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## The Temple of Serapis.

M. Auguste Mariette has been, for years past, employed by the French government in making researches in Egypt. Most of his labors have been spent in the excavation of the famous temple of Serapis. A correspondent of the *Journal of Commerce* says:—

"He has completely cleared the Serapeum of the sand under which it lay buried for so many centuries. The fusion of Greek and Egyptian art at various periods is established by a number of statues which were among the images of Serapis. Sculptured representations of Apis were found by the side of statues of Pindar, Homer, Lycurgus, Pythagoras, Plato, and Euripides. An alley or avenue of six hundred sphynxes is terminated by a series of figures representing the principal Hellenic divinities—genii placed, in the Egyptian manner, or animals that symbolize those divinities. The most important of M. Mariette's discoveries was the tomb of Apis, a monument excavated entirely in live rock. There are a hundred vast chambers, the ensemble of a real subterranean city. They supplied the discoverer with a multitude of *steles* (monoliths, statuettes, images of all dimensions and of every age) deposited by the ancient Egyptians in the chambers and compartments of the funereal structure, as tokens of their pious devotion to the mummy of the god worshipped at Memphis.—There are epitaphs forming a chronological record of the Apis buried in the common tomb. The sculpture is of the date of the pyramids, and the statues are in the best state of preservation; the colors are perfectly bright; altogether the execution is admirable, and they convey an exact idea of the physical character of the primitive population."

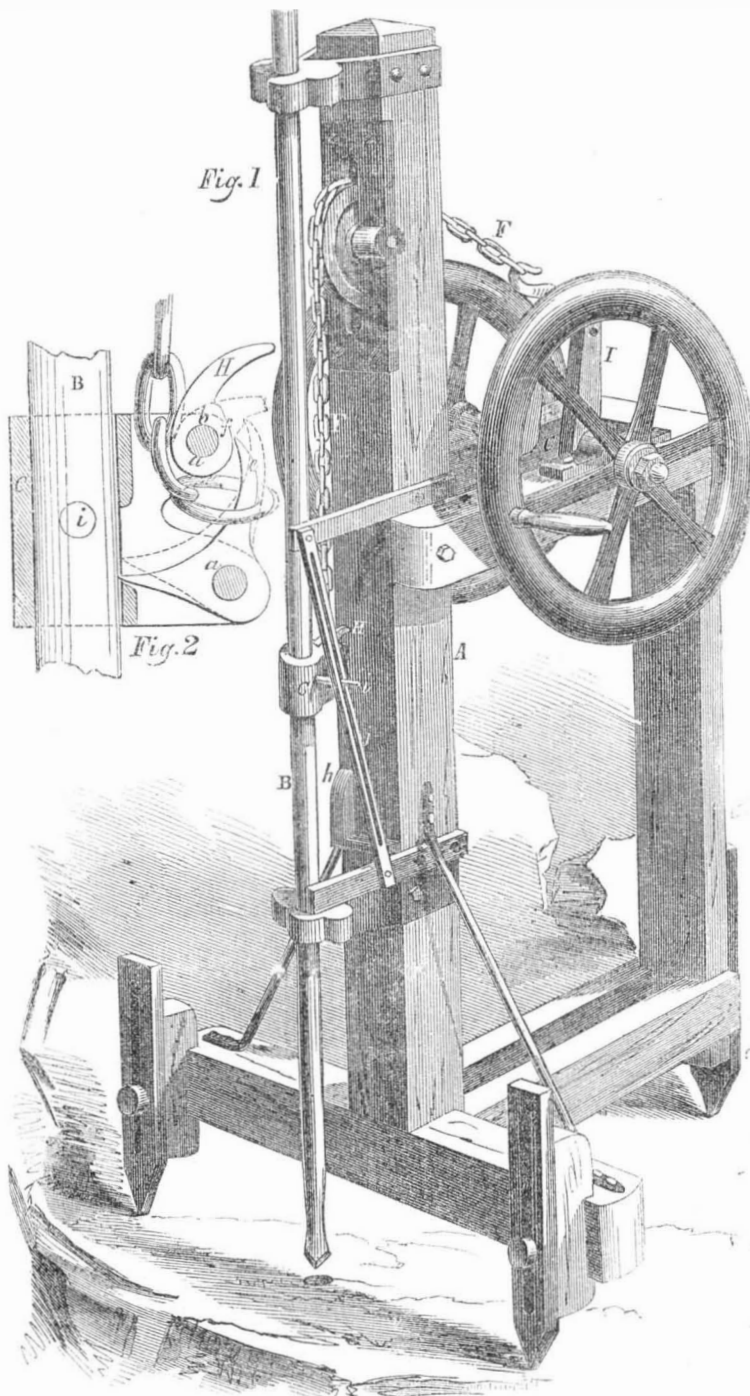
## To Give a Dull Black Color to Brass.

A dull black color, such as is frequently employed for optical instruments may be given to brass by first carefully rubbing the object with tripoli, then washing it with a very dilute solution of a mixture of one part neutral nitrate of tin and two parts of chloride of gold, and then wiping off the excess of liquid, after the lapse of ten minutes, with a wet cloth. If there has been no excess of acid, the surface of the metal will have assumed a dull black color. The neutral nitrate of tin may be prepared by decomposing the perchloride with ammonia, and dissolving the precipitated oxyd thus obtained in nitric acid.

## New York Mechanics Institute Classes.

We desire to call attention to the classes now being formed in the Mechanics' Institute, this city, advertised last week, the terms are within the reach of every young man who desires practical instruction in important mechanical and artistical branches, such as cannot be obtained elsewhere but at a heavy cost. Every mechanic should learn to be a good draughtsman.

## MACHINE FOR DRILLING STONE.



The annexed figures represent an improvement in machinery for drilling stones, for which a patent was granted to Ferdinand Davison, M. D., of Petersburg, Va., on the 7th of last November.

Figure 1 is a perspective view, and figure 2 is a vertical enlarged section of the catch block, by which the drill is attached to the machinery for raising it. Similar letters refer to like parts.

This invention consists in a new and improved combination of parts for the purpose of catching hold of the drill bar or drill, to attach it to the machinery by which it is lifted or drawn back, and of setting it free therefrom, to enable it to strike the blow, either by the force of its own gravity or by force applied by springs or their equivalents properly arranged and attached for the purpose.

A is a framing of proper strength and proportions to receive a drill bar, B, which is arranged in suitable guides. The drill bar is furnished with a catch block, C, of cast, or wrought iron, which is capable of sliding freely or turning on the drill bar. This catch block is slotted on one side to receive a dog, which is pivoted to it by a pin, a, connected at its tail, e, with a chain, F, which passes over a pulley at the top of the machine, and

connects with a crank, I, on the driving shaft, G. This chain, by passing round a proper guide in the catch block, is made to act in such a way that when the dog is not under other control, the weight of the catch block draws the dog toward it, and makes it bite the drill bar, whose own weight further tightens the bite to enable the bar to be raised by the revolution of the crank. Above the slot in which the dog works, is placed a trigger, H, which works on a pin, b, between two ears in the catch block. One part of this trigger serves as a guide to the chain, F, and another part has an eccentric face, which works inside the tail of the dog and in contact with the said tail, which is slightly bent at the end to enter a notch, f, above the eccentric. When the catch block is being drawn upwards the tail of the dog is in contact with the face below the more eccentric part, and is made to hold the trigger stationary; but just before the upward motion of the catch block terminates, the trigger comes in contact, as shown in fig. 2, with the upper part of the framing, A, or with some fixture attached thereto, and a very slightly continued upward motion serves to move the more eccentric part of its face into contact with the tail of the dog, and throw it back far enough to set free the drill, which

then falls. The catch block ascends far enough after setting free the drill bar to bring the tail of the dog into the notch, f. During nearly the whole time of the descent of the catch bar, which is lowered by the ascent of the crank to which the chain is connected, the trigger, by reason of its weight, holds the dog free of the drill bar, but just before the descent terminates, the trigger comes in contact with a fixed stop, h, on the lower part of the framing, and the remainder of the downward motion is sufficient to release the tail of the dog from the notch, and throw up the trigger far enough to bring the lower or least part of its face opposite the tail of the dog, and thus leave the dog entirely under control of the chain, E, when the catch block ascends.

The whole of the working parts of the machine are actuated by the revolution of the crank shaft, G, and consequent raising and lowering of the catch block, by means of the chain connected with the dogs.

The turning of each drill bar is effected by means of a stud, i, attached to its catch block, and working in an oblique guide, j, secured permanently to the framing. The drills being set entirely free every time they strike, are self-feeding.

The invention is applicable to work the drill horizontally, or in any other direction, but when the position is such that the gravity of the bar will not act to give force to the blow, it will be necessary to apply springs or equivalent devices for that purpose, and also to apply a spring or equivalent to the catch block, to return it after drawing back the bar. Any number of drills may be operated in one machine by duplicating these parts.

The claim consists in the peculiar device for clamping and releasing the drill or drill bars; consisting of the dog to which the chain or its equivalent is attached, and the trigger, H, for locking and unlocking the same on the drill bar, said dog and trigger being constructed, combined, and arranged within the catch block, C, substantially as described, so that the latter locks the former at the termination of the descent of the catch block, and unlocks it at the termination of the ascent thereof, by striking some parts of the framing of the machine, or certain fixtures provided for the purpose.

The eccentric dog for catching and holding the drill to be lifted, and the slot, j, with the pin, i, for turning the drill, are very simple and excellent devices for accomplishing the objects specified.

