

(No Model.)

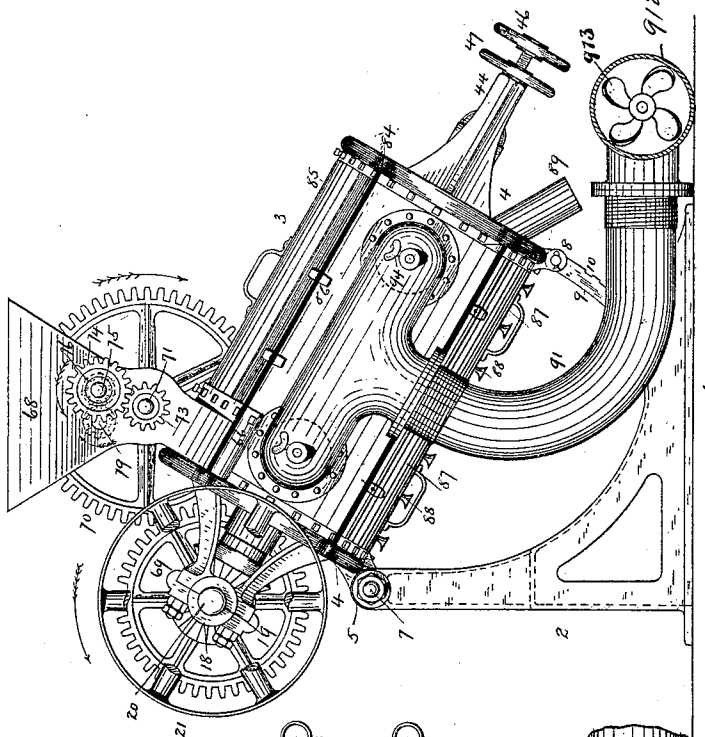
3 Sheets—Sheet 1.

F. W. CROSS.
MACHINE FOR DELINTING COTTON SEED.

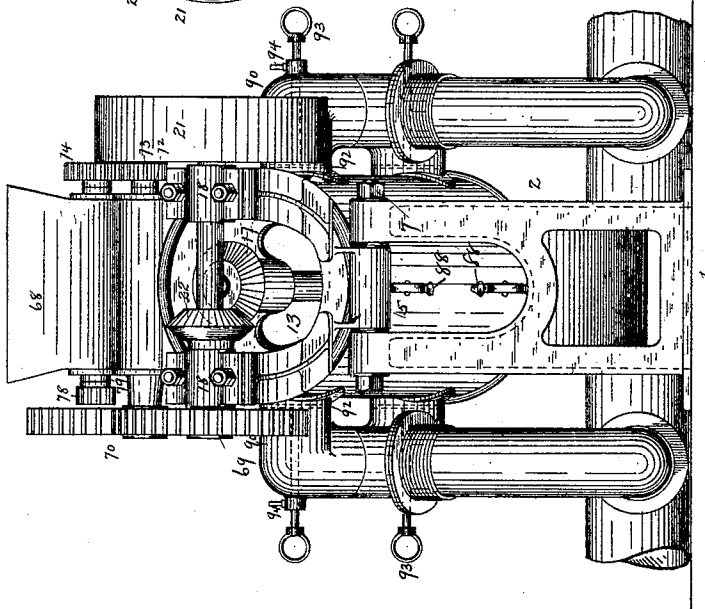
No. 499,873.

Patented June 20, 1893.

—FIG. 2.—



—FIG. 1.—



Witnesses:

Wm. H. H. H.

Wm. H. H. H.

