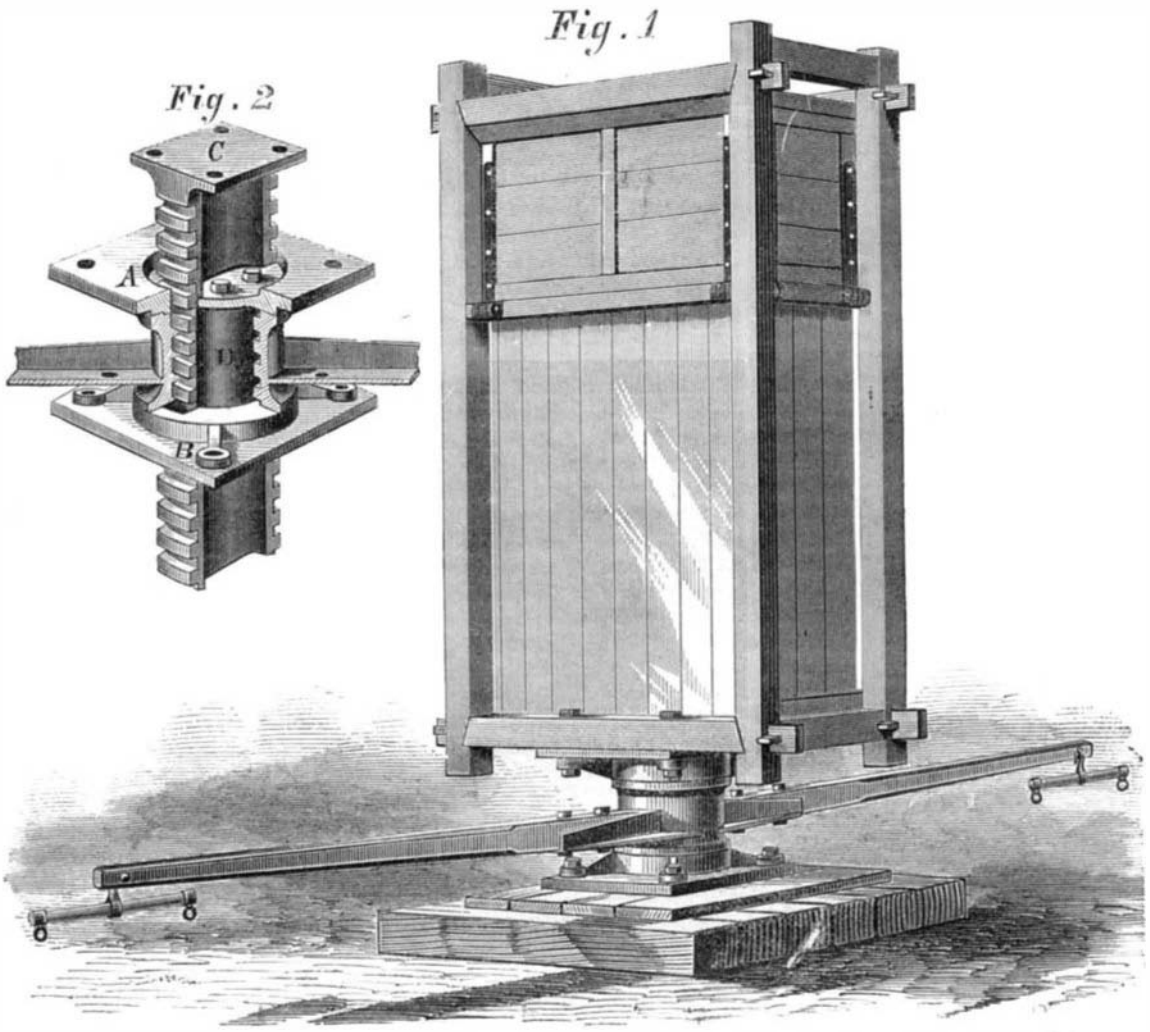
Improvement in Cotton and Hay Presses.

The simplest device for pressing and baling cotton is the screw, usually of wood, and is employed on three-fourths of the Southern plantations. It has generally a diameter of from sixteen to twenty inches, with a pitch of thread of from six to nine inches, and is operated by two long levers extending from the top of the screw at an angle until they nearly reach the ground, to the ends of which horses or mules are attached for working it. Various attempts have been made to supersede these presses, which are rude and cumbersome, work with great loss of power from friction, and, as they cannot be housed, wear out more from exposure to the weather than from actual use; and a great many presses have been invented, none of which has realized the anticipations of their inventors. They worked too slow, were too weak to give the enormous pressure required to bale cotton, could not be repaired, if broken, by means at hand on the plantation, or, perhaps, more than from any other reason, were too expensive. The wood screw has these advantages, which overcome in a measure its many disadvantages: It can be built entirely from material to be found on the plantation, requires but little iron work, works with great power, and is not complicated with levers, ropes, pulleys, and windlasses. Owing to its coarse pitch but few turns are required to run it up and down, a very important matter when it is considered that the horses move in a path from thirty to forty feet in diameter. Of late years the cast-iron screws have found favor, as the planter has only to purchase the iron work, and the wood work is done, as heretofore, on the plantation; and many forms of adapting these screws to their work have been devised, some of them having great merit.