More information may be obtained by letter addressed to Ligon & Davison, Richmond, Va., or Rochester, N. Y.

## Coffee.

There is in Berlin, Prussia, a large establishment for the manufacture of coffee from acorns and chickory, the articles being made separately from each other; the chickory is mixed with an equal weight of turnips, to render it sweeter. The acorn coffee, which is made from roasted and ground acorns, is sold in large quantities and frequently with rather a medicinal than an economical view, as it is thought to have a wholesome effect upon the blood, particularly of scrofulous persons.—[Philadelphia Ledger.]

## A Blue Rose.

The horticulturists of Paris, it is said, have succeeded by artificial crossings in obtaining a natural rose of blue color, which is the fourth color obtained by artificial means—that and the yellow or tea rose, the black or purple rose, and the striped rose being all inventions, and the result of skillful and scientific gardening.

**The Art of Dyeing—No. 4.**

**RED ON WOOL**—In ancient times Tyre was famous for dyeing purple on fine wool. So expensive was this color that it was worn only by kings. The accounts of it are somewhat fabulous; Pliny describes it as obtained from a certain species of shell-fish named "Murex." In the reign of Augustus, one pound of fine wool dyed of the richest blood-red hue was valued at about \$160. This method of dyeing red on wool is now unknown.

Next to the Tyrian purple was the "Kermes Red," so called from the insect with which it was dyed. It was known to the Greeks and Romans. It was found on a small species of oak growing in most of the southern parts of Europe. The wool for this dye being well cleaned was prepared by boiling one hour in a solution of alum and coarse tartar—the quantity of alum was one-fifth that of the wool, and the tartar one-half that of the alum. It was allowed to steep in this liquor for three days, then taken out, washed, dripped, and dyed by boiling it for one hour in a bath of ground kermes, of twelve ounces to the pound of wool. It was then washed and dried. Kermes red was very permanent, but is now unknown in the arts; cochineal and lac have entirely superseded it.

**COCHINEAL**—The most beautiful of all red colors is that produced by cochineal—the *occus cacti* of Mexico. These insects feed on the cactus plant, and are cultivated by the natives of Honduras—where the finest grow—simply as a dye drug. They are swept off with feathers into pans of hot water, and afterwards dried for market. The wool for red being well scoured and washed is introduced into a bath of ground cochineal, and its mordant, and finished at one operation. The wool must be white, the dye kettle must be very clean, and either of copper or tin. To dye five pounds of wool, let seven and a half ounces (1½ to the pound) of ground cochineal be introduced into the kettle, and boiled for five minutes; then introduce ten ounces of cream of tartar and a large wine-glass full of the nitro-muriate of tin; stir all up, and introduce the wool, handling it neatly and rapidly. Allow it to boil for three quarters of an hour, and a good full color may be expected. This is the most beautiful red dye in the world, and the most easy and simple to dye. It is dearer, however, than the *Lac*. This is the product of an insect, a native of the East Indies. There are different kinds of it, that used for dyeing is prepared for this purpose. About four ounces of lac (some kinds require six) are employed to dye one pound of wool. It is prepared for dyeing by steeping it (the lac) for twenty-four hours in strong hydrochloric acid, stirring it from time to time, and then dyeing in a bath the same as cochineal. It is a cheaper and more common but much inferior color to cochineal. All goods that are dyed with spirits of any kind, or acids, must be well washed before they are dried.

**SCARLET**—A little yellow oak bark liquor added to the cochineal or the lac bath, makes the color a scarlet, instead of a red; that is, it forms a binary color composed of the red and yellow rays—the red predominating.

The proportions of dye stuffs given will answer for yarn; cloth requires less, but there is also a great difference in the quality of the wool. The coarser the wool, the more dye stuffs are required, and vice versa. One ounce of the best cochineal will dye a very good color on a pound of fine merino wool.

**MADDER RED**—This color has been long and pretty generally known among our country folks. To dye one pound of yarn or flannel, three ounces of alum and one of the cream of tartar, are the proportions for every pound. To dye five pounds of flannel take one pound of alum, and five ounces of cream of tartar, and after they are dissolved in water in a clean brass or copper kettle, enter the flannel loosely, and keep poking it down under the liquor, and gently raising it from the bottom, and boiling for about one hour and a half. Take it out, hang it up, and air it for fifteen minutes, and then wash it well in cold water. The kettle being emptied and filled with clear

water, into which two and a half pounds of good ground crop madder, (well broken and mixed in a little cold water previously) have been introduced. Warm up this to such a heat as the hand will bear, introduce the flannel, and bring it up to a scalding heat, taking about half an hour to do so, then keep it at this heat for another half hour, and boil for ten minutes. It is then lifted and aired, and about a quart of clear lime water introduced and stirred in the liquor, when the flannel is again entered, and handled for ten minutes. It should then be a good rosy red. Care must be taken to get good madder.

A very excellent plan for *bleeding* the madder, as it is termed, is to steep the quantity intended to be used in dyeing, over night, in a clear decoction of bran—about two pounds of bran should be used for every one of madder, in about two gallons of water.

**NICARAGUA RED**—This is the most fugitive of reds on wool, because it will not stand washing so well as the others described; it is, however, easily dyed, and on fine wool is a very rich and pretty color. The wool is prepared in the same manner as for madder (flannel should never be dyed with this stuff,) and then in a clean liquor of boiled Nicaragua chips at the rate of half a pound to the pound of wool, which is introduced into a clean copper kettle, brought to a boil, the wool entered and handled well for three quarters of an hour, after which it may be taken out, washed and dripped, and is ready for drying. If Brazil wood is used, six ounces to the pound will answer. Both Brazil wood and Nicaragua dye woods should be boiled up to a strong liquor, and kept standing in a vat for use. It is a fact well known to dyers that such liquors make more beautiful colors than if used at once from boiled chips.

Nicaragua red can also be dyed at one operation like cochineal red, by using only about two ounces of alum to the pound of wool, but using more dyewood. Where time is of the most consequence, this plan should be pursued.

All these red colors on woolen goods are easy to manage, if the goods be clean. The madder red is the most troublesome on account of the difficulty in detecting bad stuff. All deep dull reds on merino twilled cloth are dyed with Brazil wood; the bright reds of tartans (woolen checks) are generally dyed with lac; and the very brightest with cochineal. Madder is seldom used for dyeing red in the workshop, although it is the most permanent color.

The discovery of dyeing red and scarlet on wool and silk with cochineal, and a base of tin dissolved in acid is attributed to a Dutch chemist—a Hollander—named Cornelius Drebel; this was in 1630. It was a grand discovery, for it is the most brilliant of all colors. It was termed "Dutch scarlet" for many years after his discovery. It is to be regretted that cochineal is so expensive, being about two dollars per pound, but its cultivation is troublesome. We have been told that those *peans* in Mexico who gather it, are sad looking objects during such labor. Their faces and hands get scratched with the cactus, and then break out into fearful looking sores.

We will describe the methods of dyeing red on silk, in our next.

**Curiosities of Nature.**

In an interesting letter to the *New York Courier and Enquirer*, Mr. E. Meriam states that there is in Lockport, N. Y., an artesian well four hundred and fifty feet in depth, from the bottom of which rises a vein of salt water, holding in combination a large percentage of diluquescent chlorides, which, mingling with waters of other veins, produce instantaneous crystallizations of beautiful *syenite*, in flattened eight-sided prisms of about an inch in length, an eighth of an inch in width, and a sixteenth of an inch in thickness. The laminae of these are so perfect that a single crystal may be divided by means of heat, into two dozen distinct sheets. This well is peculiar in more respects than one. It is accustomed to spout salt water for but a few moments at a time, and then subsiding remains quiet for the space of an

hour, at the conclusion of which it again begins to puff and roar, and shoot forth its saline jets. When the workmen were sinking this well, the auger, upon attaining a depth of two hundred and thirty-five feet, fell suddenly about fourteen feet, and reached the bottom of a subterranean river, flowing with so strong a current as to produce a perceptible motion in the upper part of the stem of the auger.

**Experiments in Stopping Railway Trains.**

Some experiments were recently made on the Brighton and South Eastern Railway, England, by Captain Tyler, for the purpose of ascertaining in how short a period and distance a railway train could be stopped. Two trains were made up, one by the Brighton Company, and the other by the South Eastern, and laden respectively with about 32 tons of iron and other materials, fairly distributed over the carriages, that being calculated to be about the weight of 450 passengers. In order that these trials might have as much similarity as possible to an ordinary case of driving a train, the men in charge of the trains were not allowed to pull up from the first instant the distance or semaphore signal caught their eye, but at an arbitrary given signal, indicated by Captain Tyler himself, at a moment when they might not be expecting it.

