attached.

More information may be obtained by letter addressed to Mr. Webster, at No. 9 Blackstone street, Boston.

Progress of the Telegraph.

The last number of the *North British Review* contains an able article on the "Electric Telegraph," in which the claims of several inventors are criticised. It gives the credit of suggesting the first electric telegraph, and publishing a description of it, to a correspondent of the Scott's *Mechanics Magazine*, as far back as February, 1753, more than a hundred years since. This communication no doubt describes a working telegraph, the power being frictional electricity, for the voltaic battery was not discovered for fifty years afterwards. For public purposes, this old telegraph could not be used, but it is certainly a scientific curiosity.

The merit of inventing the modern electric telegraph, and applying it on a grand scale, for public use, is awarded, "beyond all controversy," to Prof. Morse, and the reviewer seems to make this award in a most candid manner. He says, "while men high in office, and even men of science on both sides of the *Atlantic*, entertained doubts of the applicability and practical use of the telegraph, Prof. Morse was actively engaged in pressing the importance of his invention on the attention of Congress, and though only half convinced by his earnestness and demonstrations, the Federal Legislature appropriated a sum of money for the construction of a telegraph forty miles in length, between Washington and Baltimore. This may be considered the parent telegraph of the trans-atlantic world, from which a system has sprung, which, in its extent and achievements, is well calculated to fill both native and foreigner with astonishment."

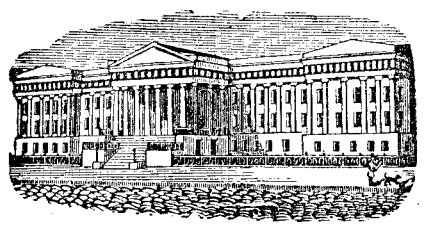
The credit of inventing and constructing the most rapid working telegraph is given to Alex. Bain. This machine was illustrated on page 273, Vol. 3, Scientific American.—Respecting it, Dr. Lardner says: "The system of Bain is to the common telegraph what the steam engine is to the horse—the power of the hand loom or the stocking frame to the knitting needle." The *Review* seems to anticipate a time when the Post Office will give place to the telegraph, and that the former will only be employed for sending heavy orders. "When the sixpenny or penny telegraph comes into play," it says, "Mr. Bain will stand forth as the greatest of telegraph inventors." It makes this assertion upon the authority of Dr. Lardner, who states, that 20,000 words can be sent in one hour, by one wire, on the chemical telegraph, and to a greater distance than by the magnetic telegraph.

We have always been given to understand that the whole credit of inventing, erecting, and introducing the telegraph in England was due to Professor Wheatstone, of London; all the historical accounts of the telegraph award him that honor. But it now comes out that such credit is more justly due to W. F. Cooke, his partner, who has been unjustly robbed of such credit through the connivance of the friends of Prof. W.

We learn that the Morse telegraph is used in Prussia, but not in England, the signal telegraph being the one principally used there. Switzerland is at present that country of Europe which possesses the most complete net of telegraphs. There is a telegraph office there for every 25,000 inhabitants, in England one for every 56,060 inhabitants, in Sardinia for every 70,000, in Belgium for every 130,000, in France for 290,000, in Prussia for 320,000. The moderate single tax of one franc for a despatch of twenty-five words in the whole territory of the Swiss Union, has thus far found a complete imitation in no other land. No less than 37,000 miles of telegraph wires extend through Britain and Ireland. Our American lines are estimated at 41,392, but the wires, we suppose, are more than double this length. Distant Hindostan now bears testimony to the sway of the telegraph. A line was opened on the 1st of last month (February) between Bombay, Madras, and Calcutta, embracing a distance of more than 2000 miles. It is to be carried through Egypt, and will soon be in communication with the European lines, so that messages will then be transmitted from London to ancient India in a few seconds. The telegraph is one of those inventions which tends to change the social conditions of society, and the habits of mankind. Its power and influence are now felt in every department of life. The press, the mercantile world, and the administrators of law and justice rely upon it daily for the most important information. When we recollect that ten years ago there were only thirty miles of telegraph lines in our country, and that now there are a thousand times thirty miles in operation, we have no hesitation in asserting that we firmly believe the whole earth—through ocean and overland—in ten years more, will be girdled with the lightning rail, and man will communicate with his fellow man, in a few minutes, from the most distant portions of the globe.

Testing Lubricating Oils.

H. L. Kendall & Co., of Providence, R. I., have a delicate machine for testing oils, &c., both as it regards their anti-friction qualities, and durability when applied to lubricate machinery. All those who have patent and improved oils for such purposes, and wishing to have them tested, can have this done by sending samples to Mr. Kendall. This will confer a favor upon us, and upon all our railroad superintendents, and manufacturers, as Mr. Kendall will make a report, through the columns of the Scientific American, of his experiments, and thus spread abroad, throughout the length and breadth of our land, a particular kind of information of the most important character. The subject of lubricating oils is becoming of more importance every day. We do not know how much is expended every year for oils on our railroads alone, but it must amount to an enormous sum. And when we take into consideration the number of steamships, steamboats, woolen and cotton factories, saw mills, printing presses, and all the other machines in our country, which consume oil, for lubrication, we should not be surprised if the sum total amounted to five millions of dollars annually. If any saving can be effected by a knowledge of what is the most economical lubricating material, a great good will be accomplished. The price, anti-friction, and durable qualities of each oil will form the data of comparison, and the *unit* of the tests will be the best quality of sperm oil. We hope and trust that great benefits will result from this notice. Those who send samples of oils to Mr. Kendall will be pleased to pay the expense of transport, as his labors are to be given without fee or reward.



[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING MARCH 28, 1855.

ROTARY PUMP—Abel Barker, of Honesdale, Pa. : I claim causing the buckets, c c c, during a portion of their revolution, to pass through an enclosed channel, k, and during the remainder of their revolution to pass through the chamber which communicates directly with the central induction opening, f, substantially in the manner and for the purpose set forth.

