

## Science and Art.

## Purifying Cotton Seed for the Manufacture of Oil and Oil Cake.

Heretofore the efforts made to render the seed of the cotton plant available for the production of oil, or for the purpose of feeding man or domestic animals, have not been productive of perfect results, owing to the nature of the shell, by which the kernel of the seed is enclosed, as some fibers of the cotton adhere to it, and both the shell and the fibers of cotton absorb a considerable portion of the oil, and also render the cake unsuitable for feeding purposes. On the 24th of July last, a patent was granted to Daniel W. Messer, of Boston, Mass., for an improvement in preparing cotton seed, having for its object the removal of the above evils. The nature of this improvement consists in the separation of the shell of the seed from the kernel, previous to expressing the oil, by which a greater quantity of oil is obtained from the same amount of seed, whilst the residuum, or oil cake, is left free from shell and cotton fiber, and is therefore rendered much superior for feeding cattle. This he accomplishes as follows:—

The shell of the cotton seed is first softened by soaking it in water, or by subjecting it to the action of low steam. When boiling water is employed, about five minutes' immersion of the seed in it is sufficient; when cold water is employed, a much longer time is necessary; and the time required to soften different varieties of seed, varies with the amount of moisture in the seed. After the seed is thus softened, it is passed through proper rollers, or subjected to gentle pressure in a press in small quantities. By this means the shell is broken, and the kernel is forced out. Both the kernels and shells of the seed are then dried in the sun, or by very low artificial heat. If the oil is to be used for culinary purposes, great care must be taken not to dry the kernels under a high heat. When dry, the kernels and seeds are separated from one another by sieves, and the oil is then expressed from the clear kernels by passing them between revolving pressure rollers, or any suitable oil pressing mill. The residuum, or skin, of the pure kernels form beautiful oil-cakes for feeding cattle. The subjecting of the cotton seed to soften it, then afterwards separating the kernels perfectly free from the shell for the purpose described, constitutes the invention of Mr. Messer, and it appears to be one of importance to our cotton planters.

## Power of Steam under Great Pressure.

It has been remarked by very able chemists that gunpowder is one thousand times denser than the atmosphere. If, therefore, one thousand cubic inches of atmosphere were compressed into one inch, the one inch will be of the same strength as one cubic inch of gunpowder. Steam possesses about one-half the gravity (or weight) of the atmosphere; therefore, if 1,728 inches of steam, which can be generated from one single cubic inch of water, were compressed into one inch, it would become nearly twice the strength of one cubic inch of gunpowder. This fact will illustrate the great expansive force of steam. From these data approximately, according to the size, contents, and area of the boiler, its explosive power may be estimated; therefore we need not be surprised that those results ensue wherein tons weight of material are driven to great distances by the explosions of steam boilers.

## Fumigating Paper.

There are two modes of preparing this article:—First, take sheets of light cartridge paper, and dip them into a solution of alum; say, alum one ounce; water, one pint. After they are thoroughly moistened, let them be well dried. Upon one side of this paper spread a mixture of equal parts of gum benzoin and balm of tolu; or the benzoin may be used alone. To spread the gum and balm, it is necessary that they should be melted in an earthenware vessel, and poured thinly over the paper. Finally, the surface is smoothed with a hot spatula or iron. When required for use, slips of this paper are held over a candle, so as to evaporate the odorous matter, but not to