Four trips were made between the junction of the two lines. The first was a South Eastern train, and driven by men in the employ of that Company. It started, and, when traveling at the rate of 53 1-2 miles an hour, Captain Tyler gave the signal to stop, and the train was brought to a stand at a distance of 2,077 yards from the point where the signal was given, and that simply by the driver shutting off his steam and the guard applying the two breaks attached to his van, without the engine having been reversed. The second experiment was with a Brighton train, driven by Brighton men. The last mile was run in 66 1-2 seconds, or at the rate of about 54 miles an hour, and the train was pulled up in 1,832 yards after being signalled to stop, by shutting off the steam, applying two breaks, and without reversing the engine, or in less space by 245 yards than the preceding train. The third trial was conducted with a South Eastern train, and by a driver and fireman belonging to that Company, and the object of it was to ascertain in what distance it could be stopped by the application of the same means, and added to them, the immediate reversal of the engine after the signal to stop. The result was, that the train, while going a mile in 66 seconds, was brought up at the distance of 1,790 yards, or in two minutes; but seven seconds were lost in the application of the breaks by the driver not sounding his whistle until after he had reversed his engine. The fourth and last experiment was with a Brighton train and Brighton men, and, by arrangement, every available means was employed to stop on being signalled—namely, reversing the engines, shutting off the steam, applying the breaks, and causing the engine to scatter sand along the rails. The effect of all this was, that the train, while traveling at the rate of a mile in 63 seconds, was pulled up in a minute and a half after the signal, and in the distance of 1,389 yards; thus showing that the application of the sand has a most important influence to stop trains in an emergency, and to this our engineers would do well to take heed.

**Telegraph to the Pacific.**

The Committee on Territories, in the House, has reported the Senate Bill for the construction of a subterranean telegraph from some point on the Mississippi river to the Pacific Ocean, at San Francisco. The committee in their report say that the Bill is of transcendent public concern, and possesses the merit of practicability and early completion, if it can have the encouragement of the government. It provides for right of way through the public lands, and that it shall be constructed by individual enterprise and at individual expense. The government are to have free use of the line to the extent of 8,000 words per month, in consideration of

which two millions of acres of land in alternate sections along the line, are to be donated to the parties building the telegraph.

**Railways of the United States.**

The United States are now ahead of the world in the railway movement, and from what has been done we may justly look forward with hope and pride to the future. The following is a comparative statement of the railways of the United States on January 1st, of four years stated:—

Miles in operation:—1852, 11,565; 1853, 13,847; 1854, 17,811; 1855, 21,310. Miles in construction:—1852, 11,228; 1853, 10,418; 1854, 12,898; 1855, 16,975. Capital invested:—1852, \$385,150,848; 1853, 408,103,109; 1854, 508,588,038; 1855, 621,316,303.

The items in our present annual statement have been mostly based on the reports of the companies, but when these have not been accessible, the information has been obtained from the local press, and from other sources. The total amount of capital invested in railways we think is vastly understated. There were 3,599 miles opened last year.

Had the stringent money market given way, and capital become more easy and plenty, there would no doubt have been some two thousand more miles of railway finished during the past year. Perhaps it is well as it is, but there can be no doubt that railway construction will be much diminished during the next two or three years. Railway shares and other securities are now in bad odor throughout the country, and nothing will bring them up again but a long course of rigid economy in management, and a partial cessation of demand for capital to construct new enterprises. The roads built during the past year have labored under disadvantages of no common character, and the only surprise we can express is, that so much should have been done under such unpropitious circumstances. We hope that at the end of the present year railway property will stand in a stronger position than it now does, and that the really valuable property will be properly regarded by those most interested.—[*American Railway Times*, Boston.]

**The Minie Ball.**

The *Cleveland Herald* is informed that the manufacture of muskets in our armories is abandoned, and our men will be armed with improved Minie rifles with bayonets. The Minie ball is now to be manufactured upon an improved plan. As now used in the Crimea, the powder drives the sheet iron cup into the cavity of the ball, and this spreads the ball so as to perfectly slug or fill the rifled bore of the gun. The improvement is to dispense with this sheet iron cup and make the powder do all the work of spreading the ball.—Our army will use the Minie ball without the cup. A portion or the whole of the charge of the powder is inserted into the cavity of the ball, and powder and ball made into a cartridge. The explosion of the powder in this cavity does the whole work of spreading the ball and driving it on its mission of death. Another improvement in the manufacture of balls in our service, is that of cutting them out of sheet lead instead of running them. These are termed pressed balls, and possess a much more uniform density—hence more true in their flight towards the object aimed at.—[*New England Farmer*.]

[How can "our army use the Minie ball without the cup?" In that case it will not be the Minie ball. If it is meant by the above that part of the charge is to be placed in a hole in the butt of the ball, as a substitute for the Minie iron capsule to spread the lead in the barrel, then, it will be found a very inferior plan.]

**St. Paul, Minnesota.**

The above named place must contain a very enterprising and intelligent population. The *St. Paul Daily Times*, which we receive regularly, is a handsome, spirited, and able paper.

In England and Wales there are 5,897 miles of railways in operation.

(For the Scientific American.)  
Ventilation and Sewers.

The scheme propounded by Mr. Nasmyth, in a letter to the London *Times*, and noticed in the *SCIENTIFIC AMERICAN* a few weeks since, under the head of "Ventilation of Sewers," is a step in the right direction, and I am happy to perceive that this subject has at last attracted the attention of scientific men. I have not a doubt that sewers are a most prolific source of disease in cities and towns.

Mr. Nasmyth's plan is good as far as it goes. He has evidently a glimmering of the true principle, but I apprehend that the quantity of effluvia for the combustion of fuel for all the steam engines in connection with lofty chimneys, in any city, would fall far short of rendering our sewers innocuous.

Let every dwelling in a city be properly ventilated, and there would be no further use for sewers than to carry off the surplus water from our buildings, and rain water from the streets. Every building should have its "foul air shaft." Let us get in the way of building our chimneys for air as well as smoke, and let us once understand that our cellars require more ventilation than any other apartments in our dwellings, and that the most important flues in the chimney are those which connect with the bottom of the cellar and our water closets, and then more than half the work will be done. We should thus get rid at once of the principal part of the noxious effluvia of a whole city—in detail; and by the well known law of the diffusion of gases, all evil effects from this source prevented. No water closet should ever be permitted to be drained into a sewer unless that sewer be thoroughly ventilated—then only can it be done with impunity.

It is quite a mistake to suppose that our sewers as now managed carry off the mephitic air generated in our dwellings.

Let us look at the actual state of things once boldly in the face, and a remedy will be found, but as long as we allow ourselves to be deceived by appearances, so long will most of our sanitary measures prove abortive. Whilst we see the waste water run freely into our drains, we sit down quite contentedly—the noxious gases coming up them is not perceived.

What, then, is the plain matter of fact? Every building is drained into these sewers; the consequence is, that these drains having no connection with any chimney or flue, the whole building becomes a "foul air shaft" for the sewer. By the rarefaction of the air, and the natural draft of chimneys, there is a constant draft up these drains, and into and throughout dwellings. To make the matter worse, (as the mouths of sewers are generally left open) whenever the wind blows in a direction up the sewer, the malaria is blown out in ten-fold quantity.

But properly managed, these sewers might be turned to good account in the ventilation of a whole city upon the same principle that I would ventilate a house, viz., by erecting a foul air shaft near the mouth, which mouth should always be under water, so as to exclude all the external air. All the miasm would thus be drawn down the sewer, and, of course, down every drain, and thus, with very little trouble and expense, a whole city may be ventilated. Properly constructed, nothing could be more certain than the operation of such a shaft. The height would somewhat depend upon its locality—but the higher the better, and if properly formed and connected with the sewer, its work would be prodigious, and without any further expense than to keep it in order. Let this be tried in one of your most unhealthy localities.

HENRY RUTTAN.

Coburg, Canada, January 1855.

(For the Scientific American.)  
Olive Oil for Snake Bites.

Some months since you published interesting articles on the subject of poisonous snake bites, I concur in the opinion you expressed that the best known remedy for such a sedative poison is whiskey or other alcoholic stimulant—drank to intoxication in most cases.

Another remedy:—Apply (when practicable) around the wounded limb a ligature to retard the flow of the poison with the blood towards the heart, give the patient a table spoonful of pure olive oil every half hour until relieved, commencing as soon as possible after the infliction of the bite; at the same time oil is to be rubbed on and about the surface wounded. An intelligent physician informs me that during his residence on the Brazos River for many years, he used this remedy with uniform success. During one year five or six of his own slaves were bitten by what he believes to have been poisonous serpents, such as moccasins, rattlesnakes, cotton-mouths, &c., and were promptly relieved by the olive oil. The toe of a negro girl bitten by a cotton-mouth serpent, (such is the popular name) sloughed off the day after the bite—the olive oil relieved her. In short, he says he has never known the remedy to fail. I give the information for what it is worth. Let the unfortunate try it, if no better remedy is at hand.

LACON

Galveston, Texas.

(For the Scientific American.)

Barometer and Cannonading.

Chas. Le Maout has communicated to the French Minister of War the discovery that a heavy cannonade affects the barometer at the distance of fifteen hundred miles. That would seem to be a very natural consequence. The atmosphere is a very elastic mobile body.—The concussion caused by a four pounder sways a balloon a mile above the earth, and several miles off. Even the beating of a large drum produces an atmospheric wave, at a considerable height and distance. I have frequently noticed this while sailing in the air.

The cannonading at the battle of Balaklava, or Inkerman, must have produced immense atmospheric waves. The direction of concussion would be upward and laterally, increasing the wave as it went. This followed by another, and another, and so on, by successive discharges of batteries, augmenting the first by each successive wave, would soon put an immense body of atmosphere in motion; and this body rolling along would press the mercury in the barometer over which it passed, and cause it to rise.

I have ascended when the air was calm on the earth, and on reaching an altitude of eight to ten thousand feet, found an atmospheric wave that undulated along at the rate of over a mile per minute. These undulations were so great as to be observable by the increase and diminution of objects to the sight on the surface of the earth, from the balloon's approach to it and recession. And these effects were enhanced in crossing mountain ridges and valleys.

