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RAIL-ROAD NEWS.

Railroad Accidents and Management.

A return was made, on the 10th of last May, to the House of Commons, England, by the Railway Department of the Board of Trade, showing the number and description of accidents which took place on all the railroads in Britain, during the last six months of the previous year. The number killed was 113, and the number injured 264. The whole number of passengers carried was 47,509,392; this includes the whole number of accidents by carelessness, self-destruction, collision, &c. Out of this number only eight passengers were killed, or only one person in every six millions carried. The rest who were injured and killed were persons in the employ of the several companies, trespassers, &c. The safety of such a system of travelling as that of the English railway, is a most wonderful triumph of good and skillful management. When we consider the high velocities of their trains, the thickly populated districts through which they run, and the great number of passengers carried, we look upon such a system of railroads, and their management, with wonder and admiration. The double tracks of these roads tend to promote safety, for it is certainly reasonable and obvious to any man who can reason, that they must be more safe than railroads of single tracks; and yet a correspondent—an engineer—in the American Railway Times, subscribed himself as a believer in the safety of single over double tracks; in other words, he believed that accidents were more frequent on double than single tracks. The safety of the English system of railroads is well worthy of the attention of our people. It is the duty of all Americans, as being the greatest utilitarians in the world, to adopt everything that is good and useful, without any reference to the source whence it is derived.

A French Railway Train Struck by Lightning.

The Moniteur de Loiret states that during a late thunder storm the electric fluid struck the luggage wagon of the train proceeding from Orleans to Paris, and after having made an irregular hole in it, passed through the articles of luggage without doing them any injury, and then ran along the iron chains which unite the wagons together. The conductor, who was seated on the luggage wagon, experienced a sharp electric shock, and all the passengers in the train one of slighter description.

The great tunnel on the Nashville and Chattanooga Railroad has been completed, and the opening of the railroad through was to be celebrated with a great festival, in which ten thousand persons were expected to participate, on the third inst.

Privileges have been granted by the Hawian government to run a line of steamships between the Sandwich Islands and San Francisco. Messrs. Glen, McLane, and Patterson are the owners of the line.

IMPROVEMENTS IN NAVIGATION,---THE BENDER.

Figure 1.

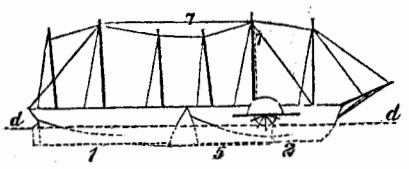


Figure 2.

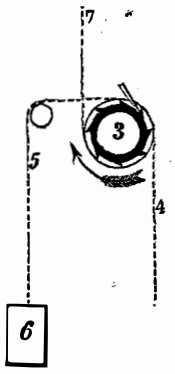
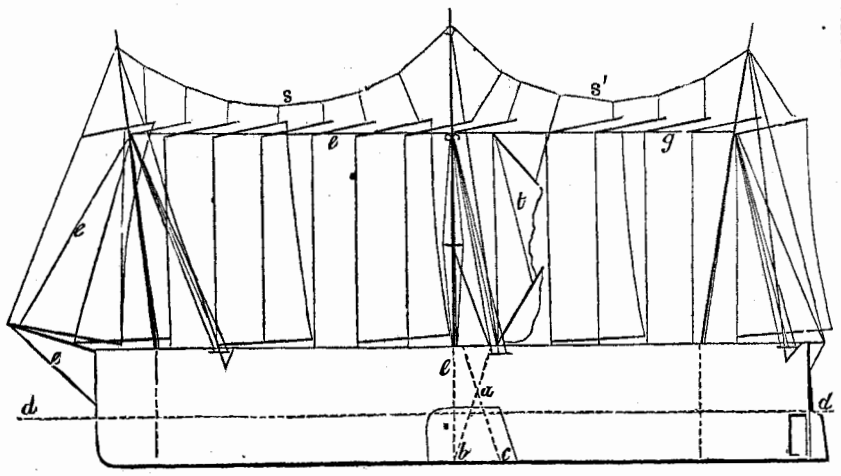


Figure 3.



A general, although rude, idea ot the design of this contribution to the art of navigation (for which letters patent are now being sought) may be obtained by supposing the following case :—

Let two ships (1, 2, fig. 1) be tied together, the stem of one to the stern of the other, in such a way that they cannot swing around. A strong chain passes from the mainmast-head of 1 over a pulley on the maintop of 2, and down into the hold, where it winds around a wheel on the shaft of the paddle-wheels. A similar chain passes from the foot of the cutwater of 1, along the keel of 2, and ascends through a well up to a second wheel or pulley on the shaft. Exposed to rising and falling waves, the motions of these ships would cause the chains to draw alternately upon their pulleys on the shaft. Figure 2 explains the mode of this action. At 3 is seen a section of the shaft, and one of the pulleys (that worked by the keel-chain). The shaft carries a ratchet wheel, and the pulley has a catch, dropping into the teeth, so that when the rising of either ship causes the keel-chain to draw upon its pulley, the shaft must revolve in the direction of the arrow. When that pull is ended, and the reverse motion begins, the rope, 5, by means of the weight, 6, takes up the slack of the keel-chain, so that the pulley is ready for the next draw. The action of the mast chain, 7, is precisely similar, but the teeth of its ratchet-wheel point in the other direction. The fall of the head-ship causes the mast-chain to drive the shaft with the arrow, while its rising is attended with a pull from

Figure 4.

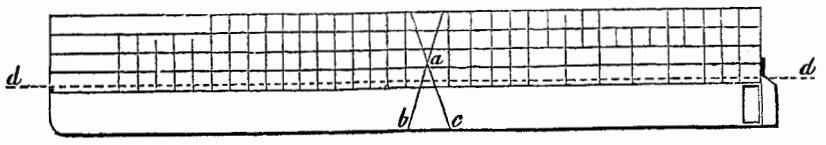


Figure 5.

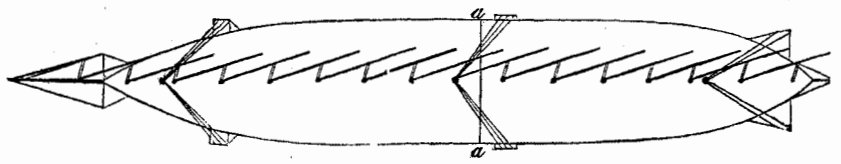
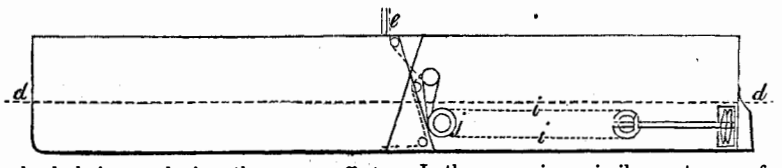


Figure 6.



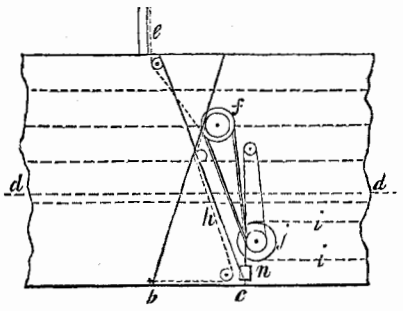
the keel-chain, producing the same effect. The motive power is the weight ot the ships. and its limit the strength of the chains.

This mode of tying ships together is obviously absurd; but is it not possible to cut a very long ship in two, and so attach its sections that an effective use can be made of this magnificent wave-power?

In the engravings, similar parts are referred to by the same letters. The point of flexible juncture is seen at *a a*; at *a b*, *a c*, are strong bulkheads; the powerful iron hinges are in the sides, with a base of 50 feet for resisting ateral strains. The angle, *b a c*, shows the extent to which the fore-ship may drop below the line of the aft-ship.

The engravings suppose a length of 300 feet, with a breadth of 50; but, on the water-line, *d*, the breadth is only 40 feet, with a rapid decrease below that line; draft of water 20 feet, with a deep keel; ballast, as little as possible.

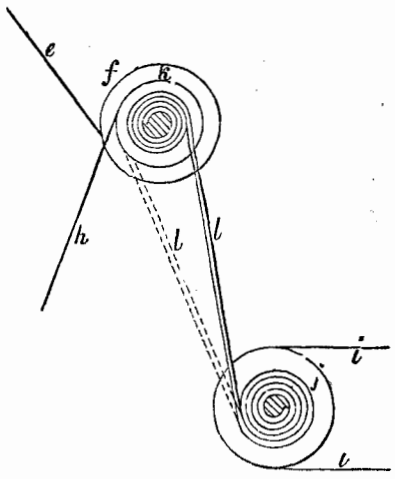
Fig. 7



Whether bent at the middle, over the crest of a wave, or hanging with its stem and stern elevated upon two crests, the position of the Bender must, under all circumstances, be nearly upright. It will have great stability, even when its upper deck is thirty-feet above the water-level, as shown. Its sides may, there fore, sately swell out above the water-line, instead of "tumbling in," as it has no heavy spars aloft.

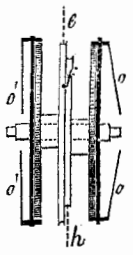
The foot of the mainmast is movable in a socket; it stands a few feet before the line of the hinge-joint, *a*, and its shrouds are as far abaft that line, so that however this vessel may bend, the top of the mainmast is always

Fig. 8.



equi-distant from the fore and mizzen masts. (If fast, the mainmast had better stand on the aft ship; unless the vessel is cut in two at two points, which would require *four* masts and various new arrangements). A strong wire-rope, *e*, starts out from the cutwater, passes over the bowsprit, over the top of the foremast, over a pulley at the mainmast-head, and from thence down along the mainmast into the hold, where its end is made fast to the double wheel or pulley, *f*, fig. 7. A similar wire-rope, *g*, passes horizontally from the head of the mizzenmast to and around another

Fig. 9.



pulley at the head of the mainmast, from which it goes down some thirty feet, and unites with *e*. A chain, *h*, passes out from the keel at *b*, goes around a pulley near *c*, and thence up to a smaller part of the double pulley, *f*, figs. 7, 8, and 9, (the two parts of the pulley being firmly fastened together). The fall of the fore-ship, on crossing a wave, causes the rope, *e*, to pull upon *f*, and its rising causes the keel-chain, *h*, to make a pull in the op-

posite direction. Both *e* and *h* are of great strength, and tightly drawn, so that the ends and the middle of the Bender cannot rise or fall to any extent, without giving more or less motion to the double pulley, *f*. This power has to be given over to the paddle-wheels or propelling screw, with a velocity proportioned to its varying force. A shaft from the screw enters the vessel far enough to reach a sufficiently wide space for the wheel-work to be attached to its fore-end, as shown in fig. 6. The power is sent to that point through the endless chain, *i i*, from the distributing pulley, *j*, which gets it from the receiving pulley, *k*, attached to *f*.

The chains, *l l'*, made thick, with cast-iron blocks, connect *j* and *k*, fig. 8. At each end, these block-chains are made fast to eccentrics, shaped like *m*, fig. 10, so that as the rectangular blocks are wound around the eccentric, the diameter of the coil is rapidly increased, and the power of the chain over the wheel is greater. The block-chain, *l*, gives over to *j* the power of the keel-chain, *h*; and *l'* gives over that of the mast-rope, *e*. The pulls of *e* and *h* are made more or less effective in driving the propelling screw, according as more or less of the length of the block-chains is wound up on the eccentrics at each end. The distributing pulley, *j*, has a rope attached to each eccentric for its block-chains, carrying a weight, *n*, fig. 7, the effect of which is to take up the slack of its block-chain and coil it up on the eccentric, ready for the next pull. Each block-chain has own its weight, *n*, and they act alternately.