CLAMP AND MOUTHPIECE FOR LUMBER JOINTING MACHINES—C. F. Bauersfeld, of Cincinnati, Ohio: I claim, first, two or more clamps so arranged, and connected as described, as to be simultaneously and equally applied to or withdrawn from the different parts of a portion of furniture to be jointed by the means of a single handle.

Second, the parallel motion fixed in any desired position by means of the bridle and screw, as described.

PREPARING WOOLEN ROVING—A. E. Bigelow, of Chicopee, Mass. : Having thus described the nature of my invention, and the reasons for the mode of operation which I have invented, together with the mode of construction which I have tried with success and deem the best, I wish it to be distinctly understood that I do not limit myself to such special mode of construction, as the same mode of operation may be obtained by the mere substitution of equivalent means.

But I claim the mode of operation specified, of spinning woolen yarns from previously twisted roving between two sets of draw rollers, substantially as specified, in combination with the subsequent twisting in the same direction by ring groove travelers, flyers, or other equivalent devices, substantially as specified.

SPINNING WOOL—A. E. Bigelow, of Chicopee, Mass : Although I have described the use of flyers for twisting and winding on the rovings, I do not wish to limit myself to the use of flyers in the practical application of my said invention, as any of the known equivalents for the flyer or any improvement thereof which might be hereafter made, may be substituted for this one element of the combination.

But I claim in the preparation of woolen roving the combination of flyers, or the equivalent thereof, and their appendages with the ring doffer or doffers of a carding machine, by the interposition of a pair or pairs of rollers, substantially as specified, to deliver the slivers from the doffer or doffers, that they may be regularly twisted and wound on without drawing, as specified.

MACHINES FOR TURNING THE LIPS OF AUGERS—Ransom Cook, of Shelburne Falls, Mass. : I do not claim any of the several and separate parts of the machine described except the wrench.

But I claim the combination of the screw shaft, or its equivalent, with the wrench, and crimping or clamping dies, as substantially set forth and for the purpose mentioned.

I also claim the shape of the wrench, substantially as described, for the purpose of turning the lips of boring implements.

GRAIN AND GRASS HARVESTERS—Andrew Dietz, and J. G. Dunham, of Raritan, N. J. Ante-dated Jan. 2, 1855: We claim, first, constructing the cams, C and D, upon driving wheel A, of a length exactly corresponding to the cutting range of a single stroke of the knife during the advance and return of the cutter bar, substantially as and for the purpose set forth.

Second, the difference in the relative depths of the cams, C and D, in combination with the linked levers, B and V, arranged and operating substantially as set forth.

Third, arranging the highest elevation of each cam upon the wheel A, at a point between the highest elevation and lowest depression of a cam upon the other side of the wheel, substantially as set forth.

PROCESSES FOR REFINING JEWELLERS' SCRAPS—Levi B. Darling, of Providence, R. I. : I claim the processes described of separating and recovering the gold and silver from goldsmiths' and jewellers' scraps, such as turnings, sweepings, cuttings, filings, which contain both noble and base metals, that is, by melting down the metallic compounds, then stirring in gradually the niter, and working the mass without fluxing, then washing with water and treating with sulphuric acid to convert the oxydized products into sulphates, in the manner described.

[This is one of the most valuable inventions which has been patented under the chemical class for a long time.]

COMBINATION OF SPEED AND RESISTANCE GOVERNORS.—W. H. Elliot, of Plattsburgh, N. Y. : I do not claim a centrifugal governor, or a resistance governor, when used separately, as I am aware that a governor of the latter character was patented by W. Gardner, June 10th 1851.

But I claim the combination of a speed governor with a resistance governor, in such a manner that each shall exert its own proper effect upon the motive power, producing thereby a compound resultant regulation, without either of the said governors interfering with the action of the other, as set forth.

[See notice of this invention on another page.]

CHAIRS—L. W. Ferris, of Owego, N. Y. : I do not claim a chair wherein the parallelism of the back and foot rest rails is maintained by the arms and seat.

But I claim hinging the seat, at its back, to the back of the chair only in combination with hinging the rails of the foot rest to the lower end of the pieces forming the back so that the seat shall partake of the inclination of the back and foot rest rails, and said foot rest rails move on a changing center, as set forth.

MODE OF SUPPORTING TABLE LEAVES—H. A. Frost, of Worcester, Mass. : I do not claim the idea of using a brace to support table leaves, as such.

But I claim the application to table leaves of a self acting swing brace or support, which shall operate by its own weight, when the leaves are raised, substantially as set forth.

CULTIVATORS - H. D. Ganse, of Freehold, N. J. : I claim, first, that shape of the upright parts or fenders described, in its application to the purposes described, by which the fore most point of each fender is elevated to or above the surface of the ground, and the lower or cutting edge inclines backward from that point, in the manner described, so as to secure the result described.

Second, the combination of said fenders with the mold boards and wheels in the manner described, the invention of which mold boards and wheels I do not claim.

SCREW WRENCHES—L. D. Gilman, of Troy, N. Y. : I make no claim to the teeth on the sliding bar of the wrench. But I claim the arrangement of the adjustable toothed plate with its springs, the toothed shank of the adjustable jaw, and the eccentric with its strap attached to the toothed plate, the several parts being operated in the manner as described and shown.

PACKING JOURNAL BOXES—Warner Groat, of Troy, N. Y. : I claim the combination and arrangement of the packings, ring and apparatus for tightening the same within the box, substantially as described, so that the packing in the inner end of the box can be tightened at the end, and the box be kept oil tight without being pierced with holes, as specified.

OPERATING VALVES IN DIRECT-ACTING STEAM ENGINES.—W. H. Guild & W. F, Garrison, of Brooklyn, N. Y. : We do not confine ourselves to the particular form of the valve or arrangement of the ports further than is necessary to the within described operation.