The atmosphere always moves in waves, whatever may put it in motion. Suddenly generated waves are most disastrous, though of short duration. They capsize ships, unroof buildings, and desolate fields. The depression, being sudden, is as quickly relieved, and in the re-action of the wave causes the unroofing of buildings and uprooting of trees. In this instance we have, first, compression, followed quickly by dilation. Hence, buildings burst outwards in tornadoes, and roofs fly upwards. It is always the effect of re-action, because that has no solid obstruction as is the case in action, where the solid earth under the building and the ordinary air with in protects it from collapse.

Le Maout's philosophy on this subject is sustained by reason and observation. If a file of soldiers march across a suspension bridge in "mark time" order, it will produce an augmenting wave on it. If this be followed by another file in corresponding order, and still another, I would not answer for the best suspension bridge in the country, though a thousand heads of oxen had gone over it with impunity and safety. Again, in pulling down a wall or a tree with a rope, fifty men may pull their utmost in a continuous strain and not bring it down, while ten men may accomplish its downfall by undulating impulse upon impulse until the accu-

mulated force of a hundred waves topple it over.

The first discharge of a battery at Inkerman produced concussion in the immediate surrounding atmosphere. The next discharge followed it, overtook it, and increased it,—this went on for eight hours. Truly an immense atmospheric wave was propagated; and once propagated and in motion, it must, indeed, have fluctuated the barometer for a great distance from the place of cannonading.

JOHN WISE.

Lancaster, Pa., Jan. 6th, 1855.

Coating Wire Fences.

MESSRS. EDITORS—In your last paper, speaking of wire fences, you recommend them to be coated with coal tar. In the *National Telegraph Review* for July, 1853 (Philadelphia,) page 116, 117, is an account of the application of coal tar to a telegraph line, which ends with, "Well, the tar was on, but it would not do. The pyrolygneous acid it contained commenced a war on the wire. Instead of proving a preservative it proved a destroyer, and thus the days of tar were ended." Further on, is the passage, "The simplest coating, and perhaps the best which can be used, of an unconducting character, is by first allowing the wire to rust, and then coating it with boiled linseed oil. A paint of the oxyd of iron is thus formed, simple, cheap, permanent, and with the merit of an easy application." W. M. S.

[We never heard before of coal tar containing pyrolygneous acid; wood tar contains some, but not coal tar. It is true, however that the boiled linseed oil applied to wire slightly rusted, makes an excellent coating, as recommended by our correspondent. We recommended a mixture of coal tar and oil.

A Forthcoming Wonder.

According to a correspondent of *Hera-path's (English) Journal*, steam power is to be superseded by "Poulson's Patent Pendulum T-Lever," which will be brought before the public in about a month. Two men, in a sitting position, will be able with ease to propel a railway engine of twenty-five horse power, with its full complement of carriages, at any speed attainable by steam power. The tenders and boilers of the present engines will be no longer required, and the new engines will be constructed of about one-fourth the weight, and say, at one-sixth or one-eighth the cost. The wheels and frames of the present engines will be available for the new ones.

Is the above a humbug or not? H.

[The above is scarcely a humbug; it is too transparently contradictory for that, and is no doubt somewhat waggish. Just fancy two men (as stated in the paragraph) in a sitting position, propelling a railway engine of twenty-five horse power. Our correspondent may safely set down all those discoveries of gaining power from a lever, as humbugs. There is no power in a lever; it is merely a device for communicating the force of the active agent—man, horse, steam, or water.

Artificial Whalebone.

Compte Van der Meere's patent for softening horn and rendering it elastic like whalebone:—The horns are cleansed, split, opened out and flattened, and immersed for several days in a bath composed of 5 parts of glycerine to 100 parts of water. They are then placed in a second bath, consisting of 3 quarts of nitric acid, 2 quarts of pyrolygneous acid, 12½ lbs. tannin, 5 lbs. bi-tartrate of potash, and 5 lbs. sulphate of zinc, with 25 gallons of water. After leaving this second bath, it will have acquired a suitable degree of flexibility and elasticity to enable it to be used as a substitute for whalebone for the ribs of umbrellas and other purposes.—[London Artisan.

Improvements in Puddling Iron.

James Nasmyth, of Patricroft, near Manchester, Eng., has recently patented an improved operation in iron manufacture, by subjecting the molten metal in the puddling or refining furnace to the action of a current of steam, introduced at its lower portion, diffusing upwards, and thus mechanically ag-

itating the liquid metal, and exposing fresh surface to the oxygen of the furnace atmosphere, which chemically combines with the carbon and sulphur contained in the iron, and deprives it of those impurities. The hydrogen set free is thus in a state to combine with any excess of sulphur, whether present in the iron, or as a product of the combustion of the fuel.—[Mining Journal.

Effect of Pressure on Substances.

Evan Hopkins and W. Fairbairn, two very distinguished men of practical scientific attainments, have made a number of experiments on different substances, under enormous pressure, and the results they have obtained claim the attention of all engineers, mechanics, and molders. Mr. Fairbairn had submitted some substances to the pressure of 80,000 lbs. on the square inch, a weight equal to a column of water 33 miles in height, and found, that under this enormous pressure clay acquired the density and hardness of stone.

The Lancaster Gun.

Many of our journals, as well as those in England, have endeavored to give the public a true idea of the construction and nature of the above-named gun, which has won so much fame in the Crimea, but we confess to have been amazingly befogged with their descriptions, and must say that a little more reflection would have convinced every one of them who has endeavored to be wise on the subject, that it has been very soft. It has been described by one as the "oval gun," that is, having an oval bore, from which we should infer that it was made for firing off eggs. By another it has been described as having an elliptic bore, from which we should infer that it was useful for shooting eccentrically. How in the name of common sense could a cast-iron ball be rammed down a cannon if it had a conical bore—narrower at the breach than the muzzle? It is impossible. The Lancaster gun is simply a rifled cannon having conical balls cast for it, each with two broad projections to fit into the grooves. A. Jones writing to the *Journal of Commerce* of this city, claims to have invented the Lancaster gun in 1842, but his description shows that he has been led astray by the common accounts which he has read of it. He says:—

"My theory was, that projectiles which moved through the air with the least resistance, were those of a spheroidal form, or which resembled the form of the earth. In other words, that round bodies, or balls projected through the air, had a tendency to dispose the particles of which they were composed into flattened spheroids—that is, a round body put in rapid motion had a tendency to expand in the circumference of its equator, and to contract at its polar axis. To obtain a high range from a cannon fired from heavy ordnance, which was the chief object of my invention, I proposed to make cannon with spheroidal bores, and to cast the balls in the same shape, believing that they would offer less resistance in their transit through the air than common round balls. This theory has since been proven by the Lancaster gun, recently brought out by Mr. Lancaster, who, I learn, is a gunsmith of London. The invention may possibly have been original with him, as, I know, mine was with myself, and in advance of him, or other parties."

Here Mr. Jones is very vague. How could he make cannon with spheroidal bores—that is in plain words, making the chamber of a cannon the same form as its ball. All cannon are now bored for spheroidal balls—a true sphere being a perfect globe with every part of its surface equi-distant from its center, but the bore is not spheroidal. The Lancaster gun, on the contrary, is simply a rifle, with shot cast to suit its bore. Mr. Jones' theory will not apply to rifles, and it is from rifled cannon that the great improvements in such kinds of war engines are to be obtained.

A very interesting patent trial, respecting "S'ckles' Cut Off," has been in progress in this city during the past six days. We will give the particulars in our next.

New Inventions.

Freeing Canal Boats of Water.

The annexed figure represents a transverse section of a plan for freeing canal boats and other vessels from water, for which a patent was granted to Wm. Loughridge, of Weverton, Md., on the 11th of last July.

The invention has for its object the discharge of the leakage from canal boats and other vessels without the employment of pumps. It consists in the peculiar arrangement of a float in the interior of the vessel combined with a tube operating on the siphon principle, by which the discharge is rendered automatic, and the vessel freed from its leakage at all times, without the assistance of the crew, rendering examinations as to the quantity of water made unnecessary, and obviating the necessity for a watch to pump out during the night.

In the figure, *a* represents the boat, and the space between *a* and *a'* the thickness of the bottom planking, in which is inserted a bent tube, *b*, open at one end, *c*, and connected at the other with a metal or gutta percha tube, *d*. The open mouth, *c*, is slightly above the surface of the plank, and has resting upon it a valve, *e*, having on its under surface an elastic pad for giving a perfect contact with the mouth, *c*, of the tube. This valve is securely fastened to a float, *B*, kept in position by means of two arms, *f*, one shown, having perforations in them, which pass over standards, *h*. This float is placed between the ribs, and bottom and floor of the boat, and will rise so as to free the mouth, *c*, of the tube, *b*, on the admission of a very slight depth of water to the hold of the boat by leakage.

