in a strong, substantial manner; and with this attachment the machine will work stuff tapering six inches or more in a length of ten feet. The bed plate directly under the upper cutter head is a false plate so that it can be easily removed and dressed over in case it becomes worn out of true.

This machine has received first prizes wherever exhibited for competition.

These machines are now running in many of the first class mills in all parts of the country, and the one above mentioned just put up in Steinway & Sons' manufactory will repay a visit to see.

For further particulars address S. A. Woods, sole manufacturer of Woodbury's patent planer and matcher, 91 Liberty street, New York, and 67 Sudbury street, Boston. [See advertisement in another column].

MANUFACTURE OF COTTON SEED, COTTON SEED CAKES, AND MEAL.

BY C. WIDEMANN, CHEMIST, PARIS, FRANCE.

No. II.

It was at first proposed—and it has been tried by many—to work cotton seed along with linseed, so as to obtain an oil, which, in being boiled with oxidizing agents, would replace for painting purposes the linseed oil, and, being cheaper, would be used extensively. This has been dropped at the present time but will no doubt be taken up again.

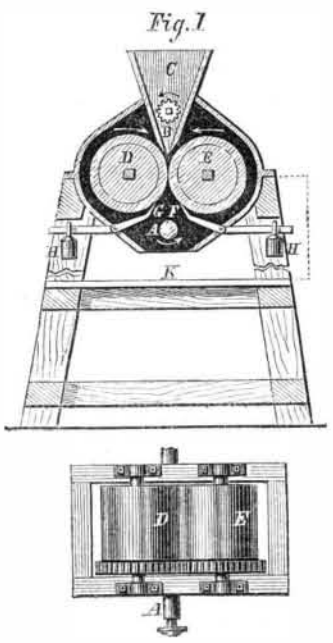
It is very difficult to ascertain the exact yield of oil produced, and this yield varies a great deal according as the seed is of better or poorer quality and richness, according to the weather of the season in which it has been sown, dry weather giving a smaller seed but richer in oil. From my own experience I shall take the following figures:

For 2,000 pounds cotton seed, or 1 tun, cotton from the last ginning, 21 pounds; husks, 979 pounds; meal, yielding from 32 to 36 gallons of oil. 270 pounds; cakes, at 7½ pounds per gallon, 730 pounds. Total, 2,000 pounds.

Let us take now the seed at the entrance of the oil mill. As it arrives in the bags it ought to be immediately unpacked and aired by shoveling it from one place to another, and this should be done very frequently as the fermentation sets in very rapidly. This is known by putting the hand in the seed; if heat is felt the seed has to be worked as quick as possible, and in every case removed and cooled by airing. It therefore requires a large store room to manage it properly. The average weight of one bag is 92 pounds, and the average work done by a good pressman and a Taylor's press, for ten hours' work, is 250 bags or 11½ tuns. Generally oil mills work night and day, as there is a great advantage in not letting the presses and mill cool down.

The cotton seed to be freed from the foreign matters it may contain, is passed in through a screen; a large cylinder made of wire cloth, the holes being sufficient to let the seed escape and retain the foreign substances. It is next carried to the top of the building where it passes through the gins. After this it goes through the huller. The huller generally used is of two sizes; the large size is sufficient for the supply of two presses of three sets for night and day labor. The smallest size is sufficient for one day's work with two presses. From the huller the kernels and husks are passed again through a screen, and then through a blower, which separates entirely the husks from the kernels. The kernels are then carried to the grinding mill and are passed through crushing rollers which I shall now describe. This machine, Fig. 1, is composed of two cylinders in cast iron, D E, covered with steel, hollow, and working at equal speed, with a distance between them which can be regulated at will. One of these cylinders receives motion and transmits it to the other by a pinion. A hopper of wood, C, is kept full of seed, and feeds the rollers by means of a little fluted wooden roller, B, the acceleration of which is regulated at will.