The receiving pulley, *k*, is shown in figs. 9, 10, and 11. All the parts in fig. 11 rotate together, with a reciprocating motion, in obedience to the alternate pulls of *e* and *h*. Fig. 10 is one of the eccentrics with its ratchet-wheel—both cast in one piece. In fig. 9 both eccentrics, with their ratchet wheels, are in place. The detents, *o o*, are shown engaged; while those on the other side, *o' o'*, are disengaged, as their levers are pressed towards the sides of the double pulley. When both sets of detents are disengaged, the pulls of *e* and *h* have no effect upon the block-chains, *l l'*, and the propelling screw has no power laid upon it. If, at the end of a pull, (say of the mast rope, *e*), the engineer were to disengage the detents, *o' o'*, and at the same time press with a brake upon the ratchet-wheel of that eccentric, the block-chain, *l'*, would not (during the return motion of *e*), be coiled upon its eccentric at *d*; but the next pull of *e*, would wind up an additional length of the block-chain upon the eccentric on *k*, thus increasing the diameter of that coil, and causing it, when receiving the next pull, to drive the propelling screw with more force. If the disengagement of the detents be made the instant before a pull is to begin, the weight, *n*, fig. 7, draws in more of its block-chain upon the coil at *j*, increasing the diameter of that coil just as much as it diminishes the coil on *k*. This adjustment retards the revolutions of the screw. The engineer thus can proportion the effect of the alternate pulls to the strength of all parts of his machinery, whether the wave-power is strong or feeble. The stress of the wave-power upon the hull of the vessel is all resisted in right lines. The machinery, therefore, takes up very little room, and requires no massive bed-plates.

The hull being of an unusual height and rather broad, each of its sections, (the fore and the aft ship), becomes a sort of triangular pyramid, capable of the strongest bracing without much weight of materials. The Bender should float lightly upon the water, while its deep keel guards against lee-way. Its great length gives the finest opportunity for "wave-lines," under the bows and quarters. The booms sweep immediately over the surface of the hurricane deck (figs. 3 and 12), which covers up boats, spars and lumber of every kind, and presents, with the sharp prow and stern, the least resistance to a head wind. The gap, (*b a c*, fig. 3), in the vessel's bottom, is covered with a plate-iron shield, the edges of which are shown in fig. 3. Its turning point (as the middle of the Bender plays up and down), is near the forward edge, a little below the water line. A sheet-copper flap covers the forward edge, preventing the water from flowing in, while the motion of the vessel causes any water that may be within the gap, to flow out behind the shield. The curves for the bottom, suggested in fig. 12, will greatly strengthen the shield.

The planking of the sides and decks should be double, and laid cross-wise for strength. Many posts should pass up from the lower side frames through all the decks, as in fig. 12. Besides family state-rooms and very ample cabins, this vessel should have some five or six hundred comfortable baths for cabin passengers.

A light framing is justifiable, from the Bender being in sections of 150 feet, and having no central strains, which, in ordinary ships, endanger their "hogging." A 50 horse-power steam engine should be placed near the after-end of the fore-ship, sending its power by an endless chain to the receiving pulley, *k*, to be used in entering and leaving port, in calms, and in emergencies.

Fig. 10.

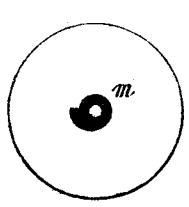
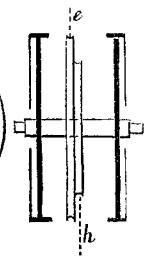


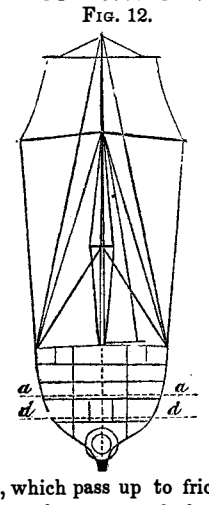
Fig. 11.



The masts admit of strengthening and bracing along the middle of their length, as in the drawings of the mainmast, figs. 3 and 12. The downward strain of the mast-ropes, *e* and *g*, fig. 3, may at times be enormous, requiring great strength in the masts to resist it, if the engineer attempts to use too much of the wave-power. The topmasts should stand *on* the heads of the lower masts; all the shrouds should be of iron.

Excepting three top-sails for favoring winds, all the sails are "fore-and-aft," fixed on booms and gaffs. Their forward edges run on slender wire-ropes, which extend from the deck to the mast-ropes, *e* and *g*, fig. 3, and easily bend with the wind, holding the sail flat or "broad-wise" to a head wind. The next to the foremost sail has no gaff. The booms should be twice the length of the spaces between the sails; so that, in tacking ship, they all (excepting the hindmost boom), have to be raised and the gaffs lowered, as in the sail *t*, fig. 3. This great labor is done by the vessel itself; by means of power taken off from the distributing pulley, *j*, fig. 8, through end-

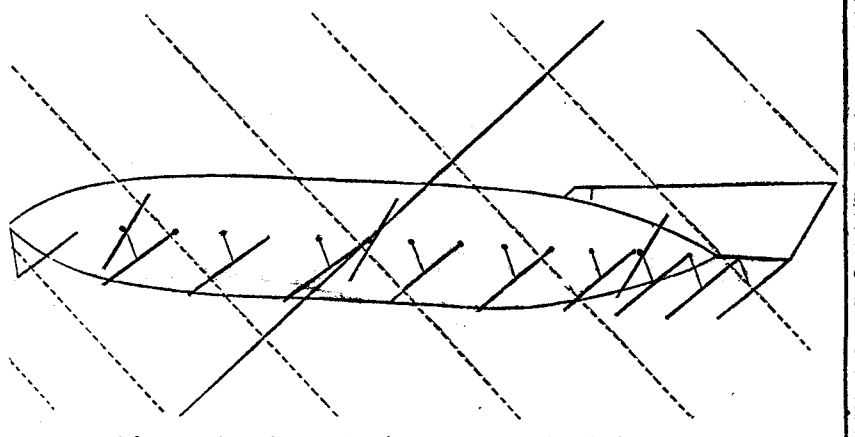
Fig. 12.



less ropes, which pass up to friction pulleys at the foot of the masts on deck. The lifting ropes from a series of booms are so connected that a single rope, wound around a friction-pulley, and pressed by a brake, commands them all. The wave-power is necessarily in action when the wind is ahead. When running before the wind, with little or no wave-power, the propelling screw is always revolving from the re-action of the water. The friction pulleys thus always have power when the Bender is moving with any considerable speed; by which power (rather than by a numerous crew), the labor of working the ship is to be done. The great length of the Bender requiring a powerful rudder, the wheel should be worked by friction pulleys of its own, rather than by the helmsman's strength.

Fig. 13 shows this vessel running before a favoring wind, and spreading a wide sweep of canvas. The top-sails are set; the forward sail is seen to be double—with two booms and gaffs—and the hindmost has a studding sail. Fig. 5 shows the Bender close-hauled, all the fore-and-aft sails being set at two points from the ship's course. With long ridgy seas, and a steady head wind, the Bender will find this

Figure 13.



course one of the most favorable for showing what it can do by combined wind and wave power.

As the pull of the block-chains is accelerating, a balance-wheel, connected with the propelling screw, will contribute much to maintain the revolutions between the pulls.

The curve ropes, *s s'*, fig. 3, starting out from the fore and mizzen top-mast heads, pass over pulleys in the head of the main top-mast, and after descending along the mainmast some forty feet, unite in one rope, and go on to a suitable weight which plays up and down a well in the hold.

In scudding before an impracticable sea, the Bender should keep her head to the wind, and steer by power taken from the screw.

For voyagas in high latitudes, with free winds and unfrequent calms, the Bender, without the burden of a powerful steam engine and its fuel, will probably make better time than the ocean steamers. For more information, we refer to John H. Ewin, Esq., Nashville, Tenn.

Union of Telegraphs.

Some important arrangements and combinations in the "world of wires," have taken place recently, by which the Morse and O'-Reilly Telegraphs have been united throughout the West and Northwest. The New Orleans and Ohio line, extending from New Orleans to Pittsburg, the People's Line, from New Orleans to Louisville; the two wires of the Louisville, Cincinnati, and Pittsburg line, and the Western line from Wheeling and Pittsburg, to Baltimore and Washington City, are all direct parties to the contract. By these arrangements most of these lines come under the Morse government, and it is the intention to put the prices up about one-third

We have a developing here of that plan by which the chemical telegraph line between Philadelphia and Baltimore was crushed by a decision at law, to be merged into one huge monopoly.

Age of Sheep.

The age of sheep may be known by the front teeth. They are eight in number, and appear all of a size. In the second year the two middle ones fall out, and their place is supplied by two large ones. In the third year a small tooth on each side. In the fourth year the large teeth are six in number. In the fifth year the whole front teeth are large. In the sixth year the whole begin to get worn. In the seventh year some fall out or are broken.

It is said that the teeth of ewes begin to decay at five or six; those of weathers at seven, productive for sixteen years.

Medical.

Dr. G. W. Davis, of Syracuse, N. Y., in an article in the "Eclectic Journal of Medicine," says he used hydrochloric acid (muriatic acid and water) as a valuable remedial agent in the treatment of many forms of disease, especially in the derangement of the stomach and bowels. He regards it as a valuable tonic and astringent, always operating properly and kindly. In nearly all derangements of the digestive organs when there is a proportion of alkaline secretions, the hydrochloric acid he has found acts promptly and safely. He has found it successful for acute dysentery, after all other means have failed. The way in which it is given, is one drachm of commercial muriatic acid mixed with half an ounce of water; 20 drops of this is given in half a gill of sweetened water every sixth hour.—This has been used successfully as the only remedy for acute dysentery. He has found the muriated tincture of iron very useful in many cases and considers it better than the nitrate or sulphate.

The Hillotype again.

The last number of the Ulster County (N. Y.) Examiner, gives an account of a visit to Mr. Hill, the discoverer of the art of daguerreotyping in colors, when the editor was shown some specimens of the art, in which, he says, the most diversified and delicate hues and tints were rendered with the most beautiful distinctnes. The writer adds:—

"That the uncovered plates were put in his hand for the most rigid examination by the full light of an unclouded summer day. And one which had not been burnished, was put to that process in his presence, when it took in an instant, the rich enamel-like surface, which distinctly marks the Hillotype from those of the daguerreotype. The fact is, (as we saw from experiment,) the Hillotype is very difficult to remove from the plate as compared with the daguerreotype, nor is it sensitive to the effect of the atmosphere like the latter."

[Mr. Hill must surely be demented, if he can produce sunlight colored pictures and remain with a black patch on his name when he can so easily wipe it off.

Roquert Swamp—Ship Timber, &c.

This swamp is situated near Windsor, Bertie Co., N. C.; in length, it is about twenty-seven miles, its average width about seven. This tract of swamp has heretofore been considered worthless, but very lately Lieut. W. D. Porter, while on a visit to Mr. Gillam, was requested by that gentleman to penetrate and examine the resources of the swamp. He did so, and found that its resources could be developed by cutting a short canal to the Cashie river. He is now engaged on this project, which, when finished, will be the means of bringing forward dead capital to an immense amount. Nearly all of this timber will reach the port of Norfolk. The lands of the swamp that are now considered worthless, can be drained by this canalling, after the timber is exhausted White oak plank and knees, the finest timber in the world for ship building, grow along the banks of the swamp in abundance; fine pine for spars can also be procured; and but a short time back Mr. Gillman delivered at the Norfolk navy yard $2,000 worth of this pine timber, which was pronounced to be the best government ever received.

Genius.

I know no such thing as genius, said Hogarth to Mr. Gilbert Cooper: Genius is nothing but labor and diligence. Sir Isaac Newton said of himself, "that if he had ever been able to do anything, he had effected it by patient thinking only."

Lord Bacon remarked that a man would do well to carry a pencil in his pocket, and write down the thoughts of the moment.—Those that come unsought are commonly the more valuable and should be secured, because they seldom return.

Dean Swift said with much truth, "It is useless to attempt to reason a man out of a thing he was never reasoned into." The best argument will be thrown away upon a fool.

Emery.

There are many who use emery every day, but who do not know where it comes from, or how it is manufactured for use. We have recent accounts of emery discoveries in Minesota, but nearly all that is used at present in the arts comes from Turkey, near ancient Smyrna. Dr. Lawrence Smith, the American Geologist, made a discovery of a deposit of emery while residing in Smyrna, and he made an examination of the locality in 1847.