The tube is bent around the outer surface of the vessel, *A*, and permitted to terminate at a lower level than the bottom of the boat. If there be a leak in the bottom of the boat, *A*, when a proper depth of water has covered the bottom, the float, *B*, will rise and lift the valve, *e*, from the mouth, *c*, of the tube, *b*, then if the air is exhausted from the tube, *d*, the water will flow from the mouth of the tube, *d*, and the valve continue to fall until the water in the hold is nearly down to the level of the mouth, *c*, of the tube, *b*, when the attraction of the mouth of the tube overcoming the buoyancy of the valve end of the float, *B*, the valve, *e*, drops upon the mouth, *c*, of the tube, before said mouth has become uncovered for the admission of air. A rise of water in the hold sufficient to overcome the attraction of the mouth, *c*, of the tube for the valve, *e*, lifts the float and opens the mouth, *c*, of the tube, *b*, causing the discharge of the water from the lower end of tube, *d*, to be resumed, which discharge will continue until the valve, *e*, again drops on mouth *c*, as before. In this way, when this mode of discharge is once put in operation, a rise of water in the hold, sufficient to lift the float, will produce an immediate discharge from the mouth of the tube, *d*, which will continue until the depth of the water is so reduced that the valve, *e*, drops upon the mouth, *c*, of the tube, *b*, and stops the flow, thus rendering the operation of this water deliverer automatic, and always preventing a rise of water in the hold above that required to cover the mouth, *c*, of the bent tube, *b*.

When the boat is tied up for the night, with the pipe, *d*, the reel is rolled off the deck, permitting the tube to unwind. The reel, *m*, is run down the bank, or any suitable situation given the tube, *d*, which will bring the end, *q*, lower than the bottom of the boat. Air is then expelled from the tube by a small air pump, or by pouring water into the end, *q*, of the tube, or in any suitable manner. The discharge will then begin and continue, as above described, until the valve, *e*, shuts down on the end, *c*, of the tube, *b*. When the water rises in the hold to lift the float, the discharge is resumed and will continue until stopped by the dropping of the valve, *e*, the operation in practice being as explained from figures 1 and 2. The tube, *d*, discharging the leakage whenever the water rises above the floating point of the float, *B*,

without the necessity of any watch, or the interposition of any human agency.

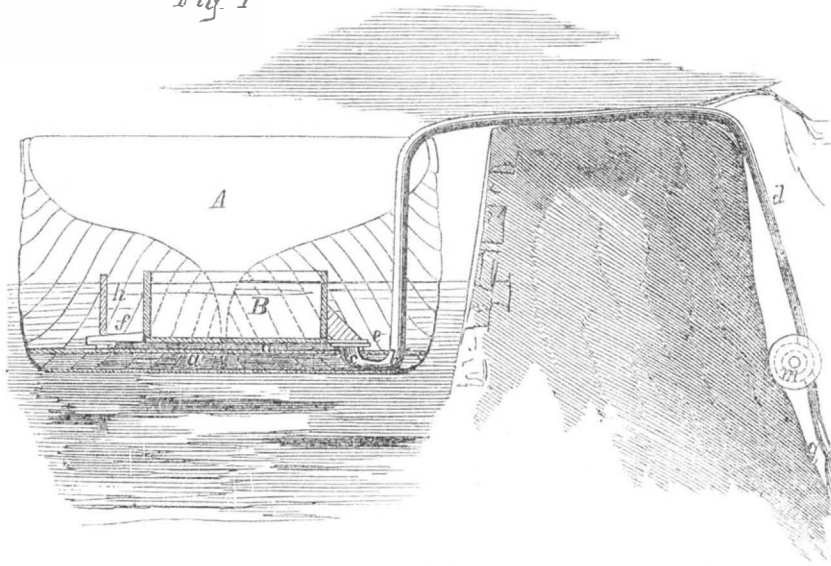
The water discharging arrangement is of the greatest importance on canals, where cargoes are often greatly damaged by negli-

gence on the part of the watch in pumping out the leakage, though it may be rendered available for many other purposes, which require a similar discharging arrangement.

The claim is for the described arrange-

FREEING CANAL BOATS FROM WATER.

Fig. 1



ment of float valve, and bent tube in the bottom of the boat, by which the discharge of water is rendered automatic, and the boat

freed from the leakage.

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

SELF-REGULATING HOT WATER FURNACE.

Fig. 1

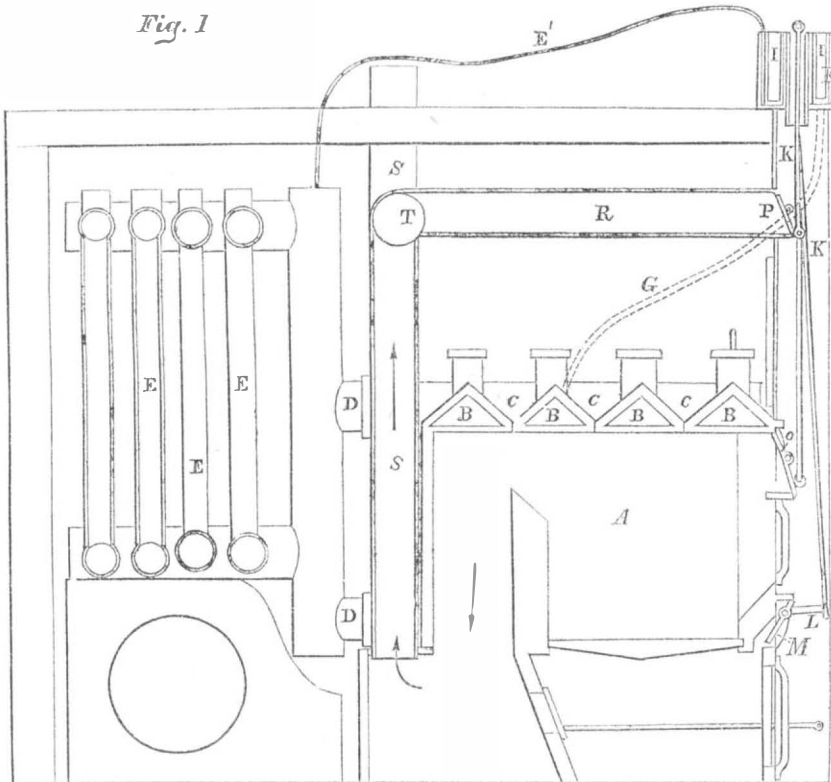
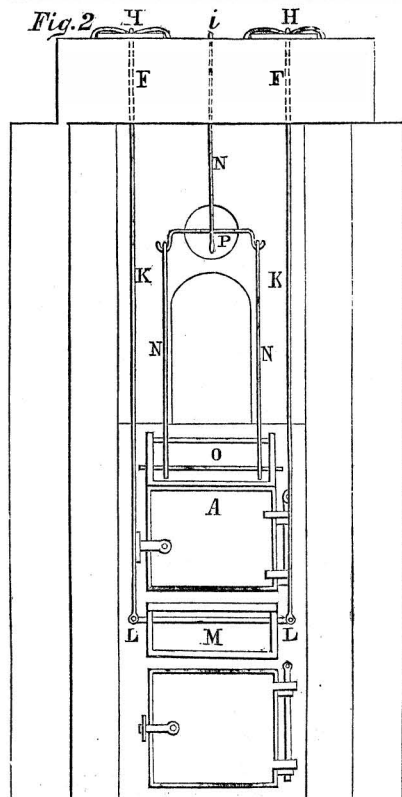


Fig. 2



The annexed figures represent an improvement in hot water furnaces for heating pub-

lic and private buildings, greenhouses, hospitals, &c., for which a patent was granted to Thomas T. Tasker, of Philadelphia, Pa., on the 5th of December last.

Figure 1 is a sectional elevation through the furnace from front to rear, and figure 2 is a front view of the furnace showing the regulator. Similar letters indicate like parts.

The invention consists in a mode of regulating the temperature of furnaces for hot water apparatus by self-acting valves and dampers of a peculiar arrangement. One evil that has been experienced in all hot water arrangements for heating apartments, is the unequal heat and circulation from the variations in the fire from hour to hour and from day to day; and another is the overheating of the water causing it sometimes to boil and generate steam and straining the joints of the tubes by too great expansion. These are effectually guarded against by the arrangements for controlling the draft through the furnace, the construction and operation of which are as follows:—

A is the furnace, the walls of which are composed of tubes, B, of a triangular form in the cross section, and so arranged that by the meeting of their edges as seen at C, the inner surface of the walls are even, and the outer surface presents a zig-zag line in the cross section. These tubes are connected by main tubes, D D, which convey the heated

water to the circulating system of tubes, E E, whence the water is conveyed by pipes, E', to the open vessel, F, and thence down through tubes, G G, to the heaters, B B. In the vessel, F, are three floats, H H and I. To the floats, H H, are connected metallic rods, K K, which take hold of short rods, L L, attached to the draft valve, M; and connected with the float, I, is a rod, N, which takes hold of a valve, O, above the fire, and also hold of a damper, P, placed at the end of the flue, R, which enters the smoke pipe, S, at T. As the temperature of the water in the open vessel, F, rises, it expands and carries up the floats, H H, which through the rods, K K, operate to close the draft valve, M, and check the fire, and the float, I, operates through the rod, N, to open the valve, O, and also the damper P. When fire is thoroughly ignited it is often difficult to check it as quick as necessary by shutting the draft below, and though the admission of a draft of cold air above the fire has a tendency to check it, yet under some circumstances it may for a while increase it, and it is therefore provided for the admission of cold air directly into the smoke flue through damper, P. With these provisions, complete control is obtained over the fire, and this automatic regulation has been found so reliable that where the floats are adjusted for a given temperature, the temperature of the heated air is regular to a degree, as long as a good fire is kept up, and there is no material change in the weather. The floats or rods may be set to give any required temperature by the methods usually employed in pyrometric regulators for stoves, etc. As the expansion and contraction of the water takes place slowly, the action upon the fire is in consequence gradual and not sudden, as in pyrometric arrangements when metallic rods connected with the dampers are expanded by the heat of stoves or fires. The loss of water from the vessel, F, by evaporation is supplied as often as necessary in order to keep the regulators to a uniform action.