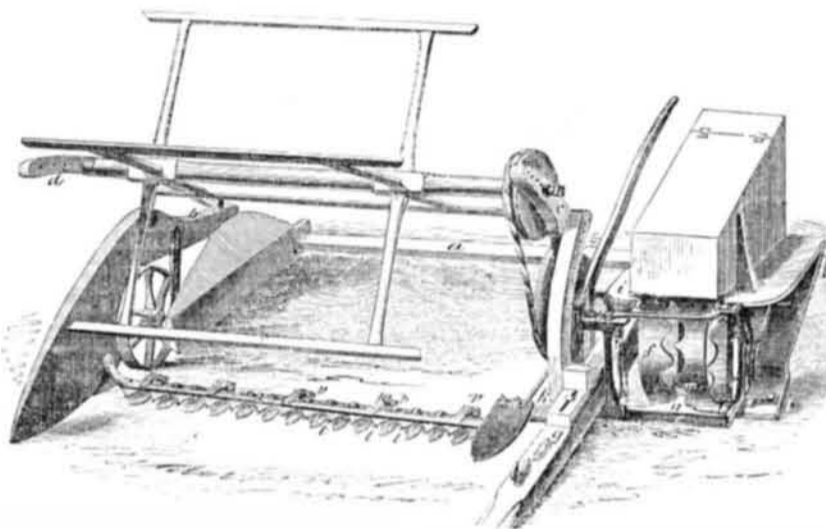
ignite. The alum in the paper prevents it, to a certain extent, from burning.

Second, sheets of good light paper are to be steeped in a solution of saltpeter, in the proportion of two ounces of the saltpeter to one pint of water; to be afterwards thoroughly dried. Gum benzoin and tolu, alone or together, are to be dissolved, to saturation, in rectified spirit or pale brandy, and with a brush spread upon the paper, which, being hung up,

rapidly dries. Slips of this paper, rolled up as spills, are to be ignited and then blown out; the saltpeter in the paper causes a slow combustion to continue, diffusing, during that time, the agreeable perfume of the odoriferous gums.

If two of these sheets of paper be pressed together, before the surface is dry, they will join and become as one. When cut into slips, they form what are called "Odoriferous Lighters."—[S. Piesse's Art of Perfumery.

## HEATH'S PATENT REAPER.



This figure is a perspective view of a reaper illustrating the improvements for which a patent has been granted to John E. Heath, assignor to Henderson & Caryl, Sandusky, Ohio.

The nature of the improvements consist in the manner of suspending the cutter-bar by stirrups near the ground, in front or behind the driving-wheel, and in or near the same plane as the finger-board, in combination with an angular friction roller whereby the stability of the machine is increased and its draft diminished. It also consists in having an adjustable cutter-bar to regulate the pressure between the cutters and reaper, as may be desired.

*a* is a wooden back piece and *b* is a wooden side piece; *c* and *d* are cross pieces, securely fastened to an iron front piece, *e*, which extends across the whole width of the machine. There are standards rising from the cross pieces, *c* *d*, in which are placed the bearings of the axle or shaft of the driving wheel, *f*. The end of the tongue, *g*, is hinged to the standard on the piece *c*. On the top of the arm, *i*, an upright lever has its fulcrum pin. It projects upwards from the tongue, *g*, and has its forward end hinged to a strong staple, *n*, which rises from the front piece, *e*. The tongue passes through this staple, which is sufficiently high to allow the lever to elevate the front part of the machine over any obstacle, or over the cut grass when turning. Upon the tongue, *g*, in front of the staple is placed a gauge block, *k*, attached by a screw in a slot. This block serves to adjust the height of the cutters according to the height of the team or nature of the ground. A slit is formed in the periphery of the driving wheel, *f*, of such a form as to give a rapid reciprocating motion to the friction roller, *m*, when the machine is in motion. This roller plays loosely upon an arm projecting upwards and backwards at an angle of about 45 degrees from the horizontal cutter bar, *n*, which is suspended from the top of two standards by the hinged stirrups, *g* and *r*. By this arrangement, the friction of the cutter bar is reduced to a minimum, and run very near the ground. The power being transmitted from the driving wheel near its point of contact with the ground increases the stability of the machine and diminishes its draft. Upon the upper side of the cutter bar, *n*, are bolted the separate cutting teeth, *t*. These are placed close together and their cutting edges are beveled on their upper side—meeting at an acute angle in front. The fingers, *u*, are also made separate, and in a T form, with points in front. The portions which are opposed to the cutting edges of the teeth, *t*, are beveled on the under side and ground sharp. The rear portions of the fingers are of the same thickness as the cutter bar, *n*, and being firmly secured on the front half of the width of the front piece, *e*, form a rebate in which the cutter bar traverses. From the rear of the front piece, *e*, there project horizontal pieces, *v*, to which bent pieces or jacks,