Inventor:

Frank W. Cross

By Attorney:

Frank V. Jones

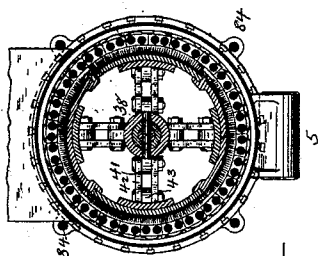
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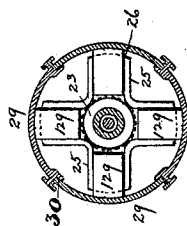
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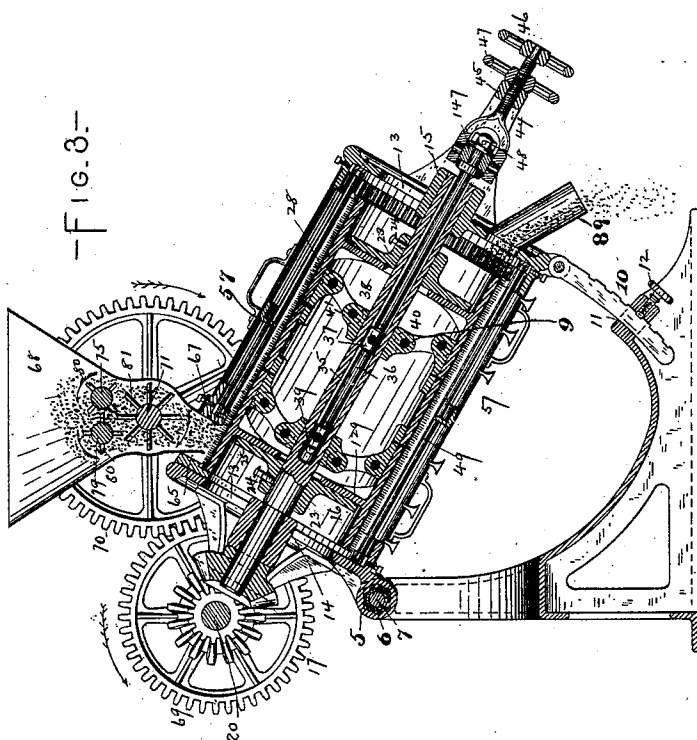
Patented June 20, 1893.



—FIG. 4—



—FIG. 5—



—FIG. 3—

Witnesses:

Wm. H. Norton

Harman H. H. H.

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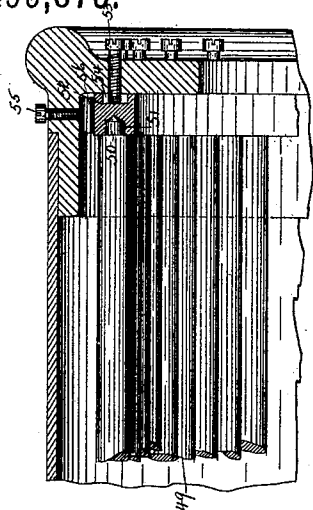
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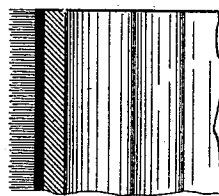
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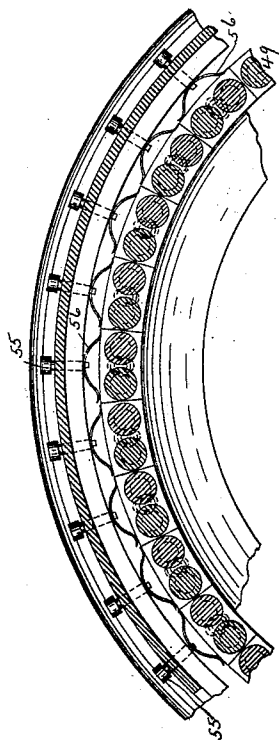
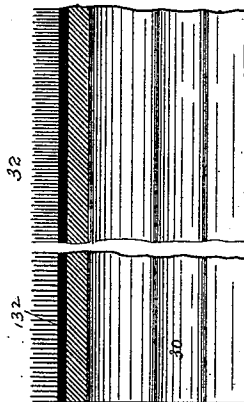
Patented June 20, 1893.