The claim is for the arrangement of the two sets of floats operating the valves, M O, and damper, P, and the open vessel, F, in combination with a circulating hot water apparatus, as set forth.

The heating of buildings by hot water is far more healthy than by hot air. Commodore Stockton, T. Kirkbride, M. D., and John Fallon, Esq., Philadelphia, also Dr. Buttolph of the New Jersey Asylum, Trenton, have these furnaces in operation, and have used them for some time with increasing satisfaction.

Mr. Tasker in a letter to us invites the criticism and attention of architects, builders, and citizens to this improvement, and says:—"House warming may now be summed up as follows: make up a fire once a day, (morning) set the regulator by the scale and the furnace will take care of itself and the family into the bargain, until bed time."

The patentee has been engaged for years in manufacturing different kinds of householding apparatus. The firm is Morris, Tasker & Morris, 85 South 3rd street, Philadelphia, where this furnace is sold. The firm is always prepared to estimate for warming of buildings of any size—both churches, hospitals, and private dwellings, and from whom more information may be obtained by letter.

Safety Camphene Lamp.

Wm. Bennet, of Brooklyn, N. Y., has applied for a patent for an improvement in lamps for burning camphene, so as to render them more safe and free from explosions. The nature of the invention consists in having the fluid chamber of the lamp partially or wholly surrounded with water, for the purpose of keeping it cool and preventing it from volatilizing more than is necessary to feed the flame, so that the generating of a great pressure of gas inside of the lamp to burst it, will be prevented. This part has no reference to explosions caused by a mixture of air with the gas, but simply an excess of pressure. This lamp is also so constructed that the fluid can be supplied at its bottom, and thus the danger of fluid coming in contact with the flame of the wick is avoided.

Scientific American.

NEW YORK, JANUARY 20, 1855.

Patent Claims.

The *Railroad Advocate* of the 6th inst., in discussing the claims of Septimus Norris, of Philadelphia, to a ten-wheeled locomotive, uses the following language in reference to the invention of Ross Winans:—

"Another great wrong, we think, is in allowing patentees to claim a mere result, where it may be, perhaps, attained in a dozen different ways, and when the patentee has invented and described but one of these methods. Ross Winans has just issued one of his characteristic circulars announcing the extension of his variable exhaust patent. His patent describes one mode of varying the opening of the exhaust pipes, by which the engineer can regulate the draft of the fire when the engine is in motion. He is, however, allowed to claim every other plan for a like purpose, in other words—the result itself."

Our cotemporary is evidently not acquainted with the principles of our patent laws. Patentees are not allowed to claim a mere result, unless that result is a new manufacture—like a piece of cloth. If it had said "he," Ross Winans, "is allowed to claim every other like plan, for a like purpose," then it would have stated the case correctly; for the means to produce a result are the only patentable features in a machine, not the result itself. If the same result can be produced by a method entirely different, then a patent can be obtained for that method or means, and the patent sustained against Ross Winans or any other person. If the *Railroad Advocate* can do so, it need not fear the result in using the new means. On page 101, this volume, SCIENTIFIC AMERICAN, there is a review of the patent case between the American Pin Co., and the Oakville Co., in which this patent doctrine is clearly stated, based on the decision of the U. S. Supreme Court, in the case of O'Reilly vs. Morse. It says, "any one may lawfully accomplish the same end as that described in a patent without infringing it, if he uses means substantially different." This language will show the *Advocate* that it has entertained wrong views respecting patent claims, and its appeal to the railroad officers appointed at Cleveland to "resist energetically the execution of patents granted upon the principle it has discussed" is unnecessary. We would inform the *Advocate*, however, that a mere change of form in the means to produce a result like that accomplished by Ross Winans, will not avail against the honest and just interpretation of patent law. The means to accomplish the same result may be greatly modified, and yet be the same in principle. Any bungler can make an egg sit on a table after he has been shown the way to do it. The Patent Laws are fair and impartial in deciding upon such matters as questions of infringement. They are left entirely to juries who decide upon opinions expressed by competent witnesses—experts—respecting whether the machine (or machines, or implements) claimed to be an infringement, is in principle like that claimed in the patent said to be infringed. Nothing can be more fair and equitable than this, and we have no doubt but the *Advocate* will, when it comes to reconsider the matter, acknowledge this to be so.

American Wool.

Our daily papers state that all the broadcloth manufactories in our country have stopped operations because they cannot compete with the broadcloth manufacturers of France, Belgium, and Germany. The reason given is, that American wool is excellent for warp, making a hard, strong, woolen yarn for this purpose, but is unsuitable for weft, as it wants that silky softness peculiar to German wool, which must be purchased for this purpose, but on which there is a duty of 30 per cent., which gives great advantages to the German manufacturers. This seems to contradict the statements published in many of

our papers respecting the superior quality of American fine wool, for which the prize was awarded in competition with German wool in 1851, at the London World's Fair. Mr. Ewbank in his new book *The World a Workshop*, states that the clip of wool in the United States in 1850 only amounted to 52,516,959 lbs., while that of Australia amounts to 70,000,000 lbs., and that of England to 120,000,000 lbs. English wool is not used for broadcloth, it is used chiefly for flannels, woolen yarns, and coarse cloths. The Australian, German, and Cape wool are used for broadcloth; the German—being the finest—is used for making the best quality of this cloth. It is our opinion that our farmers residing in the hilly regions of our southern States can raise as fine wool as the German, and as cheap. It cannot be expected that wool can be raised as cheap in the northern States, because sheep require so much in-door feeding during the winter season, but in Tennessee, Missouri, Georgia, and all the hilly regions of our southern States, no housing nor hand feeding is required for sheep in winter.

Safety of Ships.

The great loss of life and property from shipwrecks of various kinds, during the past year, has concentrated much thought upon the best means of obviating such disasters, at least so far as human agency can. A great number of improvements in life boats and ships have been suggested, and no doubt some good will be the result. The first grand object of thought should be directed to improvements in ships themselves, as life boats are but forlorn hopes. Every ship should be made on the life boat principle, that is, divided into a number of water-tight compartments. We have received so many communications on this subject, that it has been impossible for us to give but few of them a place in our columns. The one by "a practical observer," on page 131, suggesting a central longitudinal position on all ships, and then divided into six compartments, by three transverse partitions, has been spoken of highly.

Good life boats should also be furnished; as every ship should have every possible appliance to save life in any emergency. Jas. J. Eastbrook, of Tompkinsville, Staten Island, proposes gutta percha life boats, made with air-tight tubes, and suggests that a great number of them can be made strong, and yet be packed in a very small space, to be used on extraordinary occasions. The suggestion is a good one, but as we have stated before, the grand object is to make all ships on the life-boat principle.

Walking on the Sea.

Like flying in the air, walking on the water has been often essayed, but still held to be impracticable. If man possessed the ability—like that attributed to the Wandering Jew—of walking upon the great deep, it would invest him with new powers of an extraordinary character. A wonderful approach to the solution of this problem has been made by Wm. K. Phipps, of Farmington, Mass., by the invention of a life preserver, by which he has walked on the sea three miles, from land to land twice, and went ashore within two miles of where the steamer Ocean was burned in Boston Harbor. In a letter to us he states that if he had been on board of that steamer, he would have thought it but a trifling affair to have gone ashore on any of the islands in the vicinity.

Preserving Flour and Meal.

The patented plan of Thomas Pearsall, of Hooper's Valley, N. Y., for preserving flour, meal, and grain from heating and souring, by having an open pipe running through the center of a barrel of flour or meal, or a number of such tubes in bins of grain, we have tested and found to be an excellent invention. A barrel of Indian corn meal put up in May last, with one of his refrigerating tubes, is now as sweet as it was on the day it was packed. This improvement must lead to a great saving to our country, as it is calculated that no less than \$5,000,000 is lost annually by the souring of flour and the

heating of grain in piles, much, if not all, of which may be saved by the application of this invention, which is neither complex nor expensive, but simple and cheap. A barrel of corn meal, packed in one of Pearsall's patent tubular barrels, arrived in this city on the 7th of this month from Louisville. It was put up in July, and shipped to New Orleans, was kept several weeks in the hold of a steamboat, and afterwards housed in a warehouse until about the 1st of December, and yet is now perfectly sweet.

Securing and Setting Harrow Teeth.

