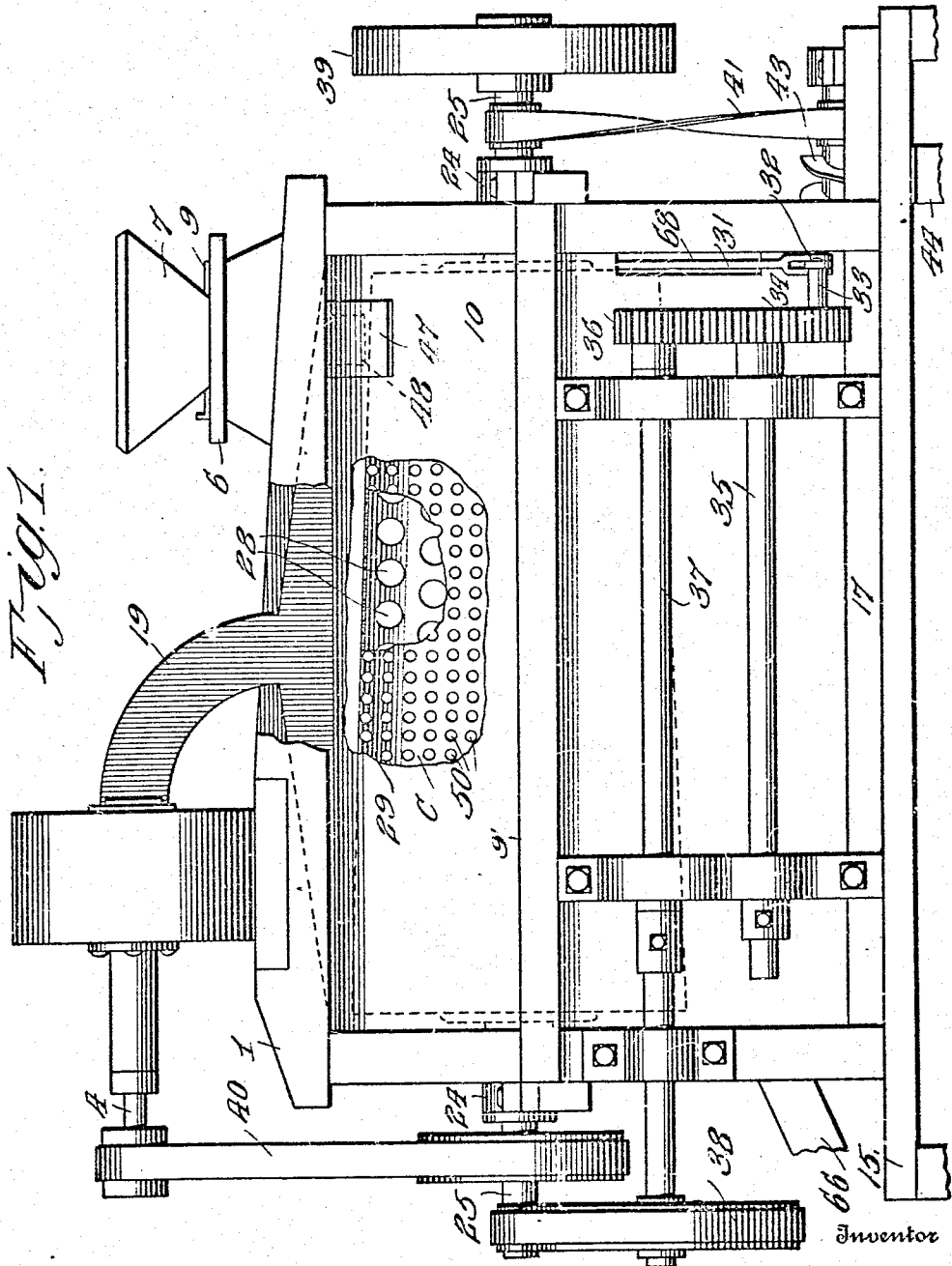


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 DELINTING APPARATUS.
 APPLICATION FILED FEB. 4, 1910.

1,006,939.

Patented Oct. 24, 1911.