We claim giving to the valve the whole or part of the movement necessary to effect the change in the direction of the engine piston by means of the steam acting upon a piston, B, which is arranged and applied to work perpendicularly to the valve within a cylinder, D, attached to a cap fitted to the back of the valve, and is supported against the pressure of the steam by a rocker, e, or its equivalent, by which it is caused to operate substantially as set forth.

[See a description of this invention on another page.]

LOOMS—David S. Harris, of Coventry, Rhode Island: I do not claim the shuttle guard, as I am aware that shuttle guards, substantially similar to that I have shown have been employed, attached fixedly to the lay, or if movable, requiring to be moved by hand, and I do not confine myself to the use of a shuttle guard constructed precisely like that described.

But I claim the conuectlon of the shuttle guard in any way substantially as described, with the belt shipper, in such a manner that when the loom is in gear the guard may stand over the shuttle race in such a way as to prevent the shuttle flying out of the loom, but when the loom is out of gear, the guard may be raised out of the way of the attendant to enable threads to be picked out or drawn through the reed, or such other manipulations to be performed as may be necessary.

[On another page may be found a notice of this valuable improvement in Looms.]

FIRE PROOF SAFES—R. G. Holmes & W. H. Butler, of New York City : We are aware that a compound of alum and clay has been used as a fire-proof filling for safes: also that brick, soft stone, layers of pumice and other porous substances have been used for an interior fire proof lining or shield for the like purpose; likewise that, in connection with various soft porous fillings between the inner and outer cases of the safe, tubes containing alkaline solutions have been interspersed; none of such therefore do we claim, nor yet, as a more antiphlogistic compound, the combination of an alkali with alum.

But we claim a new and useful improvement in alum fillings of safes or other fire-proof structures, essentially as specified, combining with the alum filling an alkali, in such proportions as that the alum in becoming heated or melted, has a part of its acid neutralized by the action of the alkali, when the said filling is interspersed with, and supported or restrained from settling down by cells, a, of porous material, or frame work of porous substance arranged substantially as described.

[This invention is one of importance to safe manufacturers, and the well-known reputation of Messrs. Holmes & Butler, as safe manufacturers will be greatly enhanced by adopting this new filling.]

ILLUMINATING VAULT COVERS—Thaddeus Hyatt, of New York City : I do not wish to be understood as making claim broadly to the securing of glass directly within a soft metal sash, nor to the securing of glass within a metal case to be in turn secured within a metal socket, as these have been known when applied as specified.

I claim the method of securing glasses in the apertures of metal plates or other surfaces by surrounding the glass with a hoop or belt of lead, gutta percha, or other equivalent yielding substance, and forcing the glass so surrounded into the aperture or recess, substantially as and for the purpose specified.

LOOMS—Wm. S. Irish, of Middleburv, O. : I do not claim the harness frame uprights, cams or shoes; but I claim the method of raising the harness to the immediate application of the cams to the shoes or projections of the harness, substantially as set forth.

GRATE BAR—J. S. Kirk & W. H. Elliot, of Plattsburgh, N. Y. : We claim the employment of a suspension rod for the support of the grate bar arranged as described, or its equivalent. The constructing of the wearing and supporting parts, as described separately, so that said wearing parts may readily be removed and replaced for the purposes set forth.

TOOL FOR BORING HUBS TO RECEIVE BOXES—Urias Kimble, of Penfield, N. Y. : I do not claim the shaft, the adjustable knife, or the adjustable gauge, as they have been known before.

I claim the oval-shaped box with the nut with spurs on the under side resting on the oval shaped box in combination with the shaft, the knife, and the gauge, for the purpose set forth.

METHOD OF CHALKING LINES—S. B. Knight, of North Providence, R. I. : I claim the described method of chalking a line by drawing it through the cylinder or other vessel containing the fine chalk, and also through the rubber of leather or other compressible substance for the purpose and in manner substantially as set forth. And this I claim when used for chalk or other coloring material.

SHINGLE MACHINE—Charles Leavitt, of Quincy, Ill. : I claim, first the elastic table, k, capable of being elevated and depressed by the means described or their equivalents, in combination with the froe or splitting knife, h, substantially in the manner set forth and for the purposes specified.

Second, the elastic shingle holder constructed and arranged substantially as described and for the purposes specified.

Third, the jointing knives, d', pivoted to the plane stocks in combination with the bar, a', substantially as described, for the purpose of jointing the edges of the shingles with a drawing cut.

SELF-ADJUSTABLE OR ANCHORING PUMP—Thomas Ling, of Shelby, O. : I claim, first, connecting the piston or stationary part to a weight or anchor by a flexible joint, or its equivalent, so as to allow the anchor to adapt itself to the bottom of the well without cramping the other parts, substantially as described.

Second, connecting the anchor to the cylinder or moving parts by means of the projections and slotted arms, or their equivalents, so as to draw the anchor from the well by means of the pipe and cylinder or moving parts, substantially as described.

Third, I claim the devices, substantially such as are described, or their equivalents, for guiding and steadying the upper end of the pipe, and discharging the water downwards into a box, having an opening in the side in which the pipe traverses closed below the pipe by the plate, F, or its equivalent.

CHARCOAL FURNACES—John McNeill, of New York City : I do not claim a hollow or tubular iron beam, merely as such, as I am aware that hollow beams have been and are commonly used in various structures.

But I claim supporting the retort tubes, B B, by a hollow or tubular beam or beams with open ends applied substantially as described, so that one end of each is in communication with the cold or atmospheric air outside the furnace, and the other with the chimney or escape flue, whereby a current of cold air is caused to be induced through the beam by the draft of the chimney or flue, for the purpose of keeping it comparatively cool, preventing it burning and rendering it a firm and durable support to the retort tubes.

And I also claim constructing the furnace with one or more arched walls, H, extending across it, substantially as described, to support the joints in the beams, G G, when the said beams are made in two or more lengths, and also to support the side walls and roof.

[See a further description of this furnace which is so important to sugar refiners, on another page.]

SEED PLANTERS—Hiram Moore, of Climax, Mich ; I do not claim a grooved seed distributing wheel, nor a seed scattering board individually.