Dr. Smith having reported his discoveries to the Turkish government, a commission of inquiry was instituted, and the business soon assumed a mercantile form. The monopoly of the emery of Turkey was sold to a mercantile house in Smyrna, and since then the price has diminished in the market.

The mining of the emery is of the simplest character. The natural decomposition of the rock in which it occurs facilitates its extraction. The rock decomposes into an earth in which the emery is found imbedded. The quantity procured under these circumstances is so great that it is rarely necessary to explore the rock. The earth in the neighborhood of the block is almost always of a red color, and serves as an indication to those who are in search of the mineral. Sometimes, before beginning to excavate, the spots are sounded by an iron rod with a steel point, and when any resistance is met with, the rod is rubbed in contact with the resisting body, and the effect produced on the point enables a practiced eye to decide whether it has been done by emery or not. The blocks which are of a convenient size, are transported in their natural state but are frequently broken by large hammers; when they resist the action of the hammer they are subjected to the action of fire for several hours, and on cooling they most commonly yield to blows. It sometimes happens that large masses are abandoned, from the impossibility of breaking them into pieces of a convenient size, as the transportation either on camels or horses requires that pieces shall not exceed 100 lbs. each in weight.

Emery appears to be a mechanical mixture of corundum and oxide of iron.

When reduced to a powder, it varies in color from dark grey to black. The color of its powder affords no indication of its commercial value. The powder examined under the microscope shows the distinct existence of two minerals, corundum and oxide of iron Emery when moistened always affords a very strong argillaceous odor. Its hardness is its most important property in its application to the arts, and was ascertained by Mr. Smith in the following manner:—Fragments are broken from the piece to be examined, and crushed in a diamond mortar with two or three blows of a hammer, then thrown into a sieve with 400 holes to the inch. The powder is then weighed, and the hardness tested with a circular piece of glass, about 4 inches in diameter, and a small agate mortar. The glass is first weighed, and placed on a piece of glazed paper; the pulverized emery is then thrown upon it at intervals, rubbing it aginst the glass with the bottom of the agate mortar. The emery is brushed off the glass from time to time with a feather, and when all the emery had been made to pass once over the glass, it was collected, and passed through the same operation three or four times. The glass was then weighed, again subjected to the same operation, the emery by this time being reduced to an impalpable powder. This series of operations is continued until the loss sustained by the glass is exceedingly small. The total loss in the glass is then noted, and when all the specimens of emery are submitted to this operation under the same circumstances, an exact idea of their relative hardness is obtained. The advantages of using glass and agate are, that the latter is sufficiently hard to crush the emery, and in a certain space of time to reduce it to such an impalpable state, that it has no longer any sensible effect on the glass; and, on the other hand, the glass is soft enough to lose during this time sufficient of its substance to allow of accurate comparative results. By this method, the best emery was found capable of wearing away about half of its weight of common French window-glass. The blue sapphire of Ceylon, pulverized and experimented with in this manner, wears away more than four fifths of its weight. This furnished the standard of comparison.

In the ordinary process, the lumps of emery ore are broken up in the same manner as stone is for repairing macadamized roads, and into lumps of similar size. These lumps are then crushed under stampers, such as are used for pounding metallic ores, driven by water or by steam power. It is supposed that the stampers leave the fragments more angular than they would be if they were ground under runners, a mode which is sometimes employed. The coarse powder is then sifted through sieves of wire cloth, which are generally cylindrical, like the bolting-cylinders of corn-mills; but the sieves are covered with wire-cloth, having in general about 90 to 16 wires to the inch. No. 16 sieve gives emery of about the size of mustard-seed; and coarser fragments, extending nearly to the size of peppercorns, are also occasionally prepared for the use of engineers. The sieves have sometimes as many as 120 wires in the inch; but the very fine sizes of emery are more commonly sifted through lawn sieves. The finest emery that is obtained from the manufacturers is that which floats in the atmosphere of the stamping-room, and is deposited on the beams and shelves, from which it is occasionally collected. The manufacturers rarely or never wash the emery; this is mostly done by the glass-workers, and such others as require a greater degree of precision than can be obtained by sifting.

Washing emery by hand is far too tedious for those who require very large quantities of emery, such as the manufacturers of plate-glass and some others, who generally adopt the following method:—Twelve or more cylinders of sheet copper, of the common height of about two feet, and varying from about 3, 5, 8, to 30 or 40 inches in diameter, are placed exactly level, and communicating at their upper edges, each to the next, by small troughs or channels; the largest vessel has also a waste-pipe near the top. At the commencement of the process, the cylinders are all filled to the brim with clean water; the pulverized emery is then churned up with abundance of water in another vessel, and allowed to run into the smallest or the 3-inch cylinder, through a tube opposite the gutter leading to the second cylinder. The water during its short passage across the 3-inch cylinder, deposits in that vessel such of the coarsest emery as will not bear suspension for that limited time; the particles next finer are deposited in the 5-inch cylinder, during the somewhat longer time the mixed stream takes in passing the brim of that vessel; and so on.—Eventually the water forms a very languid eddy in the largest cylinder, and deposits therein the very fine particles that have remained in suspension until this period; and the water, lastly, escapes by the waste pipe nearly or entirely free from emery. In this simple arrangement, time is also the measure of the particles respectively deposited in the manufacture to which the emery is applied. When the vessels are to a certain degree filled with emery, the process is stopped, the vessels are emptied, the emery is carefully dried and laid by, and the process is recommenced.

Emery-paper is prepared by brushing the paper over with thin glue, and dusting the emery powder over it from a sieve. There are about six degrees of coarseness. Sieves with 30 and 90 meshes per linear inch, are in general the coarsest and finest sizes employed. When used by artizans, the emery-paper is commonly wrapped around a file or a slip of wood, and applied just like a file, with or without oil, according to circumstances. The emery paper cuts more smoothly with oil, but leaves the work dull.

Emery cloth only differs from emery paper in the use of thin cotton cloth instead of paper, as the material upon which the emery is fixed by means of glue. The emery-cloth when folded around a file, does not ply so readily to it as emery-paper, and is apt to unroll.—Hence smiths, engineers, and others, prefer emery-paper and emery-sticks; but for household and other purposes, where the hand alone is used, the greater durability of the cloth is advantageous.

Emery-sticks are rods of board about 8 to 12 inches long, planed up square, or with one side rounded like a half-round file. Nails are driven into each end of the stick as temporary handles, they are then brushed over one at a time with thin glue, and dabbed at all parts in a heap of emery-powder, and knocked on one end to shake off the excess. Two coats of glue and emery are generally used. The emery sticks are much more economical than emery-paper wrapped on a file, which is liable to be torn.

Emery-cake consists of emery mixed with is a little beeswax, so as to constitute a solid lump, with which to dress the edges of buff and glaze wheels. The ingredients should be thoroughly incorporated by stirring the mixture whilst fluid, after which it is frequently poured into water, and thoroughly kneaded with the hands, and rolled into lumps before it has time to cool. The emery-cake is sometimes applied to the wheel whilst they are revolving; but the more usual course is, to stop the wheel, and rub in the emery cake by hand. It is afterwards smoothed down by the thumb.

Emery-paper, or patent razor-strop paper an article in which fine emery and glass are mixed with paper pulp, and made into sheets as in making ordinary paper. The emery and glass are said to constitute together 60 per cent. of the weight of the paper, which resembles drawing paper, except that it has a delicate fawn color. This emery-paper is directed to be pasted or glued upon a piece of wood, and when rubbed with a little oil, to be used as a razor-strop.

In 1842, Mr. Henry Barclay, of England, took out a patent for a method of combining powdered emery into discs and laps of different kinds, suitable to grinding, cutting, and polishing glass, enamels, metals, and other hard substances. The process of manufacture is as follows:—Coarse emery powder is mixed with about half its weight of pulverized Stourbridge loam and a little water or other liquid, to make a thick paste; this is pressed into a metallic mould by means of a screw-press, and after having been thoroughly dried, is baked or burned in a muffle or close receiver at a temperature considerably above a red heat and below the full white heat. In this case, the clay or alumina serves as a bond, and unites the particles very completely into a solid artificial emery-stone, which cuts very greedily, and yet seems hardly to suffer perceptible wear.

Superfine grinding emery is formed into wheels exactly in the same manner as the above, but the proportion of loam is then only one-fourth instead of one-half that of the emery. These emery-stones, which are of medium fineness, cut less quickly, but more smoothly than the above.

Flour-emery, when manufactured into artificial stones, requires no uniting substance, but the moistened powder is forced into the metal mould and fired; some portions of the alumina being sufficient to unite the whole. These fine wheels render the works submitted to them exceedingly smooth, but they do not produce a high polish on account of the comparative coarseness of the flour-emery.

Locomotive Improvements.

Mr. Editors—Knowing that you like to keep yourselves posted up on all matters relating to improvements in machinery, I think it may not be uninteresting to you and your readers to know that there was an improvement on locomotive steam engines got up here in February last, which bids fair to make a material reduction in the cost of running railroad trains, and of course increasing the profits of railroads. It is the invention of Israel P. Magoon, of this town, Chief Engineer of the Passumpsic Railroad, and consists of an apparatus for heating the water carried in the tender tank of a locomotive, while the machine is running on the road, by making use, for that purpose, of the heat, and heated exhaust steam, which, after it has left the boiler, usually passes off through the chimney and escapes. The apparatus has been thoroughly tested on the "Caledonia" engine, keeping the water in the tank (while running) at from 90 to 150° Fahr. Experienced engineers on the Passumpsic Road, who have repeatedly run the "Caledonia" before and since the heater was attached to it, both on passenger and freight trains, assert that it saves from one quarter to one-third of the fuel, an item of no small amount in railroad expenditures. It also gives the engineer a better command of his machine, as he can pump water into it without reducing the steam going up as well as down grade, and it also enables railroad companies to use smaller machines to do the same work for which they are now compelled to use large ones. Measures have been taken to secure a patent, and in due time the invention, with all its details, will be brought before the public. P.

St. Johnsbury, Vt., June, 1852.

[Does the exhaust steam not pass up through the smoke pipe? If not, how is the proper draught maintained?—Ed.

A Serpent in a Railway Train.

Recently, towards evening, the travellers journeying to Paris by the train from Havre, were greatly terrified by an extraordinary incident. The train carried a collection of wild beasts, which were destined to appear at the Hippodrome, in a representation of a piece called the "Christian Martyr." The animals were under the charge of M. Herbert, a friend of Gerard, the lion tamer. The collection was accompanied by a boa constrictor, seventeen feet in length, which was intended as a present to the director of the Hippodrome. The serpent was contained in a box suspended under the van which held the beasts. Whether the box was too small or the animal too large, may be doubtful; but the serpent was dissatisfied, and breaking one of the sides of its prison, wound its way to the top of the train, and amused itself by passing from one carriage to another. When it had promenaded in this manner unperceived for nobody knows how long, it announced its presence by thrusting its head up close to the engine-driver. To describe the cry of terror which the poor man sent up would be impossible. The train was immediately stopped, and M. Herbert, with two African assistants, took measures for capturing the reptile, which wound itself about the machinery of the locomotive, and was only detached with much difficulty, and secured in a box stronger than the first. Although the serpent had not visited those in the interior of the carriages, the passengers by the train were exceedingly nervous, and expressed a strong dislike to accompany the boa to Paris.

Fall of a Bridge.

The Boonsboro' Odd Fellow says:—"The wooden suspension bridge over the Juniatta river, six miles north-east of Shirleysburg, Pa., gave way and fell with a crash in the water below, a height of forty-five feet. At the time the bridge fell the team of Mr. Daniel Shindle was crossing. Two men with the team were seriously but not fatally wounded, and two horses were instantly killed. The bridge was erected upon the Remington principle, and was owned by a company, upon whom the loss falls heavily. It was only erected last summer. The bridge is a total loss, except the abutments and piers."

Water-Melon Butter.