*w*, are secured by set screws. These jacks are connected by their forward extremities to an adjustable pressure bar, *x*, which bears upon the upper sides of the teeth, *t*, its front corresponding with the point of junction of the cutting edges of the teeth. This bar, with the jacks and set screws, serves to regulate the pressure between the cutters and fingers, as may be desirable. The rod is supported on the frame, and is rotated by a cord passing over a pulley on the driving shaft and another on the axis of the reel.

Messrs. Henderson & Caryl have manufactured a great number of these machines, and have been very successful in so doing, as they assure us that not one of them has yet been returned for repairs. They are now busy making about 1,500, to have them ready for the spring and summer sales. Mr. Heath has obtained several patents on harvesters, but this one embraces his most recent improvements.

More information relating to the sale and manufacture of these machines may be obtained by letter addressed to D. C. Henderson & Co., Sandusky, Ohio.

## Quartz Ware.

The *Mount Alexander Mail*, Australia, states "that a miner at that place named Thomas Golithly, is about to apply for a patent for a process he has invented of obtaining castings of quartz resembling Chinaware in transparency. By chemical experiment, he has ascertained that the mineral may be fused and cast into any required shape. Of course, if this be true, it will no longer be necessary to crush it in order to wash out the gold from the fragments, for by simply melting it, the gold may be separated more easily, and to do this Mr. Golithly has invented a process. The quartz being melted, the casting into ware is intended to be then performed without the necessity of a melting for that especial purpose. Besides the transparency mentioned, the quartz ware would, it is said, equal in whiteness the purest alabaster. Such an invention would, of course, be of the greatest value to both Australia and California, and should it prove practical, the manufacture of quartz ware would probably soon become one of the most important branches of industry in both regions."

[We cannot discover anything new in the above alleged discovery. Quartz can be cast, and is now cast into a variety of forms,—cast glass articles for example.

## Great Feat in Ascending an Inclined Rope.

An Italian named Signor Caroni, and his wife, both beyond middle age, recently walked on tight ropes from the ground to the top of a four-story building, in San Francisco. The height was 64 feet, and the length of rope 175 feet. The ropes were an inch and a quarter in diameter, placed three feet apart, and steadied by guys. The feat was performed with ease in the presence of a large crowd of spectators.

## The Dhooa or Indian Millet.

This plant bears a small kind of grain, much cultivated and extensively consumed in India and Egypt, and the interior of Africa; it is quite equal in nutritive value to the average of English wheats, and yields a beautiful white flour. Prof. Johnston, recently deceased, analyzed it, and found that it contained 11 1-4 per cent. of gluten. Now, since gluten is the chief nutritive ingredient of all our grains, this comparison of the Professor exhibits, at once, a nutritive value for the Dhooa that surpasses some of the richest grains in use for the food of man or stock.

Some of this grain has been raised this year by Major R. A. Griffin, of Abbeville, S. C., and it has proven to be a valuable crop, as we learn by the *Abbeville Banner*. He planted it some time in April, four feet in the row, and fifteen inches in the drill, depositing five or six grains in a hill. He afterwards thinned down to one stalk, transplanting to hills that were deficient. This thinning is necessary, from the strong tendency of the plant to sucker and spread. The soil, such as would be selected for common corn, should be properly prepared and manured before planting; the yield is from 80 to 100 bushels per acre.

Extending his experiments recently to the green stalk of the Dhooa, Major G. discovered a cause of its being so much relished by stock, and its singular fattening effects, in addition to the excellent qualities of its grain. He found, on chewing the stalk, which he perceived was consumed in this way by the stock, that it was exceedingly rich in cane juice—but little inferior to the sugar cane itself.

During the last month, the Illinois Central Railroad Company has sold land to the amount of one million one hundred thousand dollars—nineteen-twentieths of which has gone into the hands of actual settlers.



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