The objections to the common cast-iron screws are these: They cannot be made of a diameter large enough to receive the coarse pitch of thread that is required to save the travel of the horse, and bale the cotton rapidly; and being of cast iron and small diameter are liable to be twisted off, as the screw presents the greatest length when the strain is the heaviest. The design of the screw here shown is to be obviate as far as possible the objections against both the wood and iron screws.



ALBERTSON'S PATENT SCREW PRESS FOR BULKY MATERIALS.

The receiver is a box, or pentstock, in the usual form, having at its upper part hinged sides or doors for removing the bale. A follower traverses the lower portion, being connected with the elevating screw. The whole is supported on a pedestal composed of two plates of any required size and form, one bolted to the receiver and the lower one to a suitable platform. They are represented in Fig. 2 by A for the upper plate and B for the lower. The follower is bolted to the end, C, of the screw. The screw is a double or triple segment of threads—in the engraving double—recessed below the depth of the thread on either side. Segments of a cylinder, D, forming portions of the plates, A and B, and hollow, admit bolts through to secure the two plates together. Between these plates turns a nut, outside the segments of the cylinder, which represent the size of the screw, the nut being furnished with sockets for the reception of levers to the outer ends of which the power—animal—is attached. It will be seen that the pedestal is the entire support of the superstructure, and the power being applied directly, near the ground, and the screw traversing through a fixed column, no unnecessary torsion or twisting of the fabric occurs.

The screw, however, may be secured to the top of the press, or, in other words, the press be inverted, if desired, although the friction and consequent power required will be greater. It will be seen that the screw cannot receive any twist, being firmly held by the pedestal at the point where the power of the nut is received by the screw, and the only strain that the screw receives is in the direction of its length. By relieving the screw from twist, the following important advantages are secured: The screw can be made very light in comparison to the weight that would be required for a cylinder receiving the twist, and any desired pitch, however coarse, can be used. There is no friction of the follower on the sides of the press box. The nut is supported by, and revolves entirely on the body of the pedestal. The iron work can be made and shipped to the plantation, and the wood work of the press made there as heretofore.

This press was patented December 15th, 1868, by James M. Albertson, of New London, Conn., to whom all letters for information regarding the manufacture and sale should be addressed.

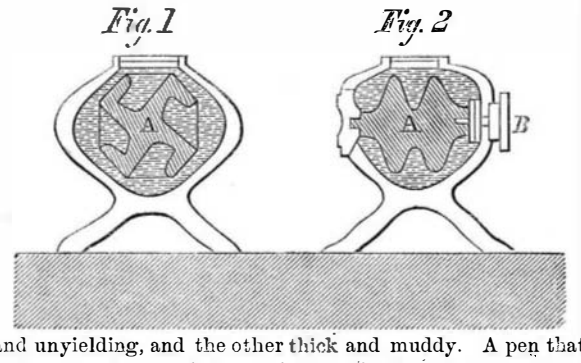
Nearly two millions of false teeth are annually turned out of a single manufactory in Philadelphia.

The Philosophy of Tea-Making.

The results of the investigations of careful experimenters are hardly, perhaps, sufficiently known to the multitude of tea-drinkers. The whole subject is carefully summarized by Dr. Letheby in his recent lectures. There is a popular notion, which is an incorrect one, that soft water is best for tea-making. As a matter of fact, water which has about five degrees of hardness when boiled, makes the best flavored tea, provided that it be allowed to stand upon the tea sufficiently long. Boiling tea is one of the follies of which the officials in workhouses and other large establishments are guilty. This makes a deep-colored solution, containing the worthless bitter extractive matter, which is devoid of physiological or dietetic property. In point of strength, it is found experimentally that infusions of tea and coffee are strong enough when about two and a half teaspoonfuls of tea, or two ounces of freshly roasted coffee, are infused in boiling water.

THE STOLTZ ROTARY INKSTAND.

Years ago we suggested as a worthy object of scientific research and mechanical ingenuity the discovery and production of something to supersede the slow, dirty, annoying, and laborious device of pen and ink. The mere muscular effort of carrying the hand back and forth from paper to inkstand and *vice versa* is no small tax on the bodily powers, and no less a tax on time. So firmly are we rooted in this opinion that we prefer the use of the common lead pencil to pen and ink whenever its use is permissible. But, in addition to this annoyance, are those of oxidized pens and oxidized ink; the first rough and unyielding, and the other thick and muddy. A pen that will not shed the ink, and ink that blurs, blots, leaves a *bas relief* of dirt on the paper, or sticks to the pen like molasses are not calculated to soothe the ruffled feathers of the hurried or worried pen driver.



