(No Model.) 2 Sheets—Sheet 1.

J. L. WEATHERHEAD & J. S. COCHRAN.

COTTON SEED CLEANER.

No. 384,803. Patented June 19, 1888.

Fig. 2

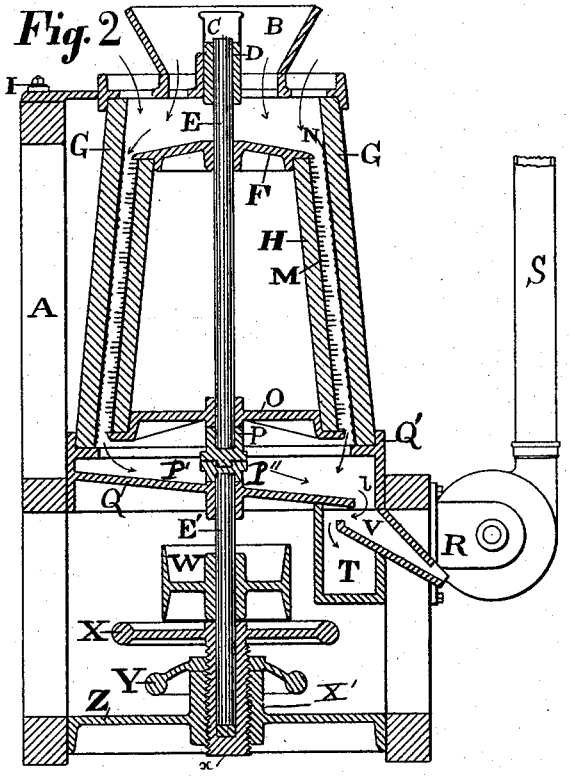


Fig. 3

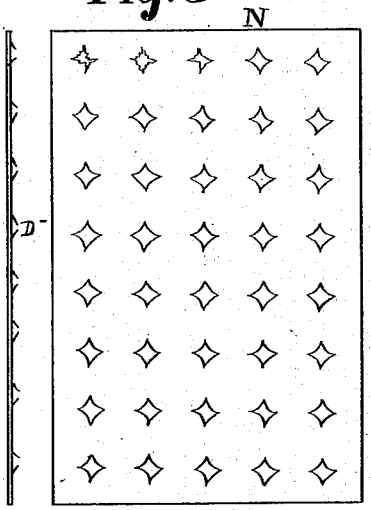


Fig. 4

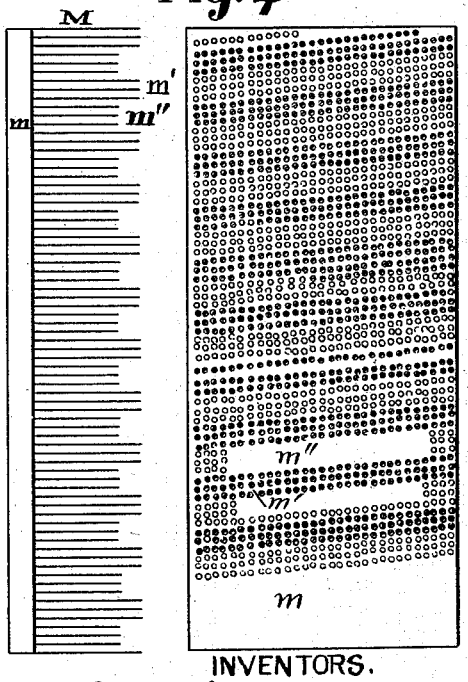
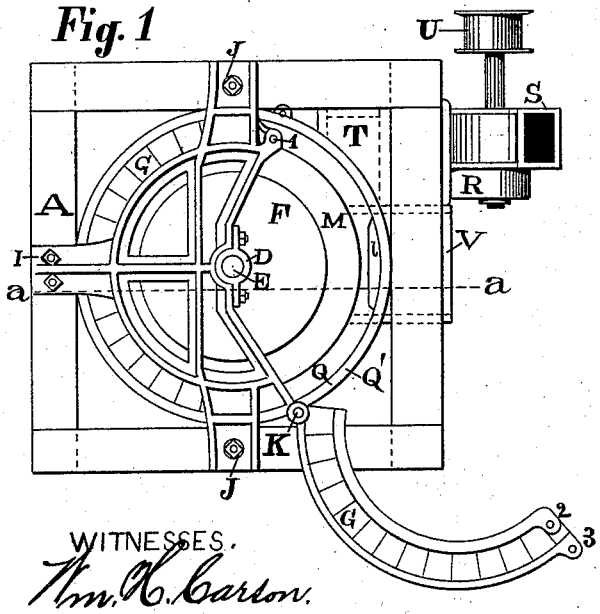