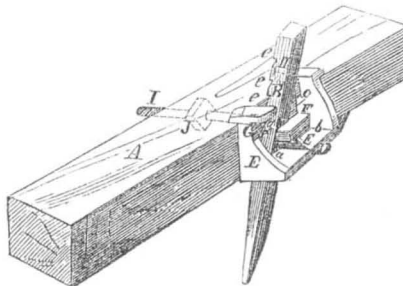


Fig. 1

This figure is a perspective view, representing an improved mode of securing and setting harrow teeth, for which a patent was granted to E. L. Hagar, of Frankfort, Herkimer Co., N. Y., on the 12th ultimo. The improvement relates to a new method of securing the teeth in the frames of harrows, also in rendering them capable of being adjusted from a vertical to an oblique position, and set to any depth desired. A represents a section of a harrow frame, B C. D E is a metal casting set in an inclined recess, cut in the inner edge of the section, A. This casting is provided with two square holes, a b, in its lower horizontal portion, D, one running in a vertical, and the other in an oblique direction. The projecting parts, B C E, of the casting form two grooves, F G, of a similar shape and size as the holes, a b, one of which runs in an oblique direction in line with the hole a, and the other in a vertical direction in line with the hole b. On the plate, B, forming the back sides of the grooves, F G, tongues, c d, are cast. The tongue c, runs at right angles to the groove F, and d at right angles to the groove G. These tongues enter notches cut in the sides of the harrow teeth, and aid in keeping said teeth in place. H is a harrow tooth. It is made square or many-sided. e e e are the adjusting notches or transverse grooves which are cast in one of the sides of the tooth. These notches receive the tongues as represented. The tooth, H, when it is to be set obliquely, is passed through the hole, a, and fitted as shown in the groove, G, and when set in a vertical position, is passed through the hole, b, and fitted in the groove, F. I J is a clamp or elbow-shaped screw bolt which passes through the plate, B, of the casting and also through the harrow frame. This bolt as it has a hook, J, on its inner end, serves for locking the harrow tooth in either of the grooves of the casting, and also as said screw passes entirely through the casting and frame, A, it serves for locking the casting firmly to the frame, A. There is a nut on the outer end of the screw bolt. This nut, by being turned, causes the hook on the screw bolt to bear against the tooth, and thereby causes the parts to be firmly clamped together. The screw bolt, I J, is so arranged in relation to the two grooves, being between them, that its hook, J, serves for locking the tooth, H, in both the positions described.

It is by providing the casting with two grooves, one oblique and the other straight, that the harrow tooth can be adjusted from a vertical to an oblique position, and vice versa, and providing the tooth with a series of notches, e e e, it can be set to any depth desired.

Making harrow teeth adjustable as described, is an important idea, for in case their points are broken off they can be sharpened, and the teeth lowered so as to stand even with the others. And also by securing the teeth to the frame, as described, they can, in

case they are broken, be removed with ease and facility, and others secured in their places with like facility.

It is also an important idea in connection with the adjusting arrangement, to have the teeth capable of being set straight or oblique, for in case it is desired to harrow shallow plowed soil, then the teeth can be set straight, and in case it is desired to harrow soil which is plowed to a greater depth, then the teeth can be set obliquely, and also lowered to the depth desired. By setting the teeth obliquely they enter the soil more readily.

More information may be obtained by letter addressed to Mr. Hagar, the patentee.

Hulled Grain.

On page 131, in a foot note to Prof. Brainard's essay on "Wheat as an article of Food," it is stated that O. P. Stevens, of Cleveland, Ohio, had invented a machine for hulling any kind of grain, and preparing it according to the method recommended by Prof. B. for making the best kind of food. We have received and tested samples of wheat, Indian corn, and oats, in the state of grits and coarse and fine meal, which was prepared by his machine; and there can be no question about their superiority over fine bolted flour for food, so far as it relates to nutriment and health, and we wish these facts were more generally appreciated.

We have also received from him a number of samples of wheat, barley, oats, and corn, which were hulled in his machine, all of which afford abundant evidence that he has achieved an important improvement in preparing all kinds of grain for food.

Lime Water in Bread.

E. C. Haserick, of Lake Village, N. H., writing to us, says that a pint of lime water added to the ferment for five lbs. of flour will neutralize all fermentation, and color the wheat yellow. In Germany bread is baked for a family about once a fortnight, and two or three bushels of flour are mixed up at one time, with yeast, and left to stand overnight, which by being left too long, or if it gets too hot, becomes acidulous or sourish. If lime water is then added, it does good service by neutralizing the excess of acid, and still leaves a sufficient quantity of carbonic acid gas to make the bread light. He believes that a little lime water is good for bread, as set forth by Liebig, but should not be added to the dough until it has risen.

The Consumption of Paper.

Forty years ago, three men, by handiwork, could scarcely manufacture 4,000 small sheets of paper in a day, while now, by the use of machinery, they can produce 60,000 in the same time. It has been calculated that if the paper produced yearly by six machines could be put together, the sheet would encircle the world. Nowhere is paper so much valued as in the United States. In France, with 35,000,000 of inhabitants, only 70,000 tons are produced yearly, of which one-seventh is for exportation. In Britain, with 28,000,000 of inhabitants, 66,000 tons are produced, while the amount produced in the United States is nearly as great as in France and England together.

Paris Universal Exhibition of 1855.

Almost all the chief seats of manufacturing industry in Britain have reported to the Department of Science and Art the formation of the local trade committees to promote the Paris Exhibition. The Council of the Civil Engineers has addressed a strong letter to its members, urging their co-operation. The Royal Agricultural Society has formed a special committee. The Corporation of Liverpool, it is said, is preparing to exhibit illustrations of its shipping in all its branches. Additional committees of trade, to those generally reported, have been formed in the metropolis for general metal-working, saddlery and harness, leather-dressing, carriages, printing, bookbinding, clothing, boots and shoes, paper-making, chemical manufactures, cutlery and gun-making; so that there appears every promise of a complete and effective display in Paris.—[London Crystal Palace Gazette.



LIST OF PATENT CLAIMS Issued from the United States Patent Office. FOR THE WEEK ENDING JANUARY 9, 1855.

PROPELLER—Charles de Bergue, of Dowgate Hill, London, Eng. Patented in England, April 6, 1854. I claim an apparatus for blade oscillating or rocking in water or other fluid, on a center or axis worked to and fro, that each of its opposite sides shall alternately present a moving inclined face or surface to the fluid on which it acts, so as to force, displace, or propel the same, or a body floating thereon, such apparatus or blade working or rocking within a case or chamber through which the fluid actuates upon it, thereby caused to pass, or conversely, in which the fluid in passing, may act on the blade, as described.

GRAIN HARVESTERS—John E. Newcomb, of Whitehall, N. Y. I claim the manner of hinged apron extensible, substantially in the manner set forth. I claim the mode of keeping the scythe plate to the shear edges of the guides, said mode consisting in the employment of the grooved pressure plate or bar and set screws for the purposes set forth.

OSILLATING ENGINES—J. A. Reed, of New York City: I do not claim any of the parts of the oscillating steam engine as my original invention nor any of the parts of said engine by me employed to carry out and effect my said improvements, as my invention, independently of their connection in the combination specified.

Window Blinds. An application for a new method of operating window blinds has been made by Charles Isbel, of Woodbury, Ct., who has assigned it to Andrew Root, of the same place. The object of it is to afford a ready and convenient means of opening and closing the slats from the interior of an apartment, without opening the window for that purpose.



## Science and Art.

## Comparison of Iron and Wooden Vessels.

M. Nilus, of Havre, makes some interesting remarks on the comparative advantages of wooden and iron vessels, which we here present in an abridged form. Almost all vessels, whether in wood or iron, have hitherto been constructed on a wrong principle. The greatest possible strength has been given to the sides and bottom, while the deck has been neglected. But a ship should be regarded as a great tube or box, capable of sustaining a load at its middle while suspended at its ends, or conversely, of sustaining loads at each end while supported at the middle. To obtain this result with the least weight of materials, the upper and lower parts of the vessel, otherwise the deck and the bottom, should be the strongest. Instead of this the deck is usually slight and weak, and is generally regarded only as a platform to be used for working the ship, or as a covering to keep the water from the interior of the hull. Iron ships should form a tube, closed at each end, and be strengthened by ribs and cross-beams, forming continuous pieces, so that the tube might be considered as strengthened by a series of rings. The sides should, of course, be rivetted to the ribs, so that the whole would form something analogous to a tubular bridge. Even the present construction of iron steamers is much superior in solidity to that of wooden ships, as a few examples will suffice to show. The *Great Britain* remained during the entire length of a severe winter, fixed on the rocks at Dundrum, and when released from her critical position was capable of being so repaired as to become a packet ship to Australia. A recent example is furnished by the *Ward Queen*, constructed by Scott Russell, with a length twelve times as great as her maximum breadth, a very high proportion for a sea-going vessel. This small steamer was employed between New Haven and Dieppe at the period of the accident. In entering the port of New Haven, at low water, with the channel too shallow, she grounded heavily, and was suspended by the middle. A breaker took her broadside on, and cast her on the beach, where the passengers easily and safely disembarked. Notwithstanding the force with which she was cast ashore, she was again launched without any strain, and was able to proceed to London for examination. After a careful inspection no important injury could be discovered. A wooden vessel of the same dimensions, under similar circumstances, would doubtless go to pieces, or at least be seriously damaged.

## History of Reaping Machines—No. 15.

On the 25th June, 1845, a patent was granted to E. C. West, of Bradford, Vt., for a rotary cutting reaper, which embraces a very ingenious gathering hand with scythes fastened to the lower end of a vertical shaft. To the cutter shaft there were secured cradle fingers, which, as they rotated, passed between the fingers of a vibrating hand which caught the straw and carried it when cut to an apron, which conducted it to a thrasher. The gathering hand was vibrated by a lever, which received motion from a cam groove in the upper end of the vertical scythe shaft.

On September 20th, the same year, a patent was granted to F. Wood, of Upper Freehold, N. J., but it only embraced the combination of a sheaf-box with the platform into which the grain was thrown before being deposited on the ground.

On March 7th, 1846, William F. Ketchum, of Buffalo, N. Y., obtained a patent for his mode of constructing rake teeth, and carrying the cut grain to the platform.