Split the water-melons open, with a spoon scrape out the pulps into a cullender, and strain the water into vessels; boil it down to syrup, then put in apples or peaches, like making apple butter or any kind of preserves. Or the syrup may be boiled without fruit down to molasses, which will be found to be as fine as the best sugar-house molasses. The season for making this table sauce will soon be at hand; those who wish to partake of it should be prepared for the event.

Soundings were taken on board the U. S. Sloop-of-war Albany, with a line of wire 5,700 fathoms, without finding any bottom; this was in the Atlantic Ocean, 300 miles east of Bermuda. There is an under as well as an upper current in the Atlantic; the under one runs in an opposite direction to the upper one. The bottom of the ocean is like that of the dry land—hill and valley.

Fruits, such as apples, pears, and quinces, may be kept a long time unfaded, by dipping the end of the stem in melted white wax, and laying them carefully in a dry place.

The surface of a human body, middle size, is estimated at 15 or 16 square feet.

NEW INVENTIONS.

Ventilating of Railroad Cars.

Harvey Law, of New York City, has taken measures to secure a patent for a novel and important improvement in the ventilation of railroad cars. The object of the improvement is to supply the cars with cool pure air, free from dust, by blowers worked by belts receiving motion from the revolution of the axes of the cars, or from the engine. It is well known that if it were attempted to drive a current of air through a train of cars, it would be very disagreeable, owing to the cloud of dust and sand with which the atmosphere around a train of cars is charged. This evil is entirely obviated by Mr. Law; he brings the air in contact with revolving moist surfaces, in troughs below the cars, and they take up all the sand and dust out of the air, and the air is afterwards driven through the cars cool and pure. The doors and windows can thus be kept perfect close, so that no sparks will enter to annoy, and there will be no danger of accidents by putting heads and arms out of the windows. The principle is different from all others we have seen, and we hope some of our enterprizing railroad companies will soon give the invention a complete and fair test. At the present time those who wish for comfort and clean clothes keep clear of railroad travelling, except in cases of necessity. There can be no disguising the fact, that some important reform is wanted to keep dust, smoke, and sparks out of our railroad cars. We hope that every railroad company will give this subject attention, and so provide proper remedies for these evils. Our river steamboats are the finest in the world, and possess the most accommodations; on the other hand, our railroads are far behind those of the first class in Europe. We must push along and keep improving.

Improvement in Smelting Furnaces.

Christopher G. Best, of the city of Albany, N. Y., has taken measures to secure a patent for an improvement in smelting furnaces, which is of no small importance. The furnace is a reverberatory one, and the fuel and metal are separated in two different chambers but quite near to one another. The flame and heat is brought down vertically through the metal and spread equally over and all through it. The ashes of the coal is not allowed to mix with the metal. It can act both as a draught and a blast furnace. It can be charged at intervals the same as the cupola furnace, and it works with great convenience and economy.

Eyes of Millstones.

D. P. Gerberick, of South Bend, County of St. Josephs, Ind., has taken measures to secure a patent for an improvement in the eyes of millstones, the object of which improvement is to prevent the clogging of the stones when grinding moist grain, middlings, &c., which are liable to do so. The improvement consists in forming the upper portion of the eye of an inverted conical shape, and the lower portion of the eye of a conical shape also, the base of the lower cone being at the face of the stone, and the smaller ends of the two cones meeting at a point above the centre of the stone. The lower end of the damsel is also of a conical shape, the base of the damsel cone being of sufficient area to cover the fork which strides the bail of the stone.

New Process of Making Butter.

Mr. James Stubbs, of Cuttyhunk Island, informs us of a new process of making butter from the cream, which promises to supersede the labor of the churn at least during the warm season. At his dairy recently, a quantity of cream which had obstinately refused to become butter under any reasonable or even unreasonable amount of agitation in the usual mode, was at length emptied into a clean "salt-bag" of coarse linen, and deposited in the ground at a depth of twelve inches below the surface, to cool. On the following morning it was found that the buttermilk had entirely disappeared, and the butter remained in the bag perfectly nice and sweet. He has since frequently manufactured butter by this method, with invariable success, in from six to twelve hours. As an effectual preventive of any earthy taste becoming imparted to the butter, Mr. Stubbs suggests that the bag containing the cream be placed in another bag, or cloth, of the same material. The value of the discovery may be easily tested.—[New Bedford Mercury.

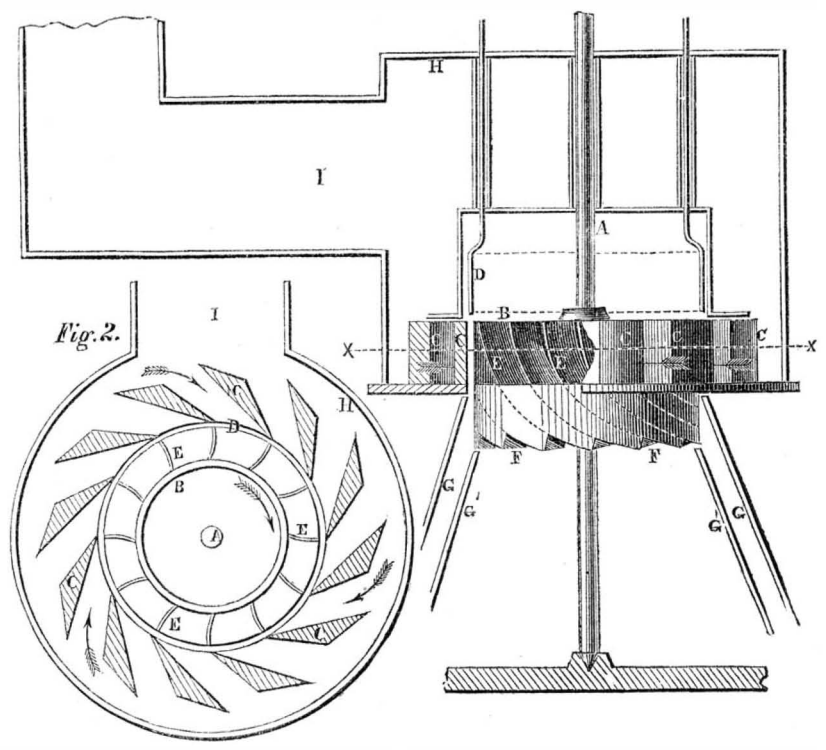
[This is certainly a new way of making butter, but it does not strike us as being at all a commendable plan. A little ice perhaps would have done all the burying process did.

A good Railroad Improvement.

The Michigan Central Railroad, we learn, by properly sodding their track, have got rid of all the annoyances which formerly arose from wind and dust. Within one month a road may in this way be rendered dust-proof and at little more expense than is required during the same time to tinker up sprinklers.

We hope this improvement will be adopted by all the railroads in other States.

JONVAL TURBINE WATER WHEEL.---Fig. 1.



The accompanying engravings are views of the turbine water wheel with improvements as made by Henry Vandewater, Albany, N. Y.

Figure 1 is a vertical sectional elevation, showing the buckets, flume, &c. Figure 2 is a plan view of figure 1 taken at X X, showing the guide shutes, bucket, and wheel. The same letters refer to like parts. A is the vertical shaft of the wheel, B; C C C are the guide shutes to admit and direct the water on the buckets, E E. The buckets have a peculiar form, and are set on the plate of the wheel so as to afford good action in the discharge. The outlets, F F, of the buckets are contracted from the inside to allow the re-action to be exerted nearest the extremity of the buckets; G′ is a hollow cone made of cast metal, and G is another surrounding it, the water discharging from the wheel between them. The inner cone is permanently secured to the base plate, while the outer cone can be moved up and down to affect the amount of water discharged by the wheel; H is the outside casing; I is the water flume; D is a gate which encircles the wheel, and is raised up and down, to increase the pressure of the water on the wheel, or vice versa. It shuts off all the water from the buckets by being pushed down to cover and surround them, or it leaves a part or a whole of all the buckets open to the inlet water. The inlet water and the wheel move in the same direction, as indicated by arrows in figure 2.

This wheel has received some very high testimonials for efficacy and good working qualities; Mr. Vandewater warrants it to do all he says it will, and will guarantee every one he puts up. He has been engaged in putting up wheels for a number of years, but has no agent now for his old wheels, he only puts up his improved Jonval Turbine here represented. There can be no mistake but this is a good wheel, it is warranted to give from 70 to 78 per cent. the value of the water-power used. These wheels are cast to order in Townsend's Foundry, Albany, N. Y., where excellent work is always produced.

More information may be obtained by letter addressed to Henry Vandewater, 545 Broadway, Albany, N. Y.

Important Railroad Invention.

A very important invention, says the Germantown (Pa.,) Telegraph, has been made by Messrs. Jacob S. Provest, and Conrad P. Smith, two intelligent mechanics, of this borough, (who have taken measures to secure a patent,) in boxes for railroad axles, which is likely to make a complete change in this part of the running-gear of cars to the great diminution of accidents, and hence the loss of life and property.

We cannot convey a better idea of this invention than to make an extract from the specification, which states that in the arrangement of the car axles, as now practiced, no provision is made in the boxes for the play of the axle, so as to allow it to stand at right-angles with the line of the car when turning or running on curved lines; the consequence is, that the outer wheels, having the greater distance to run, must slip on the rail backward, or the inner rail slip forward, to compensate for such unequal travelling distance.

The breaking of axles, in a very large majority of cases, occurs while turning curves and can only be accounted for by the torsion or twisting of the axles in turning said curves. To obviate these difficulties and dangers, is the object of this invention, and to do so it is arranged as follows:—

The steps in which the spindles of the car axles run are made in two pieces, so that when any strain may come upon them in the line of the running of the car, they may be forced apart sufficiently to allow the axle to come up into proper position, to prevent the otherwise twisting of it by being cramped between the rails. The two-part step may have a tongue both upon the top and bottom, which may work in corresponding grooves in the top and bottom of the box, or it may slide in a rebate; in either the box may be so provided with flanges as to form a receptacle for the oil. 'Behind each of these parts of the step, springs are arranged, which admit of the step being opened when turning curves, and closing it when coming on straight lines, thus allowing the axle to adjust itself as the nature of the case may require. The spring behind the step also allows it to yield slightly when the wheels strike against any obstruction on the road, thus taking the sudden jar or strain upon the springs instead of the spindles of the axle, as in cases where the boxes are right, and which often bend or break the spindle.

Having examined a model and seen it experimented with, we cannot resist the conclusion that the invention of our ingenious townsmen will prove to be of very high importance to the public, in making travelling by railroad far more secure than formerly—a consumation which is devoutly to be wished.

The Compound Rail.

J. F. Winslow, of Troy, N. Y., the inventor of the compound rail returned in the steamer Atlantic from England, he having gone there to make arrangements about the manufacture of his compound rail. We have been informed that he was perfectly successful in his foreign negociations for the making of the compound rail, in England, for several railroads in the United States. He had arrived but one day when the mill at South Troy was burned down. The whole of the Nail Works belonging to Corning & Winslow, we see it stated, were destroyed. This will throw quite a number of workingmen out of employment for some time, and will be a great loss to the proprietors also; but the gentlemen who own the works will soon have them rolling away again. They are wealthy, enterprizing, and energetic.

An Improved Railroad.

Mr. Carpenter, of Rome, N. Y., has made an improvement in the ordinary iron railroad, calculated greatly to diminish the liability, if not utterly preclude the possibility of a train running off the track, under any circumstances. The improvement consists of a middle rail of iron or wood, running the whole length of the track, precisely in its centre, and raised a foot or so above the side or bearing rails. Friction rollers are attached to the engine and cars beneath, to play upon the sides of the middle or guiding rail, whereby the motion of each car is steadied, and any tendency to fly the track at once arrested.—This seems to us a very good thing, especially since it will prevent any break down or smash up in case of a wheel or axle giving out.—[Tribune.

Rider's Cotton Batting for Mattrasses, &c.