Fig. 1



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(No Model.) 2 Sheets—Sheet 2.

J. L. WEATHERHEAD & J. S. COCHRAN.

COTTON SEED CLEANER.

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Fig. 5

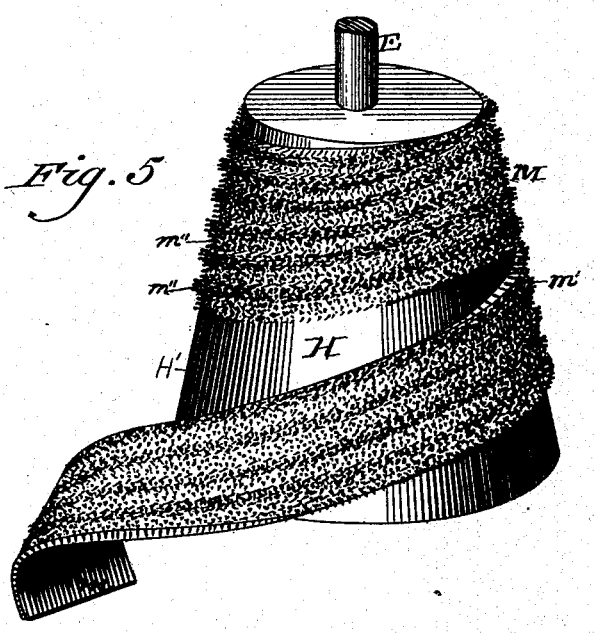
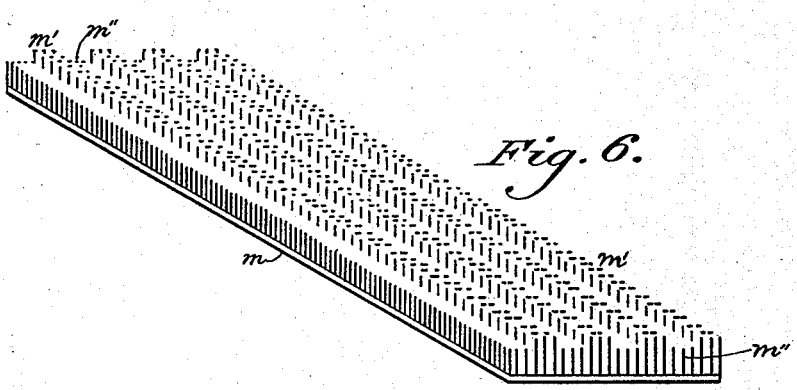


Fig. 6.



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UNITED STATES PATENT OFFICE.

JAMES L. WEATHERHEAD AND JAMES S. COCHRAN, OF PHILADELPHIA, PENNSYLVANIA.

COTTON-SEED CLEANER.

SPECIFICATION forming part of Letters Patent No. 384,803, dated June 19, 1888.

Application filed January 3, 1888. Serial No. 259,613. (No model.)

To all whom it may concern:

Be it known that we, JAMES L. WEATHERHEAD and JAMES S. COCHRAN, joint inventors, citizens of the United States, and residents of Philadelphia, Pennsylvania, have invented certain new and useful Improvements in Cotton-Seed Cleaners, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part hereof.

The object of our invention is particularly to remove from cotton-seed the lint or fiber which clings to the seed after the operation of ginning, although the machine constituting the subject of our invention is equally useful for cleaning grain-kernels of adhering particles of hull and other clinging attachments.

The nature of our invention will appear from the following specification and the claims at the end thereof.