I claim grooved seed distributing wheels, K K, provided at the bottom of the grooves with partitions extending about one third of their depth, in combination with the dash board, H, in the manner and for the purposes set forth.

BILL HOLDER—G. W. Palmer, of Boston, Mass. : I claim an oblong box of suitable size for holding files of bills or papers, having upon one of its sides a hinged movable arm and attached spring, by which the papers are held in place, as fully described.

COFFINS—David Sholl, of Cincinnati, Ohio : I claim the production of a coffin composed of terra cotta or pottery ware.

CURRENT WHEEL—W. S. Smith, of Cedar Rapids, Iowa : I claim the construction of current wheels with heads or hubs movable on the shaft, as and for the purposes set forth

MANUFACTURE OF BOOTS AND SHOES—H. G. Tyer and John Helm, of New Brunswick, N. J. : We disclaim the use or application of this our device or invention to any other matter or thing other than is described and set forth.

We claim the uniting of the outer sole and upper manufactured wholly or in part, of vulcanized india rubber, with the insole of boots and shoes, by means of cement, the cement passing through perforations made for that purpose in the upper, in the manner substantially and for the purposes described.

SEED PLANTERS—Myron Ward, of Owego, N. Y. : I claim the adjustable slotted share for the purpose of removing obstructions, and at the same time allowing the fine earth to pass through the slots, which share is made adjustable by means of a thumb screw and plate in rear.

I also claim the short compressing blocks on the periphery of the wheel, which compressors crowd the earth laterally over the seed, and at the same time indicate the place of the hill, and by which means the grain can be planted in check rows.

CULTIVATORS—R. P. Vanhorn, of Jackson Town, O. : I claim the peculiar elongated rhombus-shaped wrought-iron frame and arrangement of teeth, the front angle bearing a light steel cutter tooth, and the rear angle a large shovel tooth, in the manner and for the purposes set forth.

HULLING COTTON SEEDS—Joseph Walker, of Dover, England. Patented in England, July 20, 1854: I claim supporting and adjusting the concave bed by means of grooves cut within, or other equivalent devices affixed to the side frame, in such manner that the said concave shall be eccentric to the axis of the hulling cylinder, for the purpose specified.

CULTIVATORS FOR SWEET POTATOES—Wm. P. Zane, of Woolwich, N. J. : I claim the vine hooks, f g g, arranged in such a manner in relation to the cultivating teeth, h h h, that the said hooks will remove the vines out of the way of the said cultivating teeth, and allow them to operate upon the soil without injury to the vines, substantially as set forth.

PROCESSES FOR MAKING KEROSENE—Abraham Gesner, of Williamsburgh, N. Y. (assignor to "The Asphalte Mining and Kerosene Gas Co.") : I claim the process described for extracting the liquid hydrocarbons which I have denominated Kerosene, from asphaltum, bitumen, asphaltic, and bituminous rocks and shales, petroleum and maltha, by subjecting any of these substances to dry distillation, rectifying the distillate by treating it with acid and freshly calcined lime, and then submitting it to re-distillation, as set forth.

MANUFACTURE OF ZINC WHITE—Smith Gardner, of New York City (assignor to [through others] Edward Kellogg, of Brooklyn, N. Y.) : I claim the combination of the fire chamber, the vaporizing chamber or oven, and the oxydizing chamber, substantially as described.

ADDITIONAL IMPROVEMENT.

LUBRICATOR—R. M. Wade, of Wadesville, Va. Patented June 6th, 1854 : I claim, first, the division of the plug into two longitudinal chambers, C and D, and the relative positions of the feed and discharge openings in said chambers, so that while one chamber is discharging a simultaneous feed will take place in the other.

Second, disclaiming the tubes, f and f', as mere vent passages I claim their insertion relative to the feed openings of cup and plug, as described, whereby they perform the double function of vent and steam passages: the feed openings of the plugs passing under the tubes and discharging the steam contained in the plug clear of the oil in the cup, before communicating with the feed channel of the cup.

[On page 356, Vol. 9, SCI. AM., this invention may be found illustrated.]

A Substitute for Guano.

The Montreal *Commercial Advertiser* says that a French farmer, by the name of Malon, has discovered a method of converting the offal and refuse parts of fish into a valuable manure, equal in fertilizing power to the best Peruvian guano, and possessing no offensive qualities. He conceived a project of converting these fish into a more compact and convenient kind of fertilizer, and accordingly, after a few trial experiments, embarked in 1851 for Newfoundland and established a large factory at Herpon, in the Straits of Belle-Isle. He associated with himself a partner who established also a similar factory at a little fishing village near Brest, in France. At these factories the refuse fish and offal of all the fishermen in the vicinity were bought. They were first boiled under a pressure of fifty pounds to an inch, and then the pressed cakes were reduced to a pulp by a mechanical rasp, and dried in a hot stove. The material was next ground to powder in a mill, and packed away in bags and barrels for use. One hundred parts of the fresh fish yielded twenty-two of fish powder, and is eagerly purchased by the farmers. From the water in which the fish is boiled, about two and a-half per cent. of oil is skimmed. The French factory produces some fifteen hundred tuns a year of fish manure, and that of Newfoundland is expected to produce annually eight or ten thousand tuns.

A Great German Skeleton.

The famous fossil skeleton of the zeuglodon, found in Alabama some fourteen years ago by a German named Koch, exhibited in New York, and afterwards sold to a Dr. McDowell at St. Louis, was lately taken for debt, and in process of removal fell to pieces, and many of the bones were broken, when the wonderful monster was found to be of genuine plaster of Paris formation, and of entirely German origin, being connected with the primeval epochs only by the raw material.—[Exchange.

[Barnum couldn't perform such a feat as this.

Give employment to the poor man whenever you have an opportunity. By so doing, you will often save a fellow being from want—from the pang of returning, without bread, to his house. You will encourage him to be honest and industrious—add to the comfort of his family—receive his grateful thanks, and acquire by his labor the full value of the pittance thus bestowed upon him.