Fig. 1

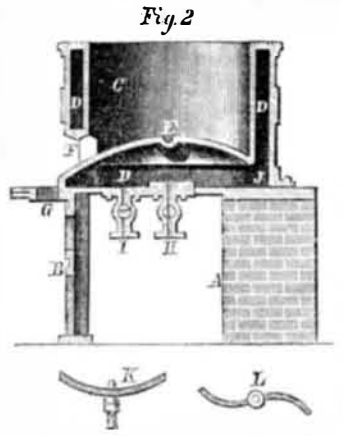


A machine of this description, the cylinders 26 inches in length and 6 inches in diameter, with a speed of 40 to 50 revolutions per minute, crushes per day 12½ bushels of seed and supplies two pairs of mill stones. It is worked by one horse power. I say mill stones, because the seed was formerly passed under double upright millstones so as to grind the kernel thoroughly; but this has been abandoned by most manufacturers as a good crusher answers the purpose sufficiently well, especially if the distance of the two rollers is well regulated. The crushing is then perfect and the meal comes out sufficiently fine. This is tested by grinding it between the teeth. If fine enough it must be perfectly free from perceptible grains. It is next placed in the heaters, and upon this operation depends both the yield of oil and its quality. In Marseilles, where labor is cheap, the meal is first pressed cold, as the oil obtained thus is very fine, possessing a very sweet taste, like olive oil, and may be used like the latter for the table. Oil designed for the table ought to be expressed cold. After the cakes are reground, the meal is heated and repressed. The second yield of oil is of inferior quality to the first yield.

In this country, where labor is high, manufacturers prefer to obtain at first as much oil as they can with the least handling possible. As I said, the meal is placed in the heaters after grinding; these heaters are constructed in different ways. I have seen some made of a large table heated by steam, with iron rings four inches high placed concentric to each other, and a stirrer in the center worked by power from the steam shaft above. Only a small portion of meal is heated at a time, I should say enough to fill a press bag; but I am not satisfied with these heaters as they present too large a cooling surface to the air.

The best heaters are those attached to the presses, and they heat for the 15 boxes of the three sets of presses. They are made of cast iron. The whole apparatus, Fig. 2, is supported by brick work, A, and by a cast iron support on the other side of the frame, B. C is a cast iron basin with a convex bottom, at the middle of which is a receiving hole, E, to receive the stirrer, K. D is a steam jacket. This basin and steam jacket are cast in one piece and fixed on the platform, T, by means of bolts. The steam is admitted to the steam jacket through H, the condensation water escaping through the pipe, I. A sufficient quantity of meal being introduced into C, the stirrer is set in motion and the steam let in; and when the temperature of 82° to 88° Centigrade, or 180° to 190° Fahrenheit is obtained, the gate, F, is opened, a bag placed at the entrance, G, and the meal is then let into the bag.

Fig. 2



The bags are made of a certain kind of woolen duck, manufactured expressly for that purpose. The best woolen yarn is used for their manufacture, and only two parties make them in this country. The cloth is about 32 to 34 inches wide, and is sold by the pound at a price running from $1·10 to $1·40. The weight of a yard of the cloth generally used is from 1 pound to 1 pound 4 ounces, and it can be used as well for linseed as for cotton seed. The bags are made in the mills by the pressmen themselves, and sewed on a wooden pattern to fit the squeezers. The old bags are sold at 6 to 8 cents per pound when they are quite out of order, as they can be repaired and are repaired with the same yarn they are made of by the pressmen, or women engaged for that purpose. A great saving could be made in cloth if parties would manufacture them as neatly as other bags, instead of in the coarse way they are now made in the mills.

The bag being properly filled, that is to say, not quite to the top, it must be thrown in double to close it in the squeezer, the meal being well distributed all along it. The squeezer is then introduced in the box of the hydraulic press, Fig. 3. The squeezers, Fig. 4, are made of horse hair cord and covered with leather, to which a handle is riveted. The rivets ought to be of iron, as copper is very soon oxidized by the action of acid fats. These squeezers are quite expensive, and are sold from $26 to $28 a piece. They last one year and a half to two years. They are easily repaired, but have to be kept in good order and cleaned as soon as the dust, or meal, and other impurities have begun to adhere, by hammering them with wooden hammers. I shall not describe the presses as they are nearly like all other hydraulic presses, differing only in some improvements of the packing of the plungers, in the adaptation of check valves, etc. The pressure must be one and one half tuns to obtain a good cake, or 85 pounds per square inch. The cake must not be more than half an inch thick or very little over, and should weigh from 7 to 7½ pounds. The presses, when charged, are left for twenty minutes and then the squeezers are taken out.

Fig. 3.