On page 294, this volume, Scientific American, there is to be found a claim for improvements in cotton batting, the patent for which was granted on the 18th of last May. The improvement consists in making cotton batting into a kind of felt. We stated in a note annexed to the claim that it was *an important invention* for upholsterers, and that it would yet be an article of principal use for all kinds of upholstering purposes. Since that time, although it is not long since, it has become a material of extended application. We have used it ourselves in some articles which heretofore were all made of curled hair, and we find it equally as good for our purpose and certainly it is a great deal cheaper. We believe the improvement to be a most excellent one, and that it will be the means of conferring many benefits, especially upon the great mass of our people, who are neither poor nor rich.

The inventor and patentee is E. P. Rider, No. 194 Columbia street, Brooklyn, N. Y., and we wish to direct attention to the subject because we believe the improvement is one of no ordinary merit, and because we believe that we do good by spreading as far and wide as we can, a knowledge of any article that will conduce, especially, to greater domestic comforts when connected with economy in price.

The temperature of human blood is 104° Fahr., it is independent of the place where man lives; it is constant, and external objects act upon it by addition or subtraction of caloric, according to the more or less heat of these bodies; this is the cause of the sensation of heat or cold, and it is from this peculiarity that man is enabled to live in all climates.

They say that fish may be carried alive any distance by putting on them a good coating of compact clay, wet with salt water, and surrounding it with ice. In this way you may see swimming in the fish-mongers tubs at Paris fish brought from the coast of Denmark.

The Koh-i-noor.

The Fifeshire Journal says that Sir David Brewster has demonstrated that the immense diamond which figured in the exhibition is not the genuine Koh-i-noor, but a very fine diamond nevertheless, and is the one Shah Sojah gave up to the British as the real mountain of light.

Of all the senses granted by nature to man, the most precious and most rare is *common sense.*

Scientific American

NEW-YORK, JULY 10, 1852.

Iron Structures.

Widely extended as the uses and application of iron has become within a few years, we must say that its superiority as a material for buildings does not yet seem to be publicly appreciated. A few iron buildings in this city, some in Baltimore, Philadelphia, and other places, have been erected, but when we take into consideration the advantages, beauty, and durability of such structures, we are not a little surprised that so few of them have been erected in our country. That so few iron structures have been erected in New York city, says but little for public sagacity, and is not a little mortifying to that progressive, pushing, utilitarian fame of which New Yorkers seem to be so proud. There is no city in the world where so many buildings are constantly being erected as in New York. There is a continual tearing down and building up going on from March until December, every year. On every hand in every street, are to be seen pile upon pile of mortar, stone, and brick. The number of houses undergoing renovation every day, reminds one of a field previous to a battle, when from each busy camp there comes the hurried sound of armorers driving rivets up. Strangers visiting our city every few years say, "well, you are building a new city here all the time;" it is really so. We presume that, owing to obstructions in our streets, caused by pulling down old buildings and putting up new ones, the dust, dirt, and trouble connected therewith, costs the public a tax of some millions every year. The tax is not levied by law, but it is not the less certainly exacted for all that. Let any citizen imagine the benefits that would be conferred upon the public by substituting cast-iron buildings for those of brick. The piles of brick and mortar, and the clouds of dust, which now obstruct our streets, and cause such general annoyance, would all disappear. Here, as at present, where there has been accumulating for days and perhaps weeks, a mountain of materials blocking up the street and annoying everybody, all would be clear, and the pathway unobstructed. There would appear the space for the building, and all clean and quiet around it on Monday morning. In a few minutes some carts would arrive with beautiful cast-iron blocks, and a few men with derrick, block, and tackle would be seen quietly hoisting these blocks and fitting them into their places, and perhaps by evening—in a few days at most—a building which will endure for ages, will be seen standing erect, in dignity and beauty, where at morn there was nothing but an empty space. This can be done,—this has been done; and we should like to see it done ottener. There would be no falling of walls, either, owing to miserable mortar; nor would there be any fears for the freezing of cement. It would be well for every city and village in our country, if there were less danger from fires, consequently if there were more buildings erected of fire-proof materials, there would be fewer fires. The fire engines and the fire departments of cities and villages, are exceedingly burdensome systems of taxation. It is also well known that the conduct of many firemen is very disreputable, and exceedingly dangerous to young men. During the past week a fearful riot took place among the firemen of Williamsburgh (the scene was more like an engagement of contending fiends than human beings), and another riot of a like nature in Brooklyn. More iron buildings would be the means of preventing fires, and if cheap rural cast-iron cottages could be erected in our villages, there would be fewer fears of fire raising, less to pay for insurance, and less for fire companies. The public could afford to pay good high prices for iron structures at first, for they are the cheapest in the end. All the cast-iron buildings which have been constructed in our country, have been erected by the inventor, Mr. Bogardus, of this city, whose taste and constructive skill are of the very highest order. We hope that more attention will be devoted to the utility of cast-iron structures by the men of capital in our city.

What is Man?

Much as is known of anatomy and the organic structures of creation, the most learned physiologist is exceedingly ignorant of the primary organism of man. Throughout creation there prevails a common structure of recognized organization—the element of which is denominated "the simple cell." Here nature remains still wrapped in mystery, and we believe will ever remain so. The cell of one organism appears exactly like another, but as the cell developes itself, how different are the final productions—that of man and the inferior animals. Yet all follow after their kind, and there is no variation. Every seed bringeth forth after its kind, and so do all the races of animated nature. The great Creator who impressed the simple cell with a property for the production of a man, can surely impress upon man the property of that developement which will enable him to live forever as a glorified being. No man can detect in the human machine, by its construction, that it is made to run for only 70 years, but it moves by a command or law over which it has no control creatively, and then ceases to move by the same fiat. Why this should be, no one can tell; we know it is so, and that is all, and we have no more reason to suppose that this is the final state of man, than a simple organic cell, would have to suppose it was *its* final state. So uniform is the simple cell in its structure, the microscope cannot detect the least variation wherever examined; everywhere is to be seen the same wonderful identity, from the humblest plant to the highest state of animal organization, but when it developes itself and becomes humanity, we behold an intelligent being, shaping out, as it were, a destiny for himself, which endureth beyond mere physical organizations and results—which affects his own and future generations. How fearfully and wonderfully made is man; how often he resembles an angel,—how often a demon. With a lofty intellect he counts the stars, measures their distances from one another, and even weigheth them in his balance, and yet at one time he could not be distinguished from the cell of a plant. Man is endowed with great wisdom, and yet how often is he to be seen more degraded and less wise than the brutes which perish. Although he can send his thoughts thousands of miles distant in a few minutes, he is continually reminded of his humble origin—that from dust he came and to dust he must return, until the final resurrection, when the nature of all things shall be changed—when mortality shall be swallowed up of life.

The Art of Bleaching Cotton.

Snowy linen and cotton are beautiful articles of apparel, but their whiteness is the result of art. Linen is of a dirty yellow appearance in its raw state, and although cotton is whiter, still, as compared with the bleached fabric, it is a dingy color indeed. In connection with cotton in its natural state, there exists substances which have a tendency to operate along with certain atmospheric influences, and aid in the decomposition of cotton cloth. One of these is an earthy salt, taken up from the soil with the fibre, the other is mucilaginous matter. The object of the bleacher is to get rid of these. The original method by which the separation of these matters from the cloth fibre took place, was such as to give rise to the opinion that the process interfered very much with the quality of the cloth. The process was at first rude. It was the custom to subject the woven fabric to the action of some alkaline lye, or some acidulated element. Lemon juice was very extensively employed. In England, which was the last country in Europe to take up the question of the cotton trade, and to devote its attention to the manufacture of that article, the practice was this:—The persons engaged in bleaching a piece of woven cloth composed of vegetable substances, burnt some wood to ashes till they got the usual result of a white, powder ash. This was suspended in a coarse cloth, tied at the ends, something in the form of a hammock; and water being poured upon the surface, it took up a substance now known by the name of potash. This was carried through by the water, and deposited beneath; the goods were then subjected to the action of this substance for different periods, varying from three to four days to as many weeks. They were then spread upon the grass, where they were allowed to remain for some weeks. Being again taken in, they were submitted to the action of the alkaline lye, and afterwards, if any appearance of color remained, to sour milk; then to the fields again, and again, perhaps, to the ash lye, till at length they managed to get a piece of goods white. Thus the cloth was half worn out before it came to be made up for use, and it was no wonder if a shirt of such material did not last so long as one formed from cotton which had undergone no such destructive process. People were quite right, therefore, in giving the preference to unbleached calico, once, and they are yet, where the bleaching is not well understood The practical bleacher, of the present day, is a practical chemist, and knows exactly what materials to employ, and in what proportions to take up the substances he desires to remove from the cloth. Calico is now more durable after bleaching than it would be without it.

The reform accomplished in the art of bleaching was made by the discovery of chlorine as a bleaching agent. Before its application to bleaching, it took upon six months, amid sunshine, rain, and wind, to bleach a linen handkerchief; now this feat can be accomplished in a few hours, and at most a few days. The properties of chlorine, as a bleaching agent were first discovered by a Swedish philosopher, from the effects produced upon the cork of a phial containing muriatic acid. It was first employed in France. The first bleach-works in Britain were established near Glasgow, by Mr. Macgregor, the father-in-law of James Watt, who, having heard of the discovery of chlorine from a learned correspondent in Paris, at once communicated it to his relative, by whom it was turned to good account.

The art of bleaching has been the means of bringing millions upon millions of wealth into the lap of Great Britain and it may well be said, when we take Watt's great improvements of the steam engine into consideration, that he has done more for the mechanic and practical chemical arts of that country, and perhaps the world, than any other man.

Without bleaching, it would not be possible to apply so many beautiful colors to the surface of cotton cloth, as are now applied. Unless the ground of the cloth were clear, the colors would be dull and indistinct, and many would not take hold of the fibre of the cloth at all. The mucilage, for instance, would prevent the introduction of mordants, without which it is impossible to get a fast color. The art of bleaching consists, at present, in first boiling green cotton goods, as they are called, in lime water, in large keers, for some hours, then washing and afterwards steeping them in chlorine liquors for some hours, then washing and steeping them in a weak sulphuric acid liquor; and repeating these two latter processes until the goods are perfectly white, when they are thoroughly washed and then finished. The chlorine used is obtained by stirring some of the chlorate of lime in cold water, in hogsheads, and using the clear. The chlorate of lime was the discovery of Charles Tennant, in Glasgow, and a great deal of the chlorate of lime used in America is made at Tennant's works. When the art of bleaching by chlorine was, and by whom introduced into our country, we cannot tell.

The Scotch are the most famous for bleaching in Europe. At one time Holland was the most distinguished country for bleaching, and the finer qualities of linen made in Scotland and Ireland used to be sent to Holland to be bleached. An Irish bleacher who learned the art in Holland, introduced it into Scotland, but then it required a whole summer to bleach a fine sheet. The first bleach-fields were erected on small clear streams; the cloth was first steeped in cow's urine—which was the only alkali then in use by cottars—it was then washed in a tub, a woman trampling it with her feet, and changing the water till it came off pretty clear. It was then beat on a stone, and spread out on the grass for some days, where it was well watered. These operations were repeated till the color pleased the owner.

When we look back and see what progress was made in this art in a century, we have reason to feel grateful. There are plenty of bleached goods of a very tender character, owing to their not being well washed. It is positively necessary that all the lime should done be removed from the cloth: this cannot be unless enough of sulphuric acid is employed to render the lime a sulphate, when it can be easily removed by washing—it will flow off in fine solid particles. It would be well if bleachers would finish their last washing of bleached goods before drying, in clear water of at least 160° Fah. The warm water would remove every particle of acid, and would drive off all the chlorine if any were left in the cloth. This practice would involve more expense to our bleachers, but it would be a good plan for the wearers of the cloth.

Independence Day.

Last Sabbath was the 75th anniversary of the day on which the Declaration of American Independence was adopted and signed. The day was kept in a more becoming manner than if it fell upon any other day, still our people wish to shoot and make considerable noise on such occasions, consequently Monday was the day which was observed as Independence Day.