4 SHEETS-SHEET 1.



Witnesses
 Frank Hough
 Wm. Baggers

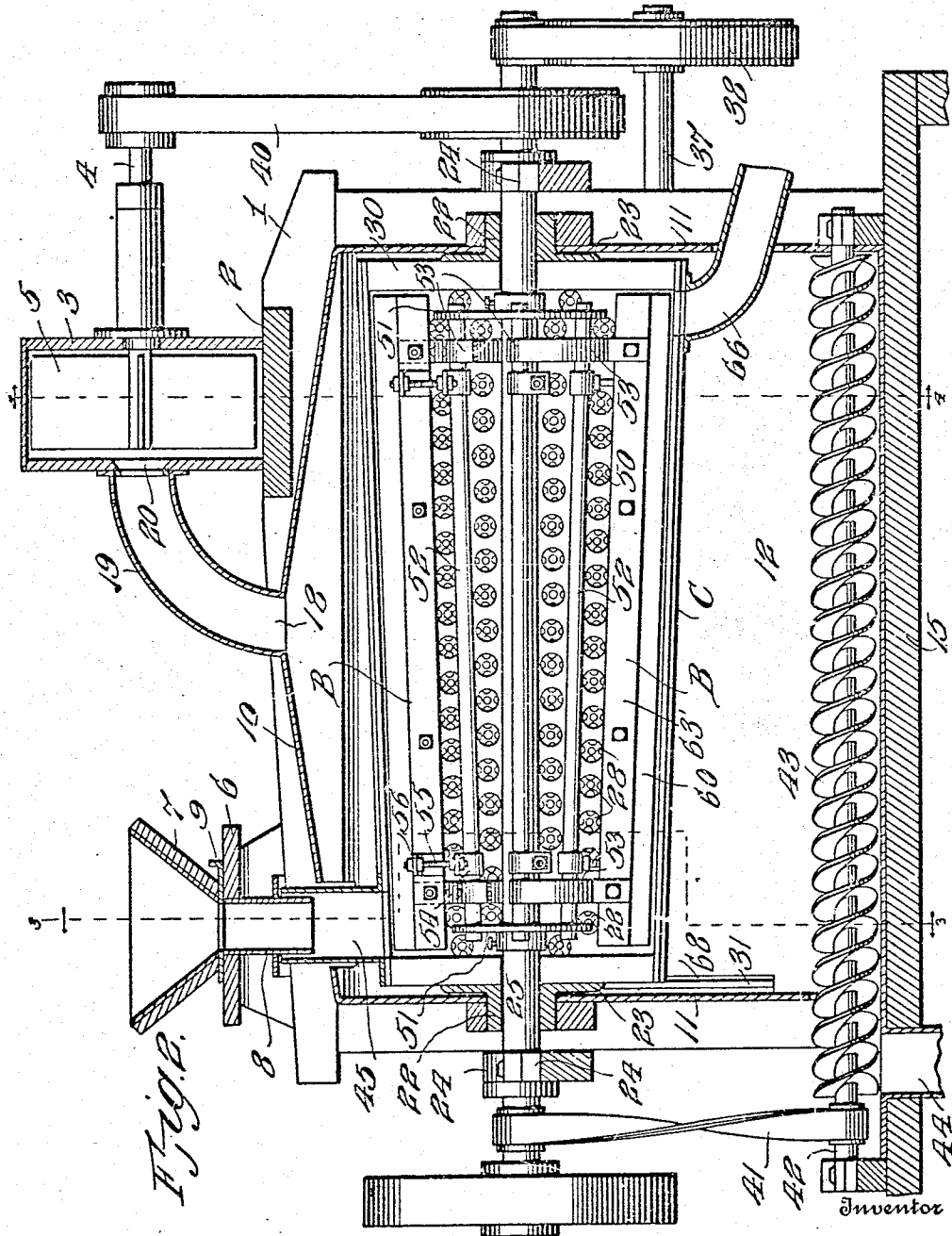
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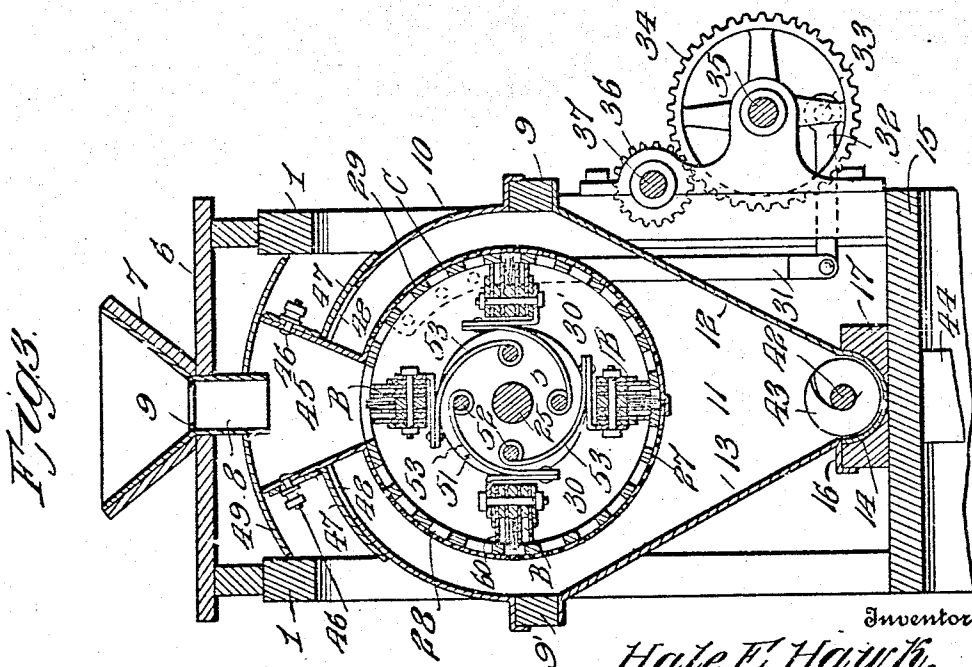
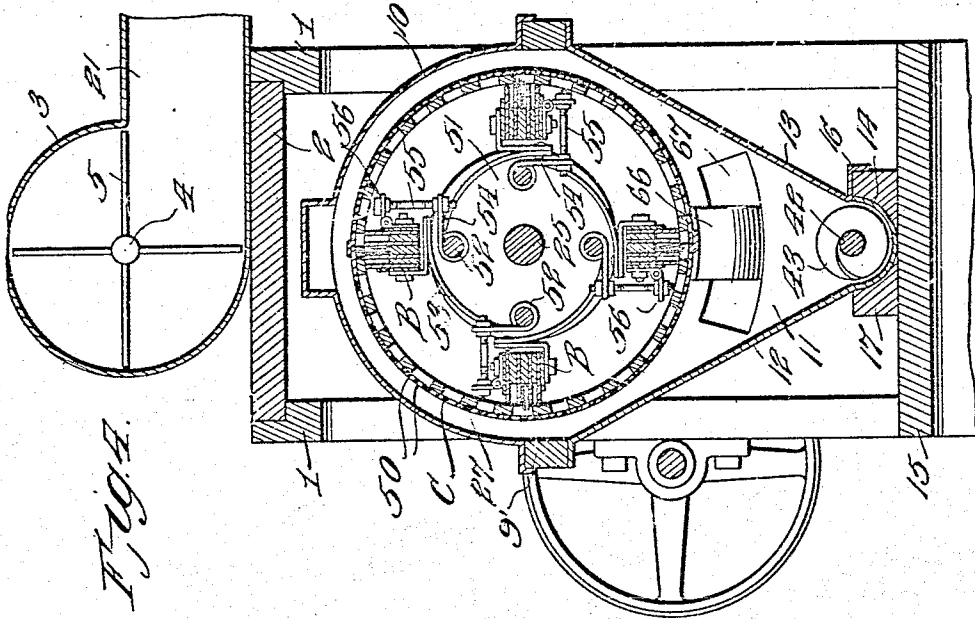
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4 SHEETS—SHEET 3.