We copy from the London *Mechanic's Magazine* two views of a rotary inkstand, which, it is claimed, prevents the introduction of foreign bodies, allows the contents to be shaken without spilling, and permits the quantity presented for use to be varied according to demand, while at all times the ink is preserved from contact with the air and consequent oxidation. Fig. 1 is a cross section and Fig. 2 a vertical section of the inkstand. A disk, A, containng four cups, rotates in the body of the inkstand, being turned by a button, B, projecting on the outside. Turning the button to the right fills one of the cups and brings its top or mouth to the aperture in the stand. Turning it to the left empties the ink contained in the cups and leaves the solid part of the disk under the aperture, closing the orifice. Thus the ink need never stand long enough exposed to the air to become fouled with dust or to become oxidized. Packings of rubber are interposed between the axis of the rotating disk and the side of the stand to make a hermetical joint and secure sufficient friction to keep the disk in place. These are important advantages and if they can be secured by so simple a device as the one illustrated are certainly worthy attention. We have never yet used an inkstand that fulfilled all the requirements necessary to a proper enjoyment of the delights of writing or the demands of business. If this is not perfect we are certain that its suggestions will not be lost on our inventors.

Acarus Sacchari, The Sugar Insect.

The following is a synopsis of Robert Niccol's research as to the *acarus sacchari:* Every variety of unrefined sugar contains more or less acari, minute insects, resembling somewhat the sea crab. These are well known in sugar warerooms; and no one who sees them running nimbly along the tables would ever use raw sugar. Many believe it more economical, and sweetens better, and really a teaspoonful does go farther than the white article, but it is because it is heavier, but if an equal weight of the refined was used, it would be far better. It not only impairs the flavor of the tea and coffee, but also is injurious to the health; the dry, large-grained, and light-colored is the most nutritious and economical. In a pound of sugar there are no less than 100,000 of these insects. Dr. Hassel says that out of seventy-two samples, he observed sixty-nine in a living state. By dissolving a spoonful of raw sugar in a glass of water, these may be seen on the surface as white specks. In refined sugar they do not occur, because they cannot pass through the charcoal filters of the refinery, and because it does not contain any nitrogenous substance, as albumen, for even the most insignificent animal cannot exist if entirely deprived of nitrogen. When the refined article is left too long in iron cisterns, after its solution in water has been effected, a trace of the metal may become dissolved, in which the sugar is impure, this rarely however occurs. Grocers and sugar-warehouse men are subject to a kind of "itch," affecting their hands and wrists only, and as they are usually of cleanly habits, the disease can only be accounted for in this way, that the *acarus sacchari*, like its congener, the *acarus scabiei*, has burrowing propensities, bores into their skin, and breeds there. These two resemble each other closely, though the sugar insect is larger and more formidable. Pure sugar is almost as desirable as pure water, and who would, who has any pretension to cleanliness, drink stagnant water if he could as easily obtain it pure, and who would eat raw sugar, teeming with animalcules and vegetable impurities, if the refined article were as easily purchased?

Utilization of the Refuse Lime of the Gas Works for the Manufacture of Sal Ammoniac and Prussian Blue.—The lime used in the gas works for the purification of the gas becomes charged chiefly with two products of the destructive distillation of coal—results of the combination of its nascent nitrogen, viz., ammonia NH_3 and cyanogen NC_2. When steam is passed over such lime the ammonia escapes and may be passed through sulphuric acid, when sulphate of ammonia is obtained. By treating this with common salt (chloride of sodium) is easily decomposed into sulphate of soda and chloride of ammonium or sal ammoniac. The remaining lime, freed from the ammonia, contains the soluble ferro-cyanide of calcium; this is extracted by solution in water, and after filtration the clear solution is mixed with a solution of sulphate of iron, when the ferro-cyanide of iron or Prussian blue is precipitated. This is collected, washed, and dried.

Dr. Detheir, of Constantinople, gives a description of the great bronze cannon used by Mahomet in the siege of Constantinople. Its weight was 80,596 lbs.; length, thirty feet; caliber, 46 inches; and the charge of powder required was 200 lbs. The balls used were stones, weighing 1,200 lbs. The American Rodman gun weighs 116,497 lbs.; has a length of 25 feet; caliber, 20 inches, and carries a ball of 1,000 lbs., with a charge of 100 lbs. of powder.

A System of metallic ceilings, which consists in the application to the joisling of very thin stamped metal in ornamental embossed panels, has lately been invented. These stamped panels are fitted for every kind of decoration in color, and if inserted as plain surfaces may be used as the ground for every description of cartoon painting, combining with lightness and durability, artistic and ornamental effect.