When we take into consideration that free institutions cannot exist but among a virtuous population, we should be very careful, as a people, to inculcate virtuous deeds, and nurture the rising generation in sound morality. Freedom consists in obedience to good laws, and of the protection of all in their just rights. In our cities and villages the rising generation seems to be growing up without virtuous restraint, and with great contempt for good and wholesome law. We must depend upon our rural population to counteract this evil tendency—to be a good leaven, or we may bid farewell to the blessings conferred upon our country by the Revolution. We consider that those men who never tell the people of their faults, in the fine Orations made on the Fourth of July, do not do their duty to their God, their fellow men, and their country.

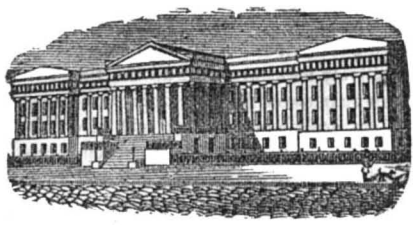
New Light House.

A lighthouse has been erected on the Romer Shoal, which is about two miles east of Sandy Hook, and directly in the entrance of the harbor of New York. The engineer was J. W. P. Lewis. It is built in water 13 feet deep; it is 20 feet in base diameter, of an octagon form, and is 50 feet high. The principle of its construction consists in screwing into the sand of the shoal, at each angle of the octagon and in the centre, one of Mitchell's screw-piles; the blade of each screw being two feet in diameter, and entering the sand to a depth of ten feet; attached to the screw are nine wrought-iron shafts or piles, each 6 inches in diameter, and 32½ feet in length, extending to a height of 8½ feet above high-water mark; on the top of these piles heavy cast-iron sockets are keyed, to which are attached also by keys the cast-iron shafts, which, rising from the pile-heads, and uniting in a centre-frame at the tops, form the supporting braces for the basket frame, or distinctive mark of the Beacon, which is secured to a prolongation of the centre pile, at a height from the level of the sand of 63 feet. The whole of the piles and shafts are securely braced, and counter-braced by wrought-iron tie-rods, keyed to the sockets, rings, or pile heads, forming altogether one of the most efficient systems ever erected for such a purpose. The whole weight of the structure is but 75 tons, and it cost the Government but $10,000. Whereas, a stone structure would not cost less than $35,000, at the least estimate—that being the cost of a stone beacon on the same shoal, and but 40 feet in height.

The screw piles is the invention of an Irish engineer, Mr. Mitchell, of Belfast, we believe. It was patented in England some years ago, but found no great public favor for some years, and he did not receive remuneration for the value of his invention before his patent expired. It was renewed to him upon mature consideration of its great importance. A great number of lighthouses or beacons are built upon his piles, in Britain.

Henry Clay.

This great statesman died in the city of Washington on the 29th ult. He was called the Model Senator. He died of old age—the tide of life ebbed slowly and gently away.



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JUNE 29, 1852.

MILL STONE DRESS—By Wilson Ager, of Kohrsburgh, Pa.: I claim the rounding off of what is usually termed the feathered edge of mill stones, for grinding buckwheat, so as to present a round smooth surface, instead of a cutting edge, as set forth; and this I claim, whether said furrows are polished, sharpened, or straightened by rubbing the same with a burr block, after said furrows have been roughed out with a pick or other tool, or by any other means substantially the same.

HULLING BUCKWHEAT—By Wilson Ager, of Kohrsburgh, Pa.: I claim the method described of scouring or hulling buckwheat, by passing it through between horizontal stones, the runner having furrows on its face, substantially as represented, and cut in the direction of the motion of the stone, with the design of keeping the grain from leaving the stone too fast, and for rotating both on their short and long diameters, and the bed stone left without furrows, in the manner and for the purpose set forth.

SAIL HANK—By Samuel Barker, of New York City: I claim the construction of a divided hank, so formed that one part may embrace the stay, and the other part enter the eyelet of the sail, and the parts be connected together by the socket, or one receiving the shank of the other, and be confined by the bolt, for the purpose of securing sails to the stay, substantially in the manner set forth.

APPARATUS FOR PROPELLING VESSELS—By M. A. Crooker, of New York City: I claim the combination of the radius bars, upright lever, cranks, horizontal lever, carrying paddles, and curved slots, arranged with respect to each other, and connected and operating substantially as set forth.

REVOLVING LAST HOLDER—By Henry C. DeWitt, of Napanock, N Y.: I claim, first, the revolving stock, constructed, arranged, and operating in the manner set forth.

Second, the revolving last holder attached to the revolving stock, and having an adjustable rest or arm, the whole being constructed, arranged, and operating in the manner specified.

RAILROAD CAR TRUCKS—By C. B. Disbrow, of Bath, N. Y.: I claim the construction of a truck with independent wheel frames, strengthened by braces, and connected to the opposite side wheel frame, by the bar extending across the truck, upon which said wheel frames may vibrate, substantially as set forth.

POTATO DIGGERS AND STONE GATHERERS—By J. T. Foster, of New York City: I claim the use of the roller, having a series of rows of pins in the periphery, and secured on an axletree of a cart or other moving apparatus, in combination with an adjustable apron, having teeth in it, and a discharging plate having teeth in it, substantially for the purpose of gathering stone, potatoes, fruit, or other substances, or articles, and depositing them in a box, as set forth.

LOCK—By Francis Garachon, of New York City: I claim the arrangement of the lever, and its accessories, for latching and unlatching the bolt relative to the lever W, or locking the revolving key plate, whereby the auxiliary kev acts upon the former, by being lifted endwise and upon the latter by its bit, when revolving in the usual manner, substantially as set forth.

HANGING STEPS OF MILL SPINDLES—By Gideon Hotchkiss, of Windsor, N. Y.—I claim the manner of connecting the tram-block foundation with the stone bearers, by means of stanchions and screw bolts, as specified, in combination with the method of suspending the lighter lever from the shell, which guides and sustains the pot containing the step of the spindle by means of the shell, the sway bar, and the knife edges of the sway bar and pot, or their equivalents, in the manner and for the purpose substantially as described.

[We are glad to see Mr. Hotchkiss still in the field of invention, after his severe accident on the New York and Erie Railroad last year.

BEDSTEAD FASTENINGS—By Jasper Johnson, of Geneseo, N. Y.: I do not claim a bedstead fastening composed of a stub bolt, drawn tight on an inclined plane, as that is well known; but I claim the combination of the fastening, composed of the stub bolt, and the inclined plane, or their equivalents, drawn tight by the cording of the bedstead, with the endless screw, acting upon the inclined plane by means of cogs, or other equivalent device, in order, by turning the inclined plane under the bolt, to loosen, separate, or tighten again, the fastening, without the necessity of slacking the cording.

MOULDING HOLLOW WARE, Etc.—By J. J. Johnston, of Cincinnati, O.: I claim the moulding hollow ware or other similar castings, with a flaring rim, or its equivalent, such as the lip of a cannon, stove or other tubular castings, by using third patterns, attached to suitable match plates or hollow boards, and so devised that, in connection with the first and second patterns, which form the exterior, I mould therefrom the top edge, a portion of the interior of the desired casting, and a true seat for the core, thus, with the core, forming the entire mould, substantially as described.

METHOD OF HEATING SHEET IRON, WHILE IN THE PROCESS OF MANUFACTURE—By Henry McCarty, of Pittsburg, Pa.: having described my improvement in the manufacture of sheet iron, by which it is made to resemble the imported Russia sheet-iron, and possess that beautiful mottled gloss and smooth hard surface:

I claim heating the sheets of iron in a bath of hot lead, instead of heating them in an oven, by which the surfaces of the sheets are protected from the oxygen in the atmosphere, during the heating process, preparatory to the rolling operation.

COMPOUND ANCHOR—By S. N. Miller, of Roxbury Mass.: I claim the anchor, as described, for holding ships.

MIXING MORTAR—By Isaac Peck, of Buffalo, N. Y.: I claim mixing of the lime and sand together, before straining, substantially as set forth.

LOCOMOTIVE ENGINES—By H. R. Remsen & P. M. Hutton, of Troy, N. Y.: We claim the combination in a locomotive engine, of three cylinders whose cranks are at angles of about 120 degs. to each other, with valves, valve chests, escape pipes and steam pipes, provided with throttle valves, substantially such as are described, whereby the steam acts only on one side of the pistons, when the locomotive is advancing, and upon the other, when it is backing, and the reversal is accomplished by such change in the operation of the steam, without recourse to any of the ordinary means of reversal.

SKATES—By N. C. Sandford, of Meriden, Ct.: I claim making the runner out of a plate of steel, and of the form substantially as specified, the plate being turned or struck, the desired form, by means of discs, or in any other desirable way.

BELT CLASP—By A. M. Smith, of Rochester, N. Y.: I claim the making clasps to fasten belts or bands together, to run on machinery or around pulleys, by using jaws or plates of metal, constructing and adapting them to that purpose and then confining them together with screws, so as to hold the belts solid, and thereby introducing a new and useful manner of fastening machine belts together.

METHOD OF RINGING BELLS—By T. V. Stran, of New Albany, Ind.: I claim the combination and arrangement of the levers, C and D, and the compound levers, so connected and attached to the axle as to give motion to the bell clapper, in the manner and for the purpose set forth.

BRICK MACHINES.—R. A. Ver Valen, of Haverstraw, N. Y.: What I claim, is, first, the employment or use of the lever, having step projections, on one of its sides, attached to the connecting rod, and arranged and described, by which a greater or less pressure of the plunger or follower, upon the clay in the moulds is obtained, as desired.

Second, I claim the arrangement of the levers rods, vertical lever, and the rod, O, with the levers, and upright shaft, for the purpose of operating the feeder, and vibrating bar, substantially as set forth.

Third, I claim the employment or use of the spring, attached to the vertical lever, and operated upon by the rods, attached to the lever, whereby the working of the machine is prevented, by any obstruction, as described.

Fourth, I claim the attaching together of the feeder and vibrating bar, the vibrating bar having a guide rod working in suitable bearings, or arranged in any other suitable way.

SOFA BEDSTEADS—By Alfred Walker, of New Haven, Ct.: I claim the manner of guiding the seat when it is raised and lowered, and of connecting the seat and bed, when extended, by means of the metallic bearings and the grooves which they traverse when the seat is raised and lowered.

RAILROAD CARS—By Chas. Waterbury, of Bridgeport, Ct.: I claim an enclosed passage or communication from one car to the other, as described, for the purpose of ventilating the train through the ends of the cars, from the forward part of the train, and for the safety of the passengers, while passing from one car to the other, and for the purpose of keeping dust out of the car, when the train is in motion.

CONNECTING COCKS WITH PIPES—By D. A. Webster, of New York City: ante-dated Dec 29, 1851. I claim the manner described, of making a tight joint, viz., by boring the hole in the pipe, as nearly cylindrical as may be, and making that part of the cock which is to be inserted, near the end and near the shoulder, of equal diameter with the holes, and the central part slightly larger, and then driving the cock into its place, the edges of the hole shaving the cock to its proper size and form.

SUGAR BOILING APPARATUS—By Juan Ramos, of the Island of Porto Rico, (assignor to J. C. Gallaher, of Philadelphia, Pa., & Wm. F. Tirado, of Ponce, Island of Porto Rico). Patented in Spain April 29, 1852: I claim the construction of the transverse canal, in combination with the hinged cover, for the double purpose of returning the froth to the receiving pans, and for preventing the syrup from falling into the canal, while being ladled from one part to the other.

I also claim the construction of the lower longitudinal canal, with its hinged board, for the purpose of more effectually removing the feculencies, as described.

I also claim the use of the movable plank in the coolers, which, when removed, leaves a vacancy or channel for the molasses to flow away to the discharge aperture through the bottom of the cooler.

PROCESSES FOR THE MANUFACTURE OF SUGAR—By Juan Ramos, of the Island of Porto Rico, (assignor to J. C. Gallaher, of Philadelphia, Pa., & W. F. Tirado, of Ponce, Island of Porto Rico.) Patented in Spain April 29, 1851: I claim the use of the plantain stalk and quicklime combined, substantially in the manner and for the purpose described, for defecating the cane juice.