Jeremiah Darling, of Adria, Michigan, obtained a patent on March 7th, 1846, for a gathering movable platform of slats with pointed teeth, combined with a cutting and thrashing apparatus.

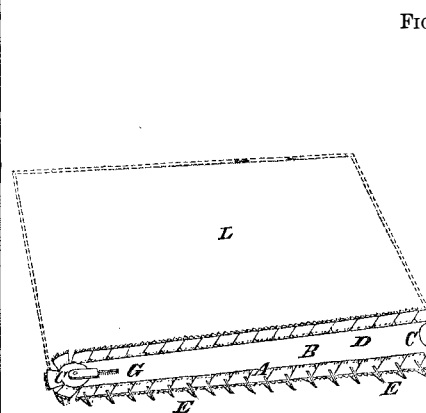
C. Foster, of Laporte, Ind., obtained a patent on April 18th, 1846, for a rake in connection with the floor of his platform.

Alex. M. Wilson, of New York, obtained a

patent on Sept. 3, 1846, for making the heel of his cutters rounded or a rotary machine. There was also a grinding wheel placed so as to grind and sharpen the upper bevelled face of the cutters. The cutting wheel was so arranged as not to be affected by the horses walking on unequal ground.

Isaac Lard, of Ashley, Missouri, obtained a patent on Nov., 20th, 1846, for an arrangement of a revolving rake to take the grass from revolving scythes.

Andrew J. Cook, of Delphi, Ind., obtained a patent on the same day for a revolving rake, also to take the cut straw off the platform at certain intervals.



On the 10th of the month following (July, 1847,) William F. Ketchum, of Buffalo, N. Y., obtained the patent for the improvements represented in fig. 43, and which, since then, has been the subject of considerable litigation and flutter among patentees and constructors of reaping machines.

This figure is an isometrical view. The following is the specification:

The nature of the invention consists, firstly, in the crooked-arm or coupling-piece, in connection and combination with the rack-piece, and the position of the same on the carriage frame, to wit: attaching it at or near the center or at any point within the diameter of the driving-wheel, whereby the grain can be raked off the platform on one side, out of the way of the track of the machine, and a greater degree of strength and stability to the rack-piece is attained, as well as producing a more perfect balance of the power applied to propel the machine, than if the attachment was made out of the circumference of the driving-wheel. Secondly: In an endless chain cutter, for cutting grain and grass, and the application of it in such a way as will cause it to run around pulleys, with the back of the cutter against them, (the pulleys are fixed on the rack-piece, of proper length for the width of the swath to be cut,) with the cutter passing around the pulleys, the cutter being covered, all but the edge, which comes in contact with the grain or grass.

The object and intention of varying the position of the rack-piece on the frame, is to produce a balance, by securing it at such a point on either side of the center of the driving wheel as shall best insure a perfect balance, and at the same time give greater security and firmness to the rack-piece. The distance at which the rack-piece must be secured to give the greater security, &c., cannot be specified, as every machine requires a different position for it; but any point within the space of one foot from the center of the driving-wheel, will be found sufficient latitude to give the desired balance.

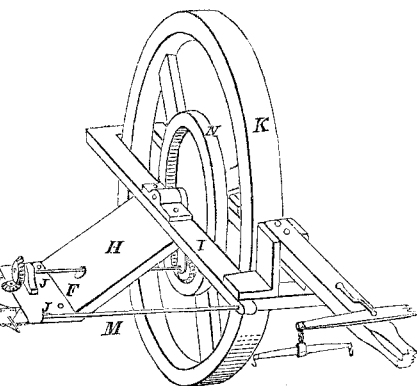
As an endless belt of cutters, connected together by lapping the longest pieces on the top of the short pieces, seen at B. The inner corner of the longest pieces are rounded off, so that the belt may bend or work around the pulleys, seen at C C. The belt of the cutters is placed on the rack-piece, D, flat-wise, and around the pulleys, edgewise. The rack teeth are fastened to the rack under the belt of cutters, and are seen at E E. The inner corners of the longest pieces or segments of the belt of cutters being rounded, allows the belt to yield and work around the pulleys edgewise. The pulley nearest the driving-wheel is propelled by cogs, on the shaft, F, which shaft is propelled by the main cog-wheel, seen at N. The other pulley yields to the uneven

Clinton Foster, of La-porte, Ind., obtained a patent on Jan. 1st, 1847, for a combined cutting and thrashing machine.

D. A. Church, and L. H. Obert, of Friendship, N. Y., and W. W. and O. F. Willoughby, of Chicago, Ill., obtained a patent on Feb. 13th, same year. The claim in the Patent Office Report is for "constructing the separation, so that it shall consist of separate combs, turning on pivots in endless chains, operating as shown."

John Dunlap, of Walworth Co., Wis.; obtained a patent on June 26th, same year, for a swinging brush on the shaft of the reels, in combination with a stationary brush.

FIGURE 43.



surface of the belt by a spring, G, bearing against its boxing.

The crooked arm or coupling-piece, H, which connects the rack-piece, D, to the cast iron frame, I, I make of cast iron, and fasten one end of it to the frame, at or near the center, or at any point within the inner circumference of the driving-wheel, K. The other end has a sort of open mortise in it, in which I fasten the rack-piece, D, with bolts, seen at J J, which rack-piece may be made of wood or wrought-iron. By connecting the rack-piece to the crooked coupling-piece, H, and the crooked coupling piece to the frame, I, I am not confined to a small driving-wheel, but can use any diameter required. With this improvement of the crooked coupling or elbow-rack, my rack and cutters are always on a level with the ground, and as near the ground as it may be required for cutting grain and grass. Although the frame and the center of the driving-wheel, where the coupling is attached, may be two feet or more from the ground, I attach this coupling or elbow anywhere on the frame within the diameter of the driving-wheel, which enables me to rake the grain off the platform, L, on one side, out of the track of the machine. I brace the rack to the frame with a wrought-iron brace from the front or rear part of the frame, seen at M.

I claim, firstly, the crooked arm or coupling-piece, in connection and combination with the rack-piece, and the attaching and securing the crooked arm, (supporting and sustaining the rack-piece to the frame,) at or about the center, so as to produce a balance, by securing it at such a point on either side of the center of the driving-wheel as shall secure the balance and give firmness to the rack-piece. Secondly, I claim the endless chain cutter, in combination with the pulleys and rack teeth for cutting grain and grass, as above set forth.

This patent has been surrendered and re-issued Oct. 21st, 1851, on Jan. 11th 1853, and again April 26th, 1853,—no less than three re-issues. As the validity of the latest re-issue must rest on what was embraced in the original machines and this figure, we will state that the gist of what is valuable in the patent is the crooked arm, H. The endless band of cutters are not used in practice, but the arm, H, has been found to be very valuable in reaping machines. The claims of the latest re-issue are as follows:

First, placing the cutter-bar and cutters lower than the frame of the machine, and opposite the side of the plane of the wheel, in such a manner as to leave unobstructed space below the frame, and also between the wheel and the cutters with their supports, to allow the machine to pass freely and without clogging over the cut grass or grain, as set forth.

Second, I also claim placing the cutters lower than the frame and axle, and in or nearly in the same vertical plane with the axle on which the frame hangs and vibrates, and parallel, or nearly so, to said axle, so that the vibrations of the frame, on uneven ground, shall not materially elevate or depress the cutters, as herein set forth.

Third, I also claim the endless chain of cutters, in combination with the guard teeth, operating substantially as described.

## The American Ostrich.

The *Minnesota Pioneer* says, that two specimens of the American Ostrich, male and female, were recently killed near Fort des Moines, Iowa. They are described as four and a half feet long, and five feet in height, with bills six inches long, straight and very sharp. They resemble, in most points, the ostrich of Africa.

## LITERARY NOTICES.

THE WORLD A WORKSHOP—This is a neat little volume by W. F. Draper, of Andover, Mass., and edited by the great Congregational lights of our country, commences a new volume with the present number—Jan. 1855—which is exceedingly rich in theological and scientific lore. It contains a fine article on the pre-existence of the human soul, another on Divine Providence and physical laws, a very able one by Rev. J. O. Means, on the narrative of the creation in Genesis, and a fine one on an excursion in the Holy Land, by Prof. Robinson. This religious Review is one of the most distinguished in the world.

BIBLIOTHECA SACRA—This able Review, published by W. F. Draper, of Andover, Mass., and edited by the great Congregational lights of our country, commences a new volume with the present number—Jan. 1855—which is exceedingly rich in theological and scientific lore. It contains a fine article on the pre-existence of the human soul, another on Divine Providence and physical laws, a very able one by Rev. J. O. Means, on the narrative of the creation in Genesis, and a fine one on an excursion in the Holy Land, by Prof. Robinson. This religious Review is one of the most distinguished in the world.

GEOGRAPHICAL AND COMMERCIAL GAZETTE.—The first number of a monthly magazine of the above name, has just been issued by J. Disturnell, No. 207 Broadway. It is to be edited by an association of practical and scientific gentlemen. This number contains a beautiful map of the Arctic Regions, and a history of the efforts made to discover a north-west passage. This is a publication much needed, and will, we have no doubt prove eminently useful.

Seven Christmas Stories, by Charles Dickens, have just been published in a neat pamphlet, by J. A. Dix, No. 17 Spruce street, N. Y. The children will never forget the pleasant stories of Dickens.



## Inventors, and Manufacturers

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