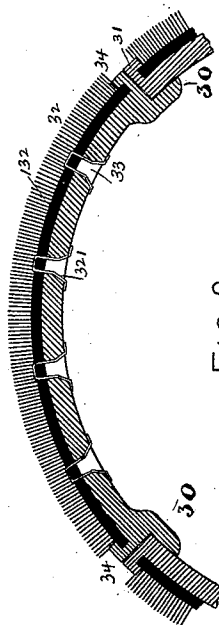
— FIG. 7. —



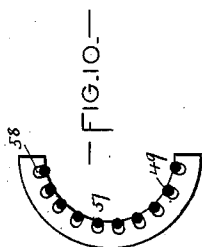
— FIG. 9. —



— FIG. 6. —



— FIG. 8. —



— FIG. 10. —

Witnesses:

Wm. A. Norton
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Inventor:

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UNITED STATES PATENT OFFICE.

FRANK W. CROSS, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-FOURTH
TO JOSEPH SCHLADT, OF WASHINGTON, DISTRICT OF COLUMBIA.

MACHINE FOR DELINTING COTTON-SEED.

SPECIFICATION forming part of Letters Patent No. 499,873, dated June 20, 1893.

Application filed December 28, 1889. Renewed November 28, 1892. Serial No. 453,341. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. CROSS, a citizen of the United States, residing at Baltimore, Maryland, have invented certain new and useful Improvements in Machines for Delinting Cotton-Seed; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in machines for delinting cotton seed, and more particularly to that class of machines in which the seed is fed between a revolving brush and a surrounding abrading surface, and it consists in certain novelty in the construction, arrangement and combination of the various parts of the same, all of which I will now proceed to point out and describe, reference being had to the accompanying drawings, in which—

Figure 1 is an end elevation of a machine embodying my invention; Fig. 2, a side elevation; Fig. 3, a longitudinal section taken through the center of the machine; Fig. 4, a transverse section of the cylindrical casing, revolving brush and surrounding abrading surface; Fig. 5, a detail in section of the brush holding cylinder; Figs. 6 and 7, enlarged details of the rods or rolls forming the abrading surface and adjacent parts; Figs. 8 and 9, enlarged details of brush and holder, and Fig. 10, a detail of the brace for the rolls.

Referring to said drawings: 1 represents the frame of the machine, having at one end an upright bifurcated support, 2.

3 is a cylindrical casing or housing, having heads, 4.

5 is a lug projecting from the under side of the upper head; the said lug may be formed integral with the head or may be made separately and secured thereto in any suitable manner. 6 is an eye formed in said lug. The casing or housing is pivotally secured to the bifurcated support by means of a bolt, 7, mounted in the upper ends of the support and passing through the eye in the lug.

8 is a lug projecting from the under side of the lower head. 9 is a segmental arm pivotally secured to said lug. The said arm 9 is

provided on its outer side with notches, 10, and passes through an aperture, 11, in the lower part of the frame.

12 is a set-screw mounted in the frame, and is adapted to engage with the notches in the segmental arm. By means of this construction the casing or housing may be given any desired inclination for a purpose hereinafter set forth. If desired, the notches in the segmental arm may be dispensed with and the set-screw clamped upon the arm. I, however, prefer to use the notches as there is less chance of accidental displacement.

The heads, 4, are provided with openings, 13.

14 is a bearing formed in the center of the upper head, and 15 a bearing formed in the center of the lower head. 16 is a shaft mounted in said bearings and passing through the center of the casing or housing. The said shaft, for convenience, I will hereinafter designate as the brush shaft.

17 is a bevel gear mounted on the upper end of the brush shaft.

18 are diametrically opposite brackets projecting from the upper head. 19 are bearings formed in said brackets. 20 is a driving shaft mounted in said bearings and having on one end a pulley, 21, which is connected by a belt with any suitable source of power. The said driving shaft is arranged at right angles to the brush shaft, and is provided with a bevel gear, 22, which engages with the bevel gear, 17, and by means of which said brush shaft is operated.

Any desired means may be employed for changing the direction of rotation of the driving shaft, whereby the direction of rotation of the brushes may be changed for a purpose hereinafter set forth.