Deterioration of Brass.

R. O. Dian, of St. Mary's, Ohio, informs us that he worked a great deal of brass in England, and when he came to America he brought a quantity of brass wire—Nos. 13 and 14—with him, which, he thought, had been in the shop about twenty years. Latterly, it has become so brittle that he could not use it, and had to throw it among his old brass rubbage. He believes that long exposure to the air is the cause of it becoming brittle.

Steel and Iron.

The difference between common iron and steel is in the carbon in the latter, but if iron be heated to a white heat and plunged in cold water, it becomes very hard. Mechanics take advantage of this in making axles and collars for wheel work, for it is easily filed and turned in a soft state, and afterwards hardened; this is most commonly practiced in the machine shop. Molders who make wheels, are often embarrassed by this chemical property in iron. For as the metal is poured into the mold of moist sand, the evaporation of the water carries off the heat and cools the iron so quick as to make it extremely hard. This is common in such portions of the metal as have to run the greatest distance from the aperture of reception. The only remedy for this, is to have the sand as dry as possible, and as many apertures as are convenient.

The harder the steel the coarser the grain,—fine steel has the closest grain. A neat curved line and gray texture denote good steel; threads, cracks, bright specks denote bad. The management of the forging may indeed modify these indications, and steel good for some purposes, may be bad for others. Very small articles heated in a candle, are found to be perfectly hardened by whirling them in the cold air; and thin plates of steel, such as the needle of a compass, are hardened by being ignited and laid upon a plate of cold lead and quickly covered with another.

"Case hardening" is that property of iron by which it becomes very hard on its surface. Articles of iron may be case-hardened by smearing their surface with a paste of the prussiate of potash, then heating them to a red heat, and dipping in cold water.

In making tools, the artist is directed by the colors of the steel while heating. The different colors direct, in tempering, to a standard. When steel is too hard, it will not do for tools intended to have a very fine edge, because it will soon become notched, and if too soft, it will too easily bend. Purple is the color for gravers, or tools used to work in the metals; when the color appears in heating, it is immediately plunged in cold water; a very hard temper will be made, if the steel is taken at a yellow color and dipped. Blue is the color for springs and instruments for cutting soft substances, such as leather, &c.

Force of the Wind in a Tornado.

On the 1st of January, Bombay was visited by a cyclone or hurricane, which commenced about midnight, and lasted six or seven hours. It began at S. E., and before its force was expended had gone round the compass to W. N. W. At the hight of the gale the pressure of the wind was equal to thirty-five pounds to the square foot—a force against which nothing living could stand up on open ground. The next morning the gardens appeared as if a heavy roller had passed over them, and the various directions in which the tall Palmyra palms had fallen, afforded a palpable indication of the revolving character of the storm.

Florida Cochineal.

The cochineal is said to be native to Florida; this insect hovers about several varieties of the cactus, but prefers that known as the prickly pear, where it weaves its web and deposits its eggs. In Guatemala it is cultivated to support the insect, being planted in rows on rich lands and kept free from weeds. When twenty months old it is said to be fit to receive the insect. The seed insect is small, and is preserved in boxes, twenty-five pounds being sufficient for one thousand plants. The manner of placing them on the plants is to put a small quantity on a piece of gauze and attach it to a thorn; from this they distribute themselves over the plant, and when come to maturity, which is in about two months, are scraped off gently; and exposed to the sun on a polished piece of metal for some twenty days, and then carefully packed in mats.—[Florida News.

TO CORRESPONDENTS.

A. J. M., of Ala.—We have paid no attention to the cultivation of the cranberry. Your inquiry is better suited to an agricultural journal: we presume the Editor of the *American Agriculturist*, of this city, would very gladly refer you to the proper source of information upon this subject.

T. V., of Cal.—We do not know whether Mr. M. intends to patent his apparatus or not. He has now no patent on it. We are not acquainted with "Drake's Patent." Mr. M.'s works very well; the only objection is the unsteady or trembling motion of the flame.

W. G., of Ohio—Letters Patent were granted, in 1851, to J. Ball for his alleged improvement in eye-cups. You must consult some lawyer as to legal proceedings against the vender of these cups; we have no knowledge of their effects upon the eye.

H. R. D., of Ind.—There is no great difficulty in building chimneys and setting fire places, to prevent smoking. Let the chimney be built with smooth joints, and plastered smoothly all the way up inside, and there will be little danger of its smoking. There is an article in Ure's Dictionary of Arts and Manufactures on the subject. It is sold by Appleton in this city.

G. W. C., of Mich.—Japanned ware is merely varnished tin or sheet iron; the varnish is put on with a brush, and colored, as desired, then baked in an oven. Two or three coats are put on and dried, one after another.

H. R. G., of Wis.—We do not know where you can obtain, a work, such as you want for making the patterns of cog wheels.

B. A., of Wayne Co., Pa.—We think the mode of baking is new; its advantages can only be determined by experiment. You must satisfy yourself on this head; if found to be useful, we believe a patent can be obtained.

C. R., of N. Y.—The *Brevet d'Invention* is a monthly mechanical publication, printed in Paris, and the invention alluded to is public property, no patent having been taken in this country.

W. B. G., of ——.—We have no doubt but you can obtain a cylinder six inches in diameter to stand a pressure of two hundred tuns; it will require a pressure of two hundred and fifty-four pounds to the square inch with a velocity of one hundred and thirty feet per second.

E. T., of O.—You have seen the Benzole apparatus in our columns; consult Mr. Mace, by letter. We are not practically acquainted with Aubin's Generator. It cannot, we believe, be cheaper than coal gas. We do not know whom to refer you, for making small gas apparatus for your Institute. The best plan for you to heat by steam, is to convey the steam in pipes through the rooms. You must take care to allow for a return of the condensed water.

J. B. F., of Mass.—We thank you for your excellent and beautiful work on Hydraulic Experiments. We have only had time te glance over it; we will examine it more thoroughly and give it the notice it appears to deserve so justly.