In the drawings, Figure 1 is a plan view of our improved machine, showing the side of the outer cone open. Fig. 2 is a vertical sectional view of the same on the line *a a* of Fig. 1, showing the interior construction. Fig. 3 is a front view of a section of the interior face of the outer cone, supplemented by an edge view of the same, showing the form of the grating-surfaces. Fig. 4 is a front view of a rectangular section of a portion of the outer face of the inner cone, showing the spiral ridges of the brush-surface, supplemented by an edge view of said section. Fig. 5 is a perspective view of the inner cone partially covered with the brush-strip and indicating the manner of winding the latter about the cone; and Fig. 6 is a detached isometrical view of part of a wire brush-strip, showing the long and short wires of the same.

A is the frame of the machine, and B the hopper at the upper end thereof, into which the seed or grain to be cleaned is poured.

G is a stationary conical casing covered interiorly with the perforated metal sheets or plates N, the struck-up or burr portions of which project from the concave surface of the said plates or sheets to form a rough rubbing-surface.

H is a revolving cone placed within the conical casing and clothed exteriorly with the brush material M, composed of the leather, rubber, or cloth backing-strip *m* and the steel pins or staples *m' m''*, staples such as are employed for card-clothing being used by preference.

The wires *m'* of the brush are somewhat longer than the wires *m''*, and the two lengths of wire are arranged in alternating rows extending longitudinally of the backing *m*. (See Fig. 6.) The strip or strips of surfacing or clothing thus made are wrapped spirally around the body H' of the cone, (see Fig. 5,) so that the rows of long and short wires form spiral ridges and depressions extending around the cone from the top to the bottom thereof. Cone H is mounted rigidly upon the upper section, E, of the middle vertical revolving shaft, E E', with the outer surface thereof in close proximity to the roughened inner surface of casing G.

F is the convex top of the cone H; O, the bottom thereof.

The upper shaft-section, E, sits rigidly in the foot P, which latter is formed with a lug, P', square or polygonal in horizontal cross-section, fitting in a corresponding shaped socket in the support P^2. The support P^2 is fixed rigidly on the top of the lower shaft-section, E', which latter passes freely through and revolves in a box in the center of the stationary slanted or inclined receiving-floor Q beneath the open space under cone H and casing G, said casing being open at the bottom to permit the seed or grain to fall through after cleansing. A narrow open space is left between the outer surface of cone H and the inner surface of casing G for the passage of the seed or grain being treated.

R is a revolving fan or blower to draw a current of air down through the space between the surfaces of the cone and casing to carry off the chaff, cotton, and light particles through conduit S.

U is a flanged pulley to drive the fan or blower R.

T is a box or chest through which the light particles are drawn by the blower R, which latter communicates with it behind the trough or spout V, which latter receives the heavy cleansed seeds or grains which are too

weighty to be affected by the air-current created by the blower and serves to discharge them from the apparatus. The floor Q projects a short distance over the upper opening of box T, so as to allow the heavy seed or grain to fall by gravity into the trough or spout V.

W is a pulley fixed on the lower shaft-section, E'.

X is a hand-wheel provided with a screw-threaded downwardly-projecting hub, *x*, engaging in a stationary female screw-threaded block, X', on the plate Z. Y is a lock-nut with hand-wheel. The hub *x* of wheel X receives and forms a step-bearing for the lower end of the shaft-section E'. By turning the wheel X the shaft E E' is raised, and with it the cone H, whereby, as the brushes wear, the cone H can be moved up to preserve the requisite distance between its brush-surface and the inner grating-surface of the casing G.

I and J are bolts to hold the parts together.

K is a hinge upon which is swung the opening part G' of the casing G.

1, 2, and 3 are ears provided with eyes or holes for the reception of a pin to lock the flap portion G' when it is closed.

l represents the opening in the floor Q between the lower edge of floor Q and the box T.

Q' is a flange within which the casing G rests.

C is a cap mounted over the upper end of the shaft-section E, which latter terminates in the box D.