23 are collars mounted upon the brush shaft and secured thereto by set-screws, 24. The said collars are provided with radial arms, 25, preferably four in number. These collars are located at opposite ends of the casing.

26 are broad grooves in the faces of the arms, 25, so arranged that the grooves on opposite arms face each other.

28 is a cylindrical brush support, formed of segmental plates, 29, each plate being provided with an inwardly projecting arm 129

100

which engages with the grooves in the arms, 25. The meeting edges of the plates are provided on their inner sides with longitudinal lips, 30, which close the space between said plates and prevent any seed from falling between the same. On the outside of the edges of the plates are formed lips or flanges, 31, which engage with the edges of the brush to hold the same in position.

32 is the brush which is formed of wire secured upon a flexible backing 132 of leather or other suitable material. The said brush is made in sections and the edges of each section are placed under the lips or flanges, 31, and are then attached to the holder or support by wires, 321, passing through apertures, 33, in the cylindrical support. While I prefer to attach the brush in this manner, it may, of course, be attached by any other suitable means.

It will be seen that, when the brush is in position, four longitudinal channels, 34, are left between the sections of the same; these aid in carrying the cleaned seed to the bottom of the casing. The lower part of the brush shaft is hollow, being provided with a longitudinal central opening, 35. In the hollow portion of the shaft is mounted a rod, 36, having secured thereto collars, 37, provided with pins or trunnions, 38, which project through slots, 39, in the brush shaft.

40 are collars loosely mounted upon the brush shaft and pivoted to the pins or trunnions, 38.

41 are ears or lugs formed on the collars, 40. 42 are arms or joints pivoted to said lugs or ears, and having their other ends pivoted to lugs or ears, 43, which are rigidly attached to the inner sides of the segmental plates, thus forming substantially a toggle joint connection with the rod.

44 is a casting formed on the lower head of the casing, in which is a screw threaded bearing, 45. 46 is an adjusting screw mounted in said bearing, and provided with a clamping nut, 47. The inner end of said screw is bifurcated, and is pivotally secured to a collar 147, which is loosely mounted on the lower end of the rod, 36, and held thereon by a nut, 48. It will be readily seen that by means of the adjusting screw the rod, 36, may be drawn in or out. When drawn out, the hinged arms, 42, are spread, thus forcing the segmental plates of the brush out, and enlarging the diameter of said brush, and vice versa.

Surrounding the brush and concentric therewith is a cylindrically arranged abrading surface consisting of a series of smooth round rolls or rods, 49, having their ends shouldered and provided with pointed journals, 50, said journals being mounted in bearings, 51, formed in segmental bearing blocks, 52, arranged at each end of the casing or housing and held in place by set-screws, 53, which engage with elongated slots, 54, in their outer sides. Each block supports two rods or rolls. Sufficient space is left between the rods or

rolls to permit the lint to be drawn through the same as hereinafter described, but not large enough to permit the seed to pass between the same.

55 are set-screws mounted in the periphery of the heads of the casing.

56 are springs secured to the inner ends of the set-screws and engaging with the outer faces of the bearing blocks. It will thus be seen that the rods or rolls have a slight radial movement which permits them to yield and allow any foreign substance or bunch of clogged seed to pass, the springs returning the blocks to the desired position. By means of the set-screws the tension of the springs and corresponding radial movement of the blocks can be regulated. By adjusting the set-screws, 53, the rotary movement of the rods or rolls may be regulated.

57 is an annular flange secured to the interior of the casing at about its longitudinal center, and for convenience in construction is made in two parts. The said flange is provided with radial slots, 58, with which the rods or rolls engage; these slots permit a limited outward movement of the rolls, and also act as a brace to prevent the same from becoming unduly bent when the rolls reach the bottom of the slots.

On the top of the casing at its upper end is formed an opening, 65, which is covered by a casting, 66. The top rods of the abrading surface are shorter than the others, and the supporting blocks for the same are secured to the flange, 67, of said casting.