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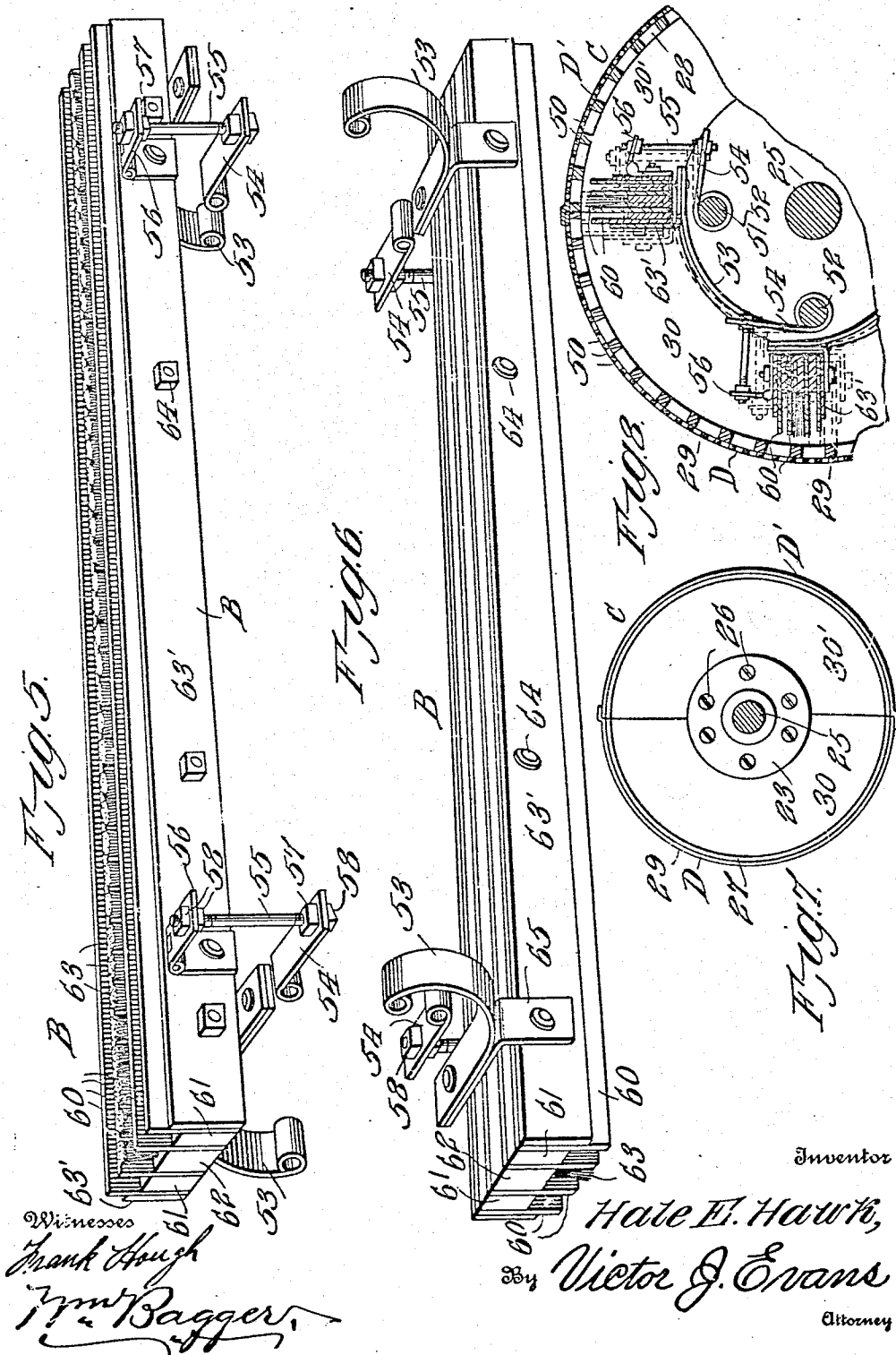
Inventor
 H. E. Hawk,
 By Victor J. Evans
 Attorney