V. C., of Me.—We do not think it possible for you to obtain a patent on the combination described. We would not if we could, for their is no earthly advantage in it. The plan in present use is more simple, convenient, and effective.

J. W. L., of R. I,—Yours will receive attention next week.

J. T., of Ky.—You can have no better evidence of the defect in pitch of your saw, than its inability to clear itself. If your sawyer says it has pitch enough, then he should be able to tell why it does not clear itself. Practice is the true guide for the working of every saw.

J. H. S., of Pa.—If you get Bourne's Catechism of the steam engine, you will obtain all the information you want about the weight of fly wheels; also the amount of grate surface in proportion to the heating surface of the boiler. We refer you to this source because it would occupy too much space to enter into details.

Coal Gas Apparatus—E. Taylor, of College Hill, Ohio, wishes to know where he can obtain the best coal gas apparatus for making gas, for a large institution consisting of seven buildings.

F. M. P., of Geo.—We think the oil advertised by Mr. Pease, of Buffalo, N. Y., would well answer your purpose. We do not know of anything any better.

M. P., of Mich.—Coal burning locomotives are in successful operation. Dimpfel's patent is in use, and we believe Mulholland, of Reading, Pa., has some in use which re secured to him by patent. It is an important object to be gained in locomotion, as wood is becoming scarce and high.

J. P. G., of Ohio—We are not able to tell you the salaries paid to the different marine engineers. Upon the Collins line the first engineer gets about $1800 per annum.

I. H. G., of Iowa—Machines for pressing brick from the dry or common earth, are in successful use, we believe, in some parts of our country. The special objection to them we have not heard.

J. P. S., of N. Y.—Your engine is new to us, but it certainly will gain nothing in power over an engine with a fixed cylinder. In doubling the effective length of stroke of piston, you use just double the quantity of steam.

C. M., of Pa.—We cannot do anything with your case until the model is received.

R. L., of N. Y.—We have been informed that rosin oil is cheaper than any other, and that it gives an excellent light, but we cannot speak of it from personal knowledge.

J. C. D., of Vt.—You cannot make an application for a patent for an improvement made by one of your workmen. The inventor must make the application.

E. T. Jr., of Va.—We cannot say what effect your device will have for propelling balloons, but we are of the opinion that it would be a waste of time and money to undertake to render it available.

C C., of Ct.—You can get the machinery you want made at Birmingham, Ct., by addressing Sheldon Bassett, at that place. He is agent for a very responsible Company, who make all kinds of machinery and castings to order.

S. D., of Me.—We do not use engineers scales in our drawing department. We use scales of inch size, half inch, quarter, eighth, twelfth, etc.

Money received at the SCIENTIFIC AMERICAN on account of Patent Office business for the week ending Saturday, March 31:—

A. W. F., of Pa., $10; W. & W. F. B., of Mass., $30; U. C. L., Jr., of Mass., $30; E. D., of N. Y., $30; C. & H., of O., $35; J. A. R., of Mass., $20; T. McC., of Ala., $30; J. S., of Ill., $10; P. B., of Ct., $20; E. F., of Ct., $300; L. & T., of Pa., $30; N. E. G., of Miss., $25; G. B. S., of Ct., $25; J. A. R., of N. Y., $25; S. & A., of N. Y., $25; A. L., of Pa., $25; J. Y. S., of Pa., $25; T. R. D., of N. Y., $20; L. Y., of N. Y., $50; J. S. M., of N. Y., $55; E. D. C., of N. Y., $30; G. R., of Mass., $50; A. S., of Pa., $25; E. W. G., of Mass., $60; W. A., of Ky., $25; W. S. F., of N. Y., $20; N. W., of Ala., $30; J. B. D., of Mass., $30; J. W. H., of R. I., $100; L. L., of Mass., $20; P. L. S., of Ind., $10; C. R. R., of N. Y., $30; P. S., of N. Y., $20; W. M., of N. Y., $10; J. D. B., of N. Y., $27; S. & R., of Vt., $25; W. P. A., of N. Y., $5); J. H. K., of N. Y., $30; J. W., of N. Y., $25; T. S., of N. J., $25; I. F. W., of N. Y., $25; K. K., of N. Y., $25; J. S., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, March 31:

J. S., of Mass.; J. & W. L., of Ind.; G. A. M., of N. Y., P. B., of Ct.; R. H. G., of N. Y.; C. W. F., of Ct.; J. Y. S., of Pa.; J. H. T., of N. J.; J. W., of N. Y.; J. W., of Me.; A. L., of Pa.; G. B. S., of Ct.; N. E. G., of Miss.; L. & T., of Pa.; J. S., of N. Y.; T. S., of N. J.; S. & A., of N. Y.; I. F. W., of N. Y.; S. M., of Ill.; W. A., of Ky.; G. R., of Mass., (2 cases); A. S., of Pa.; L. L., of Mass.; K. K., of N. Y.; W. P. A., of N. Y.; J. H. K., of N. Y.; J. S., of N. Y.; T. D. B., of N. Y.; S. & R., of Vt

Important Items.

PATENT LAWS, AND GUIDE TO INVENTORS—Congress having adjourned without enacting any new laws pertaining to applications for patents, we have issued a new edition of the old laws, which may be had at our counter or sent by mail. This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office Price 12½ cents per copy.

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. Of Vol. 10, all the back numbers, at the subscription price.

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.

American and Foreign Patent Agency.

UNITED STATES PATENT OFFICE,
Washington, March 6, 1855.

ON THE PETITION of James Brett, of Matteawan, New York, praying for the extension of a patent granted to him on the 10th July, 1841, for an improvemvent Key Wrenches, for seven years from the expiration of said patent, which takes place on the 10th day of July, 1855—

It is ordered that the said petition be heard at the Patent Office, on Monday, the 25th of June next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 15th of June: depositions, and other papers relied upon as testimony, must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Scientific American, New York, and Post, Boston, Mass., once a week for three successive weeks previous to the 25th day of June next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 29 3

Science and Art.