Secured to the casting or formed integral therewith is a feeding hopper, 68, into which the seed is adapted to be placed, passing from the hopper through the opening, 65, and falling upon the brush.

69 is a gear mounted on the driving shaft and engaging with a gear, 70, mounted on a shaft, 71, which passes transversely through the hopper, and is mounted in bearings, 72, on each side of said hopper.

73 is a gear mounted on the opposite end of the shaft, 71, which gear engages with a gear, 74, mounted on the end of a shaft, 75, which also passes through the hopper above the shaft, 71, and is mounted in bearings in the sides of said hopper.

76 is a gear mounted on the opposite end of the shaft, 75; this gear in turn engages a gear, 78, mounted on a shaft, 79, passing through the hopper parallel with the shaft, 75.

Mounted upon and projecting from the shafts, 75 and 79, are radial agitator and separating fingers, 80, which separate the lint covered seed when placed in the hopper in bulk, the fingers on both shafts being of the same length, and arranged to intermesh so as to thoroughly separate the seed.

Mounted upon the shaft, 71, are separating and discharging fingers, 81, of larger size than the fingers, 80; the said fingers 81 take the seed as it falls from the upper separators and force it through the bottom of the hopper into

the annular space between the brush and abrading surface.

The gearing which operates the shafts of the separators is arranged so that the lower separator is driven at a greater speed than the upper ones.

The heads of the casing are connected with each other, and held together by means of brace or tie rods, 84. Preferably four of said rods are employed.

On top of the casing I provide a removable trap or door, 85, extending from the hopper to the lower end of the casing. By means of this door the machine may be cleaned or repaired without taking it entirely apart. The said door is held in position by buttons, 86, but may, if desired, be hinged to the casing or secured in any other manner. 87 are similar traps or doors located on the under side of the casing, and are intended for the purpose of cleaning and repairing.

88 are ventilators having flaring mouths; the said ventilators admit air to the casing and prevent the seed from becoming overheated.

89 is a discharging chute located at the bottom of the lower end of the machine, through which the cleaned seed is discharged. On each side of the cylinder near the top and bottom of the same are lint discharging apertures in which are secured pipes, 90, connected by means of flexible pipes, 91, with a pipe 912 communicating with an exhaust fan 913. Any other preferred form of exhaust mechanism may be employed. The pipes, 90, are provided with suitable valves or dampers, 92, indicated by dotted lines in Fig. 1, the said dampers being operated by rods, 93, having set-screws, 94, for securing said dampers as adjusted. The action of the exhaust fan draws the air out from the interior of the casing, the lint, as it is removed from the seed, being drawn between the rolls or rods forming the abrading surface, then out through pipes where it is discharged into any suitable apartment.

The operation of my invention is as follows: The casing is first set at the desired inclination so as to cause the seed to gravitate from the upper to the lower end of the same; the lint covered seed is then placed in the hopper, the small agitators and separators thoroughly separating the same, so as to prevent it from choking the hopper, and the larger separator and discharger forces the seed into the casing upon the upper end of the revolving brush, which is adjusted so as to leave the required space between said brush and surrounding rolls or rods forming the abrading surface. As the brush revolves it carries the seed with it and into the annular space between the same and the rolls. The said rolls and brush co-act to remove the lint from the seed, the said lint being drawn between the rolls by the action of the exhaust fan and carried into the discharge pipes. The rolls having a smooth surface, offer sufficient frictional resistance