I also claim the application of a fresh strike of concentrated syrup, from the battery to the molasses first drained off, for the purpose of crystallizing the sugar yet remaining in the molasses.

REVOLVING BOOT-HEELS—By Thomas Walker, of Birmingham, England (assignor to B. B. Thayer, of Quincy, Mass.: assignor to W. W. Churchill, of Boston, Mass., & Jos. Baxter, of Quincy, Mass.): patented in England July 18, 1849: I claim the combination of the four separate pieces, that is to say, the metallic ring, the leather or flexible disc, the leather annulus or ring, and the leather disc, the said combination being constructed, arranged, and made to operate together, substantially as described.

DESIGN.

COOKING STOVE—By J. H. Conklin, (assignor to Reuben R. Finch, Senr., and Reuben R. Finch, Jr.,) of Peekskill, N. Y.

[Out of the above number of patents granted, we are happy to say to our friends, that six were obtained through the Agency of this Office.]

To Prepare Yarns for Cord and Rope.

The following process, we have been told, makes improved cord and rope. The yarns, previous to their being made into cord or rope, are steeped in clear lime water, made by stirring one peck of lime in a large hogshead of water, allowing it to settle, and using only the clear liquor. The yarns should be steeped about two hours, then well washed in water, and then steeped in whiting and water, in the proportion of five pounds of whiting to twelve gallons of water. This process, we consider, is too troublesome and expensive for all the benefits it confers, for it merely helps to destroy the natural oil, or the gluten in the yarns. A patent was taken out in England, a few years ago, by a practical man but no chemist, for this process. It would be much better to boil the yarns in clear lime water for four hours, then take them out and wash them but this involves expense and trouble.

New Inductions in Agriculture.

In a number of papers, especially "leading agricultural papers," there have appeared some singular ideas of Dr. Baldwin, of Winchester, Va. He says:—

"It is not true that any plant which the farmer is interested in cultivating, derives its principal nutriment from the carbonic acid gas of the atmosphere. Although air is indispensable to vegetable as well as to animal life."

Nobody doubts this.

"That the only food of plants known to the practical farmer is manure, or the residue of putrefaction. Neither water, oil carbon, phlogiston, nor the sulphates, muriates, silicates, phosphates of soda and potash; nor the alkalies, have ever been proved to be aliment of plants, unconnected with putrefied substances which may contain them."

Some of this is sense, and some not. He talks strangely about phlogiston and putrefaction. What is putrefaction but decomposition? But plants will take up food as liquid manure without the act of decomposition taking place—the act of assimilation operates in the latter case. Again he says:—

"It is not true that different vegetable matters, during their growth, extract different fertilizing salts from the earth. For lands exhausted by continued cultivation in one kind of grain will not produce a more remunerative crop of any other kind."

This part surely contradicts itself, for if lands become exhausted by cultivation, it must be by extracting something from those lands. It is also well known that when some lands become perfectly incapable of bearing one kind of crop by repeated cultivation, they will bear another kind of crop without new manure.

"The residue of the decomposition of vegetable substances, of the 'ash of plants,' is not manure. Nor can manure be made of any substance without the aid of the putrefactive process."

This is not so with respect to clover.—Every farmer knows the advantages derived from *plaster* when sown on clover crops.

"That shade is the great fertilizing agent; the putrefactive fermentation cannot be produced without it; and, consequently, no manures can be made, and no fertility imparted to the earth, in any manner, independent of its influence.

That the earth itself is capable of being converted into the best manures; to effect this, it is only necessary that it should be located favorably for the generation of the putrefactive fermentation.

The difference in the fertility of the soil, in our own native forest lands, arises solely from the circumstance of the surface soil being more or less densely shaded. Pine, which have no leaves, and white and red oak, which part with theirs so reluctantly, never leave the surface soil so fertile as those trees which drop their leaves with the first frosts."

Here, we believe, is the true cause of such views, viz., a mistake in supposing that shade and not the decomposition of the leaves is the cause of the fertility. It would certainly be a clumsy and barbarous method of farming to introduce the shading process as a substitute for manuring and a rotation of crops. The shading of land is a very excellent plan to prevent a too rapid evaporation in warm climates, but shading has nothing to do with the food of plants; it is a mere process or plan to assist in the act of preserving plants or manures from the severe and injurious action of a hot sun. We venture to say that an acre of white sand merely shaded would not become fertile in a thousand years, but let it be manured well, and it will raise good crops. We have noticed only a few of the points set forth as the inductions of Dr. Baldwin. The modern principles of agriculture, viz., rotation of crops and regular manuring, has done more for farmers than Mr. Baldwin seems to be aware of, at least far more than he has given them credit for. Lands which have failed to realize good crops, have become productive when treated with the phosphate of lime without any shade. Plants feed upon that food exactly of which they are themselves composed; the great principles for observation in connection with this fact, is the proper method of their feeding—taking up their food. This is done by the roots drinking up their food in a liquid state, that being its proper state, for which they are adapted upon by their nature and organization.

Patent Cases.

U. S. Circuit Court, New York City. Before Judge Nelson and Betts. The following cases were decided:—The plaintiffs, Tatham and others against Le Roy and Smith, for infringement of a patent for making lead pipe, made an application for a new trial, because the case had been tried before, and a verdict given for the defendants, which the defendants said was not right, as the charge given to the jury in the said case was not correct nor explicit in defining what constituted a new and useful result. The former verdict was set aside and a new trial granted.

Another case was for a similar action—Cornell against Blatchford. A new trial was applied for but denied, and motion for injunction was suspended, until the re-trial of the above.

Brick Machine—Hall against Wilds. A verdict in a former case was given for Hall, and in this case defendant prayed for a new trial. New trial denied.—July 1, 1852.

Substitution of Rosin for Sperm Oil on Machinery.

The running of machinery is attended with immense expense for oil for purposes of lubrication. By a report of a committee appointed by the agents of the Lowell Mills, Mass., to test the relative merits of rosin and sperm oil, that on looms and other machinery of heavy bearings, one-half less power is required with a mixture of rosin with its bulk of pure sperm oil, than with sperm alone, and that its substitution will effect an annual saving of 3-4 of the quantity of sperm oil required in the Lowell Mills. Spinning machinery, or those with light bearings, require more power when rosin and sperm oil is used than sperm alone.

A very good grease for machinery is made by mixing dry quick lime with rosin oil. It makes a kind of soap, very cheap as a lubricating material. Sperm oil seems to maintain its character against all the lubricating compounds which within the past few years have been brought before the public.

Amalgamation of Telegraph Lines

We understand that the New York and Boston Telegraph Line, principally owned by Mr. F. O. J. Smith, and worked under the Morse patent, has been united with the New York and New England Line, better known as the Bain Line, and the united line will hereafter be known as the "New York and New England Union Telegraph Line," and will be managed by John McKinney, who has been long and favorably known as the efficient superintendent of the Bain Line. We also understand that the rates of tariff on despatches between this city and Boston will be raised on and after Monday next, from 10 to 25 cents, for the first 10 words, and 10 cents for each added word.

These lines must look out or there may be some prospects of an independent public line started. There is no patent for a signalling telegraph in this country, and it is totally distinct in principle from all our telegraphs, Prof. Morse has said it is different in principle from his.

High Pressure Steam.

Mr. Perkins, in his experiments on steam, heated a portion of confined steam, not in contact with water, to the temperature of 1400° Fahr., and still the pressure did not exceed five atmospheres (75 lbs. to the square inch); by injecting more water, although the temperature was lowered, the elastic force was gradually increased to one hundred atmospheres (or 1500 lbs. to the square inch), equal to ten times the pressure on any of the boilers of any of the Western steamers, or one hundred times that of any ocean steamer. In the confession of Ryan, the engineer of the ill-fated steamer Glencoe, he states the boiler was dry or nearly so, and as soon as he let in cold water the explosion took place.

TO CORRESPONDENTS.

E. S. P., of N. C.—Your letter, covering sample of ore, has been received, but we have not had an opportunity of thoroughly investigating the matter yet. We think the sample sent is composed principally of pyrites, but it may contain other more valuable miners, which we have not yet discovered.

W. L. B., of Boston—Fifty-two numbers of the Scientific American complete a volume. We can furnish the back numbers of the present volume. You can obtain the numbers at No. 13 Court st.

A. S., of Hartford—You will find a receipt for making varnish on page 107, Vol. 6, Sci. Am.

A. H., of Eng.—We do not think it advisable for you to make an application here on the boiler. The arrangement is slightly different from Montgomery's, and he could prevent you frem using yours in connection with his.

E. E., of N. Y.—The Patent Office does not make original drawings, or attend to answering any questions concerning the novelty of inventions. Many inventors write to the office under an erroneous impression in this respect, and are consequently disappointed in receiving no reply. Correspondence with the Examiners or other subordinates is strictly prohibited.

R. H. G., of Mass.—If a patent has expired before application for extension is made, or if such application be made short of the sixty day's notice now required by law, the Office can afford the inventor no relief. If he desires a renewal of his patent, his remedy is to be found only in a special act of Congress.

G. F. P., of La.—As long ago as 1846 (Vol. 2, page 49, Sci. Am.) we published diagrams of an apparatus for heating and also for ventilating railroad cars, which we should judge from your diagram embraced the whole features of your invention.

T. D., of Ala.—The model of the agitator is received, and will be reported on immediately. You will hear from us by mail.

R. E., of Va.—We are fully aware that the patent in question is not in possession of the original patentee. It was lost to him by prior proof of another inventor, and we have no doubt justice was done.

E. C. L. of Me.—We have high authority for the remarks addressed to you a month since. In a late publication of Liebig he assumes the same position.

J. H. B., of Mich.—We duly received your letter of June 25th. Your subscription we have marked up to No. 26, next volume.

J. H. M., of New Orleans.—We send your package of back numbers per steamer Benjaming Franklin. Your subscription expires now with No. 26, next volume.

A. N. M., of Savannah.—We are unable to state how much a working drawing will cost. Wm. Burden, of Brooklyn, can give you all the required information.

G. F. D., of N. Y.—You certainly had better provide yourself with Borden's Patent Meat Biscuit. You will have 400 per cent. more nutriment in the same bulk by purchasing the article above recommended, than by supplying yourself with any klnd of preserved meats that we know of.

R. S. M., of Mass.—We have not been able to discover the advantages of your machine over Mr. ———'s, but there is no question but what you can obtain a patent notwithstanding.

F. B., of C. W.—We think there has, none of the articles referred to arrived in this country yet, but if you wish us to order some we will instruct our Paris agents to obtain them by your depositing with us the cost, which we believe is about 200f. ($40.)

Money received on account of Patent Office business or the week ending Saturday, July 3:

R. L. & H. W. O., of Ct., $30; D. G., of Vt., $25; D. P. G., of Ind., $20; S. G., of N. Y., $20; T. H. D., of N. H., $70; H. C., of Ky., $40; A. J., of Me., $25.

An Important Paragraph.

Whenever our friends order numbers they have missed—we always send them if we have them on hand. We make this statement to save time and trouble, to which we are subjected in replying when the numbers called for cannot be supplied.

The Post Office Laws do not allow publishers to enclose receipts; when the paper comes regular subscribers may consider their money as received.

Subscribers ordering books or pamphlets are particularly requested to remit sufficient to pay postage.

Back Numbers and Volumes.

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

Of Volumes 1, 2 and 3—none.

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

Of Volume 5, all but 4 numbers, price, in sheets, $1.

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

Of Vol. 7, all back numbers at subscription price.

Patent Claims.

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

Patent Laws, and Guide to Inventors.

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

ADVERTISEMENTS.

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

☞ All advertisements must be paid for before inserting.

SCIENTIFIC MUSEUM.

Lightning Rods for Houses.

As this is the season of the year when thunder storms are frequent, and as lightning has caused many deaths and serious accidents this season, as it does every year, we presume it will not be out of place to say a few words on the subject.