The operation of our machine is as follows: The pulley W is driven by a belt. This revolves the shaft E E' and cone H. A belt upon the pulley U drives the blower R. The cotton-seed or grain is fed in at the hopper B and passes down between the brush-surface M and the grating surface N. The seed is rubbed and cleaned by these two surfaces of all the fibers clinging to it, and as the seed and cotton come down (both being assisted in the descent by the current induced by blower R) they drop upon the floor Q. They then pass down through opening *l*, and the heavier seed drop into the spout V, while the light fiber and false seeds are drawn by the current of air into the box T in the direction indicated by the arrow, and thence pass through the blower into and through conduit S, from which they are delivered at any convenient point. If it is desired to reclothe the cone H, or in any way to repair the interior of the upper part of the machine, the flap-section G'(which forms about one-half of the outer cone) is unlatched and thrown open and back on its hinge K, cap C and box D are lifted out of the hopper B, and the cone, with the upper shaft-section, E, is removed through the opening formed by throwing back flap G'. It sometimes happens that when the seed is damp it, with its fibers, will clog and "rope" around the cone H. In such case the flap G' can be thrown back, and the cone will free itself by throwing the mass of matter through the opening. If the material under treatment becomes ignited by any means, this flap can be thrown open, and an extinguisher may be promptly applied to stop the flame.

Ears 1, 2, and 3 may be replaced by any well-known door-fastening device.

The spiral ridges and depressions on the surface of the cone assist the material under treatment in its downward traverse, as the cone is so turned as to give the said material this tendency. The special object in making the brush-surface with the spiral ridges and depressions, however, is to enable the machine to clean effectually both large and small seeds without breaking the large seeds. The cone may be so adjusted relatively to the casing that the wires forming the ridges will act to thoroughly free the small seeds from lint, &c., while the large seeds will be received in the depressions and therein be so treated as to thoroughly cleanse the same. Were the cone constructed with a plain or uniform surface, the large seeds would be cut and partially or wholly hulled, or the smaller seeds would in whole or in part escape the cleansing action, this depending upon the adjustment of the cone within the casing. The depressions form spiral channels in which the downward movement of the seeds is facilitated.

The gratings N are struck up by perforating or by stamping the sheet which is to form the lining of the casing G. The object is to secure a roughened metallic surface, and this may be accomplished in many ways. The gratings are sheets of thin metal tacked upon or otherwise secured to the inner surface of casing G, thus forming a light inner sheathing. The bodies of the cone and casing are made of wooden staves, thus making it easy to tack or fasten the clothing and plates to them. They may be made of other material and the clothing and sheathing may be screwed or otherwise secured in place.

An obvious modification in the construction of sheets N would be to form each of the same of one thickness of sheet metal having inwardly-extending projections or burrs raised or struck up therefrom.

Blower R is a suction-inducer to assist the material under treatment in its passage through the machine. The inner space of the apparatus is entirely closed from the hopper to the exit to the blower with the exception of the small opening to the spout V.

The brush-surface is continuous and full, although the cones and ridges exist.

What we desire to claim and secure by Letters Patent is—

1. The combination of the casing G, faced interiorly with a roughened or grated metallic sheathing, with an inner cone, H, provided with a continuous metallic brush having the wires thereof of different lengths and forming spiral ridges and depressions, as described, on the surface of the cone, substantially as described.

2. The combination of the casing G, the in-

terior face of which is provided with a sheathing having projections forming a grating-surface, with a cone, H, provided with a continuous metallic-wire brush having the wires thereof of different lengths and forming spiral ridges and depressions, as described, on the surface of the cone, substantially as described.

3. The combination of a casing, G, provided with the opening flap-section G′ and having an inner roughened surface, with the cone H, provided on its outer surface with a brush-clothing, shaft-section E′, and detachable shaft-section E, on which said cone H is mounted, whereby when flap-section G′ is opened the cone H, with shaft-section E, can be removed through the opening without disturbing the pulleys or other parts, substantially as described.

4. The combination of casing G, having a roughened interior surface, and a cone, H, provided with a continuous outer metallic-wire brush having the wires thereof of different lengths and forming spiral ridges and depressions, as described, on the surface of the cone, substantially as described.

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