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4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

HALE E. HAWK, OF GREENVILLE, MISSISSIPPI.

DELINTING APPARATUS.

1,066,939.

Specification of Letters Patent.

Patented Oct. 24, 1911.

Application filed February 4, 1910. Serial No. 542,028.

To all whom it may concern:

Be it known that I, HALE E. HAWK, a citizen of the United States of America, residing at Greenville, in the county of Washington and State of Mississippi, have invented new and useful Improvements in Delinting Apparatus, of which the following is a specification.

This invention relates to delinting and separating apparatus, and it has among its objects to produce a machine of simple and improved construction and by the use of which, by a single operation, cotton seed may be delinted, the lint being separated from dirt and impure matter and the delinted seed, the lint and the refuse being separately discharged.

Further objects of the invention are to simplify and improve the construction and operation of a device of the character outlined above.

With these and other ends in view which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the invention may be resorted to when desired.

In the drawings, Figure 1 is a side elevation of an apparatus constructed in accordance with the invention, parts being broken away in order to expose the subjacent construction. Fig. 2 is a longitudinal vertical sectional view. Fig. 3 is a transverse sectional view taken on the line 3—3 in Fig. 2. Fig. 4 is a transverse vertical sectional view taken on the line 4—4 in Fig. 2. Fig. 5 is a perspective view, showing one of the brush members and the supporting means for the same detached. Fig. 6 is a perspective view, showing the same in inverted position. Fig. 7 is an end view of the casing constituting the delinting and separating screen. Fig. 8 is a sectional view taken transversely through the shaft and the screen casing, showing in full and in dotted lines, respectively, the position assumed by the

brushes when the machine is at rest and when it is in motion.