E. Merriam, of Brooklyn City, who has long devoted his attention to electrical phenomena, and the best means of conducting it to the earth, affirms that rods can be put up at very little expense, and that no house should be without a rod. Iron wire of a sufficient size is manufactured at No. 17 Burling Slip, this city, by Messrs. Coöper & Hewitt, which answers every purpose for lighthing conductors. It is put up in rolls of 63 pounds each, and is sold at three and one-fourth cents per pound. A roll contains between four and five hundred feet. This wire is the size used on board of the public ships in the American Navy, and has never in any case failed to protect the ship and all on board from injury by lightning. These rods have never been known to fail, and may be implicitly relied upon. Any person of ordinary capacity can place these rods upon a building. Let the rod project above the chimney and the highest point of the building, and descend to and enter the ground so as to reach permanent moisture. If the rod could be made to terminate in the water of the well, it would be a preferable termination to any other, or in a cess-pool. There should be a rod to each chimney. A barn fifty feet in length should have three rods—one in the middle and one at each end. The rods may be made to diverge, and in that case require but a fastening at the top. These rods require no other pointing than what can be done with a file. Rods should be in one single piece, and not be allowed to come in contact with the spouts, metal gutters, or any metallic body presenting a greater surface than the rod to divert the lightning from its immediate descent to the earth. A lightning rod may be obtained and put up at a cost of fifty cents to a dollar each. They should be secured to the building by some non-conducting substance, such as glass retainers, which are employed on telegraph poles. Copper is a better conductor of electricity than iron, but it is far more expensive. Iron lightning rods should be painted with black paint having little oil in it. Some people have an idea that a rough rod, and one of a square or twisted form is better than a round smooth one. This is not so; a smooth rod is a better conductor than a rough one. The solid section of the rod is the grand object, but at the same time it is asserted by many that very small wires are perfect protectors, especially copper wires.

The insulation must never be overlooked, the conductor should always end in a moist place. If a building is situated on a sandy foundation, it is more subject to be struck by lightning than if it were situated in a wet place; great care must therefore be exercised to conduct the fluid by the conductor to the earth.

How to Apply Guano.

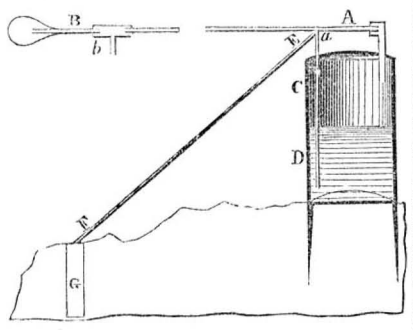
The Editor of the "American Farmer," Baltimore, recommends that every 100 lbs. of guano should be mixed with one peck of plaster and one bushel of salt. The guano is to be moistened and the salt is to be broken very fine along with the guano. This is to be sown over the ground either 100 or 200 lbs. of guano to the acre, and then plowed in. If 25 bushels of leeched ashes be spread over the ground along with this, the land will be so much the better for it.

Camphene.

Accidents from camphene are still very numerous. The Philadelphia papers relate a case of a child who was carrying a lamp with camphene, when it fell, broke in pieces, and the contents flashed at once into flame, burning the child in a most shocking manner. It is dangerous to use camphene in glass lamps, it should not be used where there are children. This we have asserted frequently, and we must do so on every proper occasion. Last week a young woman in Albany, N. Y., and a number of others in the same house, were severely injured by the bursting of a camphene lamp. While such accidents are taking place all the time, it is our duty to speak out on the subject.

Pneumatic Battery for Blasting Rocks.

The accompanying engraving illustrates a new method of blasting, by Thomas Taylor, of 342 Broadway, this city, who read a paper upon the subject at a recent meeting of the Royal Dublin Society, Ireland, and at a distance of about 200 feet ignited three portions of gunpowder simultaneously, upon a signal. He presents it through the columns of the Scientific American, for the benefit of the community, in order to prevent casualties to men engaged in blasting by gunpowder, in quarries and other places, in our country.



A B is a gutta percha tube, of any length required, and of about one-quarter of an inch in diameter; C D is a gutta percha cell, two or three inches square, or it may be round; E F is a gutta percha tube of a syphon form, and removable at *a*. The descending portion is stationary and a fixture; its diameter is about one-eighth of an inch. G is the prepared gunpowder charge. When the miner has arranged all his respective charges (for any number can be ignited simultaneously) by placing a cell at each charge, connected as shown above, ranging between A B, all of which may be easily attached by coupling joints, as at *a*. The tube, like E F, forms a complete syphor, descending near to the bottom of each cell, the *external* end joining G. The cells should be fixed with spikes into the ground. The miner having attended to this, may now remove to a place of safety. On the end of A B is an air bag of gutta percha, the compression of which will force a small portion of sulphuric acid which it contains, through the tubes A B and E F, to G, one drop of which will instantly explode the charge. The miner need not fear an untimely explosion. The connection at *b* will show how other charges may be ignited as connected with the bag, S. A single drop of sulphuric acid will answer to ignite a charge. This method of blasting is offered as a substitute for blasting by a galvanic battery. The air bag is not joined until all the charges are perfectly fixed and arranged, and if the tube, A B, is made with a turned-up mouth at the end, the air bag, S, may be dispensed with. A few drops of sulphuric acid may be poured into the mouth of the tube, and be blown through down into all the charges. The gutta percha tubes do not cost much, and in some cases a knowledge of this pneumatic battery may be of benefit to many persons. One thing must not be forgotten, on the surface of each charge of gunpowder there is placed about one grain of the chlorate of potass, and loaf sugar in fine powder.

To Clean Woolen and Shawls.

Pare and grate raw, mealy potatoes, and put to each pint of the potato pulp a couple of quarts of cold water; let it stand five hours, then strain the water through a seive, and rub as much of the potato pulp as possible—let the strained water stand to settle again—when very clear, turn the water off from the dregs carefully. Put a clean white cotton sheet on a perfectly clean table, lay on the shawl which you wish to clean, and pin it down tight. Dip a sponge that has never been used, in the potato water, and rub the shawl with it till clean, and rinse the shawl in clear water. Spread it on a clean, level place, where it will dry quick—if hung up to dry, the colors are apt to run, and make the shawl streaked. Fold it up while damp, and let it remain half an hour, then put it into a mangler—if you have not one, wrap it in a clean white cloth and let it remain till dry. If there are any grease spots on the shawl they should be extracted before the shawl is washed.—[Ex.

[The above is a curious receipt for washing a shawl. We thought that the taking out grease spots was a washing process, but the above says, "the grease spots should be extracted before the shawl is washed." The potato liquor prepared by the above directions, is merely weak potato starch liquor, no more and no less. There are some kinds of shawls which, if rubbed with a sponge, will forever be rendered unfit to wear. To wash shawls which have many colors in them, is one of the most difficult and intricate processes, especially if there are either blue or green colors in them. To wash a white shawl is an easy matter, the best way to do this is to use very strong soap suds made from white soap, then rinse well in cold water. Fine flowered shawls should always be sent to those who make a profession of shawl cleaning.

Naphtha.

Naphtha, the most fluid bitumen, is nearly colorless, but of a yellowish tinge, transparent, and emits a peculiar odor. It swims on water, its specific gravity being from 0·71 to 0·84. It burns with a bluish-white flame and thick smoke, and leaves no residue. It consists of carbon, 82·2, and hydrogen 14·8; being the only fluid destitute of oxygen. It is found in Persia, in the peninsula of Apcheron, upon the western shore of the Caspian Sea, where it rises through a marly soil in the form of vapor, and, being made to flow through earthen tubes, is inflamed for the purpose of assisting in the preparation of food. It is collected by sinking pits several yards in depth, into which the naphtha flows. It is burned in lamps, by the Persians, instead of oil. Near the village of Amiano, in the State of Parma, there exists a spring, which yields this substance in sufficient quantity to illuminate the city of Genoa, for which purpose it is employed. In a coal mine near Manchester, England, there is a spring of naphtha, welling up between the seams, and which yields 150 gallons a day.

On the surface of Seneca Lake, New York, a large quantity of naphtha, or "rock oil," floats at particular periods of the year. This Seneca rock oil is derived from the bitumen escaping out of the shales which are very carbonaceous in the middle counties of Western New York. The shale beds dip south and a little west under the waters of the lake, and where the opening of the seams meets the water at the bottom of the lake the bitumen oozes out, and rises to the surface. There are many other localities on this continent where native naphtha or bitumen is found. It is found abundantly in Kentucky. Any highly fossiliferous shale, which is dark colored from the large quantity of vegetable matter contained in it, and which also contains pyrites disseminated throughout, generally affords naphtha. Native naphtha boils at 201° Fah.

Artificial naphtha is obtained by the distillation of the crude coal-tar, one of the residues of the manufacture of coal-gas. It has a specific gravity of ·857, and consists of carbon, 83·04; hydrogen 12·31; oxygen, 4·35. Dr. Ure gives the boiling as 316°; but this must have been a very impure naphtha. The chief and valuable agent in coal naphtha is Benzole, which is obtained by distilling the coal-oil at a temperature not exceeding 185°. Coal naphtha is a valuable solvent for many solid hydro-carbons, as gutta percha and caoutchouc and when pure contains no oxygen. On this latter account it is the only substance suitable for preserving potassium and the other easily oxydized metals.

Mr. Lowe, of England, patented a plan for producing illuminating gas, and increasing the power of coal-gas by passing it through naphtha. He charges the gas-meter with naphtha instead of water, and the gas, bubbling through it, becomes charged with the vapor of this hydro-carbon. This is the simplest way, but gas companies objecting, a separate vessel was attached, filled with pieces of sponges, charged with naphtha. This plan was found to act equally well. Gas produces 30 to 50 per cent. more light when naphthalized than when not, and on this account there is a saving of 20 per cent. in gas. It is also more favorable to the human countenance, and to the distinguishment of colors. An inferior gas can thus be made equal to a superior one; and hydrogen passed through naphtha is highly luminous. Carbonic oxide, and even carbonic acid, can be made to burn when naphthalized, and common air burns with a bright flame when fully charged with naphtha vapor.

Glazing Earthenware.

M. Rochinski, a manufacturer of earthenware at Berlin, has found a varnish or glazing for common pottery, which, after trials made in the presence of the College of Medicine, offers no danger to health, and resists the action of the acids. This glazing is composed of five parts of litharge, two parts of well purified clay, and one part of sulphur. These substances are pulverized, mixed with a sufficient quantity of caustic alkáline lye (soapmaker's liquor), so as to form a mixture fit to be readily applied on the earthenware, and to cover it equally all over. Carefully baked, these wares offer no traces of lead.—Exch.

[What becomes of the lead of the litharge, it is an oxide of lead?

Dr. Forbes, in the Quarterly Review, says:—"The crabs in the Kneeling Islands, in the Pacific Ocean, eat cocoanuts, boring a hole through the shell with one of their claws; the fish eat coral, and the dogs hunt fish in the shallow water of the reef; the greater part of the sea-fowl roost on branches, and many of the rats make their nests at the top of high palm trees."

The following recipe will be found exceedingly valuable during the hot months, when there is so much inability to affections of the bowels. Parch half a pint of rice until it is brown; then boil it as rice is usually done. Eat slowly, and it will stop the most alarming cases of diarrhœa.

LITERARY NOTICES.

MACHINERY OF THE NINETEENTH CENTURY—Part 5 of this great work, by G. D. Dempsey, C. E., in London, has just been received, and is for sale by H. Bailliere, 290 Broadway, N. Y. It contains views of Crampton's Patent Locomotive Engine, and of Fairbairn's Rivetting Machine for Boilers. Crampton's Engine and Fairbairn's machine, have obtained a world-wide celebrity; the working drawings of them are of great interest to our engineers.

LITTELL'S LIVING AGE—No. 425 of this most excellent weekly periodical contains a very fine article from "Dicken's Household Words," on Submarine Geography, in which a very high compliment is paid to Lieut. Maury. There is a fine article on "Delta," from Blackwood's Magazine, and a number of other rich, racy, and instructive papers. It is for sale by Dewitt & Davenport, Tribune Buildings, this city.