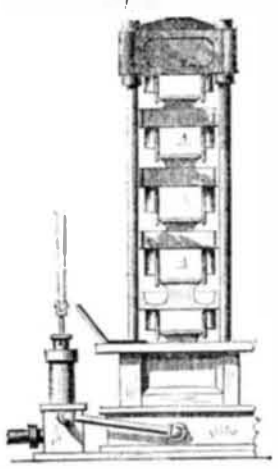
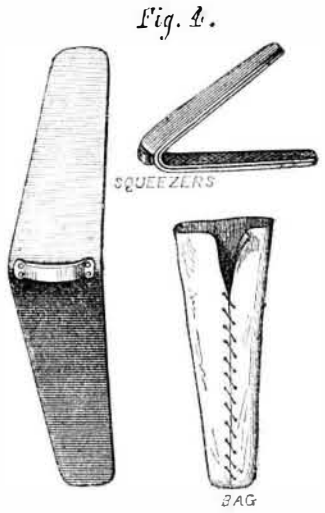
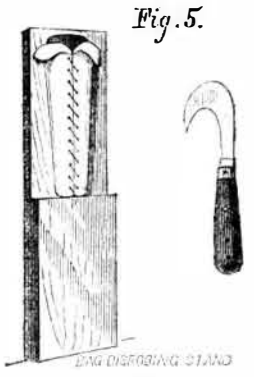


Fig. 4.



The cake is taken out of the bag by setting the bottom of the bag against a board and turning it inside out. The cake is carried to a special room, where a man with a kind of half circular knife, Fig. 5, trims the edges and cuts the top and bottom. Sometimes the cuttings are reground and repressed, as these parts have never been as well pressed as the middle part. The trimmed cakes are then placed on frames upon their edges, and left to dry; care being taken not to have them put too close to each other, so that the air may have free circulation all around them. Cakes would soon decay through the action of the moisture remaining in them. It is very important the meal should retain its temperature, and some works to that end have had iron pipes passing behind and between the sets, so as to heat the whole structure. It is always observed that the set near the heater yields a larger quantity of oil than the last set. This is a consequence of the heat communicated to the press from the heater.

Fig. 5.

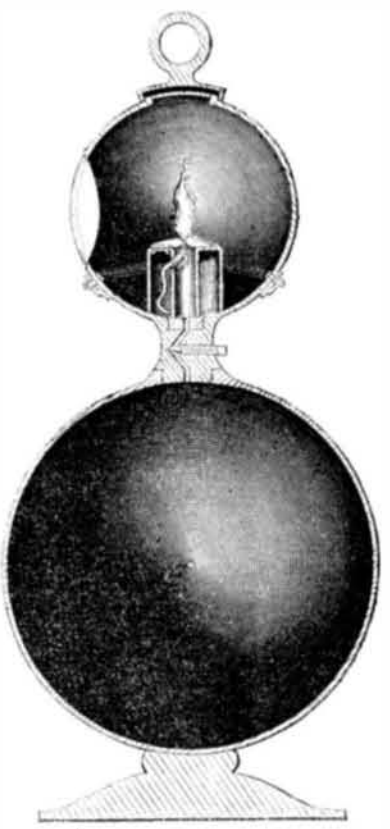


Correspondence.

The Editors are not responsible for the Opinions expressed by their Correspondents.

Safety Lamp for Miners.

MESSRS. EDITORS:—The SCIENTIFIC AMERICAN of September 25, 1869, contains an article on the Avondale disaster, and a notice of a lamp recommended by W. H. Bessemer. I inclose a drawing of a lamp made by me as far back as 1829 on the same principle as that recommended by Mr. Bessemer. From my knowledge of miners I have always considered that there could be no safety while they had the control of the



lamps. I therefore made one like the drawing, part of which I still have. The globe containing the condensed air is 10 inches in diameter, the lamp 6 inches, with a joint made tight by leather (better rubber), and locked; the lamp was made to burn the oils common in those days, and would throw the light a great distance, so that it might be placed in safety and yet give a better light to the miner than the Davy. At the top was a piece of wire gauze for the exit of the products of combustion; the whole was made of copper.

The miners of those days thought themselves quite safe with the Davy, and all I got was the name of a schemer, and sundry lectures on my folly, when, soon after, leaving England, I had other things to attend to.

I could never get anybody to see any good in my invention. Perhaps I have been too far ahead of time, as many explosions have been required to prove the Davy not altogether safe.

FREDERICK LEAR.

Willsborough, Mo.

The Wandering Jew, or Cow Killer.

MESSRS. EDITORS:—My attention has been arrested by the article bearing the above title, on page 43, current volume of your journal. Both names are new to me, having never heard them applied to an insect, which, by the description is clearly that of the large red stinging ant, a species of *Mutilla*, a genus among the order of *Hymenoptera*.

Thomas Say describes six species found within the United States, while thirty-eight species are noticed in Rees' Cyclopedia. They are solitary in their habits. The females are always found on the ground, abounding mostly in hot, sandy situations. The males resemble other sand wasps, being pro