to the brushes to enable them to clean the seed, but do not in any way injure the hull. The said rolls having a slight radial movement, will yield sufficiently to permit any foreign substance or a bunch of clogged seed to pass, the springs returning the rolls to the desired position, when the obstacle is removed. The rolls also are permitted to revolve, and by means of the set-screws engaging with the bearing blocks, the speed of their revolution may be regulated so as to cause them to offer the required frictional resistance. The said smooth surfaced rolls or rods form an important feature of my invention. The seed as it is cleaned moves by gravity from the upper to the lower end of the casing, and is discharged through the chute 89 at the lower end. By means of the segmental arm supporting the lower end of the casing, the said casing may be set at any desired inclination to cause the seed to pass through the machine; this is of great importance. Should it be found that the seed is going through too fast, and is not thoroughly cleaned, the lower end of the machine is raised, causing the seed to take longer to reach the discharge chute and thus be subjected to a more extended and thorough cleaning. If again, it is found that the seed is being heated, by lowering the lower end of the casing the said seed passes through more rapidly, and is prevented from being unduly heated. The ventilators in the bottom of the casing and the openings in the heads of the same supply a sufficient quantity of air to the interior of said casing and also aid in preventing the heating of the seed. By means of the dampers or valves of the pipes leading to the exhaust fan, the power of said exhaust may be regulated. The point at which the exhaust has the greatest effect can also be controlled. This is sometimes of great importance, for instance, in all delinting machines of this class; the tendency of the lint being to clog the brushes and abrading surfaces toward the lower end of the casing. Should this happen, the lower dampers would be open to a greater degree than the upper ones so as to relieve the machine at that point. By means of the upper and lower pipes on each side of the machine, the lint is removed from all parts of the machine and any clogging is effectually prevented. The construction of the casing with the upper and lower traps or doors renders the interior easy of access either for the purpose of cleaning or repairing the same. After the brush has been rotating in one direction for any length of time, the wires of the same are apt to become bent, and are not as effective in their action; by simply reversing the rotation of said brush the wires will be bent back again and this objection overcome; the length of time a brush should run in one direction can be determined by careful observation on the part of the operator. The rolls being mounted in independent blocks can be removed separately without taking the entire

machine apart; this is of advantage in case of breakage or any other accident. So, also, with the brush, as it is made in sections, any part can separately be removed and replaced.

5 By means of the radial adjustment of the brush I am enabled to increase or decrease the annular space between said brush and the abrading surface so as to cause greater friction between the same, causing said brush
10 to have greater or less effect upon the seed.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for delinting cotton seed, 15 the combination with a revolving brush, of a surrounding abrading surface, consisting of a series of smooth surfaced rolls mounted in suitable bearings and having a space or opening between each two adjacent rolls, substantially
20 as shown and described.

2. In a machine for delinting cotton seed, the combination with a revolving brush, of a surrounding abrading surface concentric with the brush and consisting of a series of smooth, 25 round rolls having their ends mounted in suitable bearings, whereby each roll is capable of independent revolution, substantially as shown and described.

3. In a machine for delinting cotton seed, 30 the combination with a revolving brush, of a surrounding abrading surface concentric with the brush, and consisting of a series of smooth, round rolls or rods, having their ends mounted in suitable bearings, and adjustable mechanism for clamping the bearings upon the 35 ends of the rolls or rods, whereby the speed with which they revolve may be regulated, substantially as shown and described.

4. In a machine for delinting cotton seed, 40 the combination with a revolving brush, of a surrounding abrading surface, consisting of a series of smooth, round rolls or rods, having their ends mounted in radially movable bearings, means for limiting the movement of 45 said bearings, and springs for returning them to their normal position, substantially as shown and described, whereby the rolls or rods may have a limited radial movement with relation to the brush.

5. In a machine for delinting cotton seed, 50 the combination with a cylindrical casing or housing, and a revolving brush mounted therein, of a series of smooth, round rolls or rods, surrounding the brush and forming an abrading 55 surface, and having their ends mounted in independent segmental bearing blocks located at opposite ends of the casing, and arranged in circles concentric with the brush, and adjustable clamping set-screws engaging 60 said bearing blocks to hold said blocks or rolls in position, substantially as shown and described.