History of Reaping Machines.—No. 26.

On the 19th of September, 1854, a patent was granted to Jas. S. Burnham, of West Jefferson, Ohio, for improvements in corn harvesters, embracing three claims, relating to an oblique platform for cutting reels, for collecting the stalks, and devices for discharging the stalks, (see claims on page 22, Vol. 10, Sci. Am.) On the same date a patent was granted to Abner Whiteley, of Springfield, Ohio, for grain harvesters; first, for having a suspended rake attached to one of the reel blades, and so combined with guides to direct the grain to the cutters, and also to discharge it when cut in a superior manner; second, for a latch to make the rake take more or less grain, as desired; third, for a peculiar manner of placing the cutter and its bar between fingers, to obviate the use of slot guards, (see same page Sci. Am.)

On the 26th of September, 1854, a patent was granted to J. J. Weeks, of Oyster Bay, N. Y., embracing a spiral track clearer, and the teeth of the sickle made with thin cutting edges, so bevelled that one side cuts below by the stroke in one direction, and the other above by the return stroke, (see claim, page 30, Vol. 10, Sci. Am.)

On the 17th October, 1854, John H. Manny, of Rockford, Ill., obtained a patent (antedated June 15th) for an arrangement of the platform obliquely to the cutter, to allow of discharging the gavels at a sufficient distance from the standing grain; also for a wing combined with the platform to facilitate the gathering of the grain, and for making the outside dividing finger hollow, (see claims page 54, Vol. 10, Sci. Am.) On the 31st Oct., 1854, the patent of J. Adkins, dated originally Dec. 21st, 1852, for an automatic raker, was re-issued, (see claims page 70, Vol. 10, Sci. Am.) On Nov. 14th, same year, a patent was granted to Jacob Swartz, of Buffalo, embracing two claims, one for giving the cutter bar four strokes every revolution of the crank shaft, and the other for a method of hinging the cutter and guard stock bar in such a manner as to make the cutter rise and fall, to cut both grass and grain, (see claims page 86, Vol. 10, Sci. Am.) On the 21st November, same year, a patent was granted to Cyrenus Wheeler, Jr., embracing two claims for an improved method of hanging the cutter bar so as to render it more capable of action when operating on uneven ground, (see claim page 110, Vol. 10, Sci. Am.) On the 19th following, a patent was granted to J. S. Gage, of Dowagiac, Mich., for a clover harvester, which combed off the seed by a series of combs, that were thrown out and drawn in through the openings of a cylinder, into which the seed was drawn, (see claim on page 126, Vol. 10, Sci. Am.) On the same date, a patent was granted to W. F. Ketchum, of Buffalo, N. Y., for constructing the driving wheel so that it could be enlarged, and better adapted for changing the machine into a mower or reaper at pleasure, (see claim same page.)

On the 2nd of January, 1855, a patent was granted to John E. Brown, and S. S. Bartlett, of Woonsocket, R. I., for devices to make the cutter vibrate more correctly when operating on uneven ground, (see claim on page 142, Vol. 10, Sci. Am.) On same page is the claim for a patent granted to M. Burnet and C. Vander Woerd, of Boston, Mass., for making the driving axle of the cutter serve as the pivot, or center of the joint between the cutter and carriage. On the same page there are the claims of John H. Manny, of Rockford, Ill., for seven patents—all re-issues of former patents—the substance of which have already been presented.

In our history of Reaping Machines we desire to shed all the light we can, not only on the machines themselves, but the inventors also; we therefore publish the following verbatim letter from J. H. Manny, the well-known inventor of Reaping Machines, in which he tells his own story:

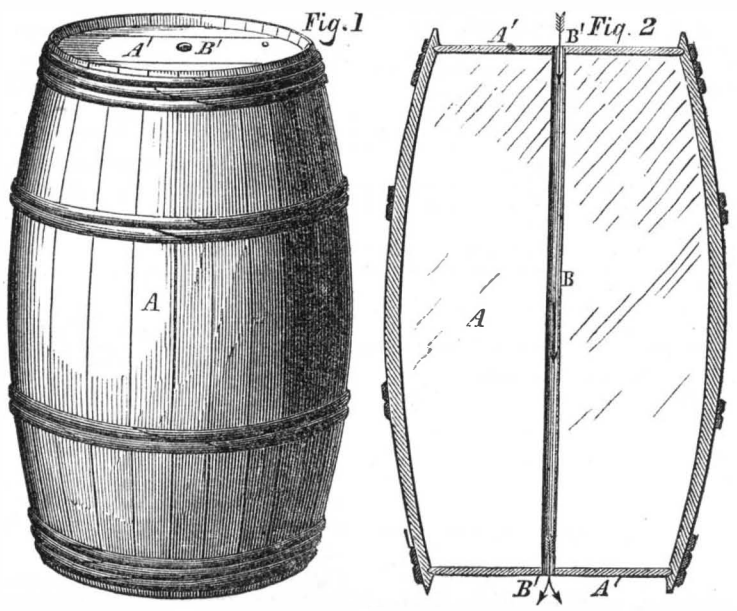
ROCKFORD, Ill., March 15, 1855.

MESSRS. MUNN & Co.—*Dear Sirs:* I have not yet heard from you in reference to my proposition. As you have, it seems, not concluded to accept the same I withdraw it, and all other correspondence with you I wish cancelled. Also I hereby give you notice not to publish anything in reference to me or to my machine, or give any illustrations of the machine, or any of my patents, in any way or manner: I shall hold you responsible for any violation of this notice. I forbid you making any allusion to my machine in your History of Reapers. Yours truly,

JOHN H. MANNY.

[What we have done to so disturb the equanimity of Mr. Manny, to induce him to pen so tart an epistle is more than we know. So we insert the above, trusting some of our correspondents, who are acquainted with Mr. M., may enlighten us. The presumption is that he finds, from our columns, that other patents exist in mowing machines besides those granted to him, and perhaps he has taken umbrage, because we refused to insert in our columns some engravings of his machine, in which the horses predominated to so huge an extent that the mechanism of the machine was entirely hid. These reasons may seem small for such an onslaught, but we can think of no other transaction we have had with Mr. Manny, hence the inference that his temper has been disturbed from one of the above-named causes.