6. In a machine for delinting cotton seed, the combination with a casing or housing, and 65 a revolving brush mounted therein, of the segmental bearing blocks, 52, arranged in circles at each end of the casing and concentric with the

brush, smooth, round rolls having their ends mounted in said bearing blocks and surrounding the revolving brush, said blocks having 70 elongated radial slots, 54, formed in the outer faces of the same, and clamping set-screws, 53, mounted in the casing and engaging the slots, 54, all constructed, arranged and operating substantially as shown and described. 75

7. In a machine for delinting cotton seed, the combination with a casing and a revolving brush mounted in said casing, of an abrading surface surrounding the brush and consisting of a series of smooth surfaced revol- 80 ble rolls or rods, and suitable exhaust mechanism communicating with the interior of the casing, substantially as shown and described.

8. In a machine for delinting cotton seed, the combination with a casing, of an abrading 85 surface surrounding the brush and consisting of a series of smooth surfaced rolls or rods having a space between each two adjacent rolls or rods, and suitable exhaust mechanism communicating with the interior of the 90 casing on the outside of the rolls or rods, substantially as shown and described.

9. In a machine for delinting cotton seed, the combination with a casing or housing, a hollow shaft mounted therein, radial grooved 95 arms projecting from said shaft, segmental brush plates having inwardly projecting arms mounted in the grooves in the shaft arms, suitable brushes mounted on said plates, longitudinal slots in said shaft, and means for 100 rotating the shaft, of a longitudinally adjustable rod mounted in said shaft, pins projecting from the adjustable rod through the longitudinal slots, and toggle joint connections between said pins and the inner side of the 105 brush plate, all constructed and arranged substantially as shown and described, whereby the brushes may be radially adjusted.

10. In a machine for delinting cotton seed, the combination of a casing or housing 110 mounted on suitable supports, a revolving brush mounted therein, a surrounding abrading surface concentric with the brush, a feed device communicating with the annular space between the brush and abrading surface, and 115 mechanism for adjusting the casing or housing at any desired inclination, substantially as shown and described, whereby the seed will pass through the same at a greater or less degree of speed. 120

11. In a machine for delinting cotton seed, the combination of a frame, and an upright support, of a casing or housing pivoted at its upper end to said support, a segmental arm 125 pivoted to the lower end of the casing and mounted in a bearing in the frame, and a set-screw engaging said arm, whereby the casing may be adjusted at any desired inclination, substantially as shown and described.

12. In a machine for delinting cotton seed, 130 the combination with an inclined casing mounted upon supports, a revolving brush mounted in said casing, a series of smooth, round rolls surrounding the brush and form-

ing an abrading surface, with spaces between said rolls for the passage of the lint, and suitable exhaust mechanism communicating with the interior of the casing on the outside of the rolls, substantially as shown and described.

13. In a machine for delinting cotton seed, the combination with a casing mounted upon suitable supports, and mechanism for adjusting said casing at any desired inclination, of a revolving brush mounted in the casing, a series of independent, smooth, round rolls mounted in bearings and surrounding the brush to form an abrading surface, with spaces between said rolls for the passage of lint, exhaust pipes communicating with the interior of the casing, and provided with valves, mechanism for producing an exhaust through said pipes, and a feeding device communicating with the annular space between the brush and rolls, the casing having a seed discharge aperture at the lower end thereof, all constructed, arranged and operating substantially as shown and described.

14. In a machine for delinting cotton seed, the combination with a casing, a revolving

brush mounted therein and a surrounding abrading surface, of exhaust pipes communicating with the upper and lower portions of the interior of the casing, and on each side of the same, and provided with valves, and suitable exhaust mechanism connected with the exhaust pipes, substantially as shown and described.

15. In a machine for delinting cotton seed, a feed hopper provided with parallel shafts extending transversely through said hopper and having radially projecting and intermeshing separator fingers, 80 mounted thereon, and a lower parallel shaft extending through the hopper below the upper shafts, and having mounted thereon longer radial separator and discharge fingers, said lower shaft being located above the discharge aperture of the hopper, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK W. CROSS.

Witnesses:

T. B. CROSS, Jr.

HOLMES E. OFFLEY.