VENTILATING FLOUR BARREL.



The annexed engravings are views of an improvement in flour barrels, for which a patent was granted to Thomas Pearsall, of Smithboro', N. Y., on the 27th of last June.

Figure 1 represents a flour barrel, and figure 2 is a vertical section through the center showing the ventilating tube.

It is well known to practical men that all commodities containing in themselves the constituents necessary to produce fermentation, will, when closely packed in bulks of sufficient size to prevent the air from penetrating them, sooner or later generate heat at the center, which gradually diffuses itself through the mass; hence the enormous quantity of flour, meal, &c., spoiled in transportation and storing.

It is also well known that decomposition invariably commences at the center of the bulk, owing to the increased pressure there, and to its being further removed from the refrigerating influence of the atmosphere; it is a common occurrence on opening a barrel of flour to find it perfectly sweet and good at top, bottom, and around the outside of the bulk, while at the center it will be both hot and sour. While this is common in bulks of the size of a flour barrel, it is rare in a half barrel. On this theory the invention is based, and to remedy this evil there is inserted a tube or tubes longitudinally through the cask in which such commodity is to be packed, for the free circulation of air therethrough, so that the center of the cask is no longer the center of the mass; in proportion as you increase the diameter of the pipe you increase the number of centers in the bulk, thus mathematically dividing the mass into as many parts as required, which is equivalent to dividing the mass into as many smaller packages.

A represents a flour barrel with holes, B', in each end in the center of the heads, A', to receive the tube, B, figure 2. In filling the cask, the head, A', is taken out, and the tube, B, inserted in the hole in the lower head of the cask, the desired quantity of flour or meal is packed therein, and the upper head, A', is put into the cask again, the tube, B, protruding through the holes in each end of the cask, about half an inch, more or less, which is to be hammered down, forming a flange on the heads. Thus the air can circulate freely through the center of the bulk, and its liability to heat is entirely obviated, and at the same time the cask is materially strengthened. When larger casks are used, several tubes may be inserted in the same manner, if found necessary. These tubes may be made of iron, tin, wood, or any other suitable material—porous, perforated, or otherwise.

More information may be obtained by letter addressed to Mr. Pearsall, at Geneva, N. Y., to which place he removed about the 1st inst.

PRESERVING FLOUR AND GRAIN—In addition to the above specification of this ventilating barrel, Mr. Pearsall furnishes the following useful information on the important subject of preserving flour and grain. His practical experience, (of 25 years' standing) in all that relates to milling, packing, and exporting flour, adds great weight to whatever he says on the subject.

"The preservation of grain and flour has engaged the attention of agriculturists since a very early period, but no mode has been discovered by which any of the cereal grains can be preserved for a series of years, in a sound and healthy state, unless the inherent moisture in the grain has been expelled by solar heat, and this cannot be thoroughly effected except in arid climates.

The kiln-drying process has, to some extent, been resorted to in this country, for Indian corn, with a view to its exportation, in the form of meal, in a dry state. But an artificial temperature, which deprives grain of its moisture, deprives it also of its saccharine matter; hence the insipid taste of all thoroughly kiln-dried corn meal. The editor of the London Marklane *Express*, of Oct. 1854, says: "Of some forty samples of corn meal on sale that day in the market, at least twenty were entirely unfit for human food, and the others were more or less musty." The editor further remarks, "If sweet meal could be procured it would feed the million, and soon find its way to the tables of the more opulent." This testimony seems to be pretty conclusive that on the 16th of Oct. last there was no sweet corn meal in the London market. When the use of the tubular barrel becomes general in this country, the difficulty of which the London editor complains will be removed.

The nature of my invention may be considered under three heads. 1st. The removal of the center of the mass. 2nd. The division of the same mathematically; and, 3rd. A passage is opened for the escape of the moisture in the mass. It is a well settled principle that heat is first generated at the center of all vegetable matter when in mass or bulk.

Wheat, rye, corn, &c., in bins or in bulk, invariably commence to heat at the center of the mass, never on the outside, as some have asserted. Hay in stacks, and in barns, is subject to the same unerring law. To counteract this evil, large dealers in grain employ a strong force, especially during the summer and fall months, to turn over their grain, air its center, and liberate the moisture. The tubular barrel has, strictly speaking, no center. A tube three inches in diameter, passing through the center of the barrel longitudinally, annihilates the center; instead of it being the point at which heat generates, producing sour flour and musty meal, it is is fact the coolest part of the barrel.

Prof. Beck, of Albany, states the quantity of water in the best Western flour to be from 11 to 13 per cent. Corn meal contains a greater quantity. To the outer surface of the tube this water is strongly attracted, and it passes off in the form of vapor at the ends of the barrel. I do not hesitate to say that flour and meal of sound grain put up in the tubular barrel, may be shipped to any quarter of the globe, without any change, save that which is effected by the escape of its inherent moisture. T. PEARSALL.

LITERARY NOTICES.

PUTNAM'S MONTHLY—The April number of this able periodical, as usual, contains eighteen original articles besides editorial notices. One article on "Curiosities of Puritan History—and Toleration," is worthy of being read with humility for human nature, and with thankfulness for the toleration of the present, in comparison with past ages. It also contains a review of Abbott's Napoleon, that might sharpen the teeth of a file. Dix & Edwards, No. 10 Park Place, this city, will be the future publishers of this magazine.

HOUSEHOLD WORDS—Conducted by Charles Dickens.—This piquant and very instructive publication is published by Dix & Edwards, at No. 10 Park Place, New York. The April number has several very interesting articles: Faraday, Howitt, Leigh Hunt, and Barry Cornwall, are regular contributors. We wonder if any body expects anything but a good work from such prolific authors? Of course not.