Corresponding parts in the several figures are denoted by like characters of reference.

The frame of the improved machine includes longitudinal top rails 1 connected by the cross piece 2 supporting a casing 3 in which a shaft 4 carrying a fan 5 is supported for rotation. The top rails 1 also support a cross bar 6 upon which is mounted a feed hopper 7 having a spout 8 and equipped with a cut-off 9. The frame structure is also equipped with side rails 9' serving to support a hood 10 of approximately semi-cylindrical form, said hood constituting the upper part of the exterior casing of the machine, the lower part of said casing being formed by end members 11 and by downwardly converging side members 12 and 13, the former of which is curved adjacent to its lower edge to form a trough 14 extending longitudinally of the machine, being supported upon the base 15. The side member 13 is detachably connected with the underside of one of the side rails 9, and it is provided adjacent to its lower edge with an offset or shoulder portion 16 adapted to be seated upon a longitudinally grooved block 17 wherein the trough 14 is seated to reinforce the latter. The side member 13, as well as the hood of the casing, is preferably supported in such a manner as to be readily detachable to afford access to the interior. The hood 10 is provided with an aperture 18 connected by a wind trunk 19 with the eye or inlet 20 of the fan casing, which latter is provided with a peripheral outlet 21.

The frame structure of the machine is provided at the ends thereof with boxes affording bearings wherein hubs or flanges 22 extending from disks 23 are supported for oscillation, said hubs combining with boxes 24 supported upon the frame structure, to afford bearings for a longitudinal shaft 25. The disks 23 are secured by suitable fastening means, such as screws or bolts 26, upon the end members of the screen casing C, which latter will thus be supported in such a manner as to be capable of rocking or oscillating within the outer casing which has been previously described.

The screen casing, which as a whole has been designated by C, is of tapering cylindrical or conical shape. The screen casing C is longitudinally divided into two halves or

sections D and D'. The screen casing, moreover, is composed of an inner, so called, retarding cylinder 27 made of sheet metal with a smooth inner surface and provided with apertures 28, which latter may be of any suitable shape, either round, oblong, rectangular or otherwise, and of such dimensions to easily accommodate a seed, said apertures serving in connection with the outer screen cylinder 29 to form seed receiving pockets, the depth of which will be regulated by the thickness of the sheet metal of which the retarding cylinder is composed, said retarding cylinder and the screen cylinder 29 being suitably connected together so as to lie practically in contact with one another. The screen cylinder 29 may be constructed of perforated sheet metal or other foraminous material, the openings 50 in said screen cylinder being of such dimensions as to positively prevent seed from passing there-through, while not interfering with the passage of refuse or of lint detached from the seed.

The sections D and D' of the casing C are provided with semi-circular head or end members 30 and 30' that receive the screws or fastening members 26, whereby the heads or ends of the casing are connected with the disks 23, said disks and fastening members serving also to connect the end members 30 and 30' of the casing sections D and D' detachably together, thus enabling each of said sections to be disconnected by detaching the fastening members connecting its ends with the disks 23.

The casing C is provided with an arm 31 which is suitably attached to one of the ends thereof, said arm being connected by a pitman 32 with a wrist pin 33 connected with a spur wheel 34 which is mounted upon a shaft 35 supported in suitable bearings longitudinally of the frame of the machine. The spur wheel 34 meshes with a pinion 36 upon a longitudinally disposed shaft 37 which is connected by a transmission belt 38 with the main shaft 25, the latter being provided with a band wheel 39 to enable it to be driven by power derived from any suitable source. The main shaft 25 is connected by a transmission belt 40 with the fan-carrying shaft 4 which will thus be driven at a sufficient rate of speed for the purpose of the invention. The main shaft 25 is also connected by a transmission belt 41 with the shaft 42 of a spiral conveyer 43 disposed in the trough 14, which latter is provided with an outlet 44.

The casing C is provided adjacent to its small end with an inlet chute 45 which receives the spout 8 of the feed hopper 7, said inlet chute being of sufficient width, as clearly shown in Fig. 3 of the drawings to prevent it from contact with the spout 8 when the casing C is being rocked or oscil-

lated by the motion of the pitman 32 connected with the arm 31.

Adjustably secured upon the side walls of the chute 45 by means of fastening members, such as bolts 46, are shields 47 adapted to overlap the opening 48 which is formed in the hood 10 for the passage of said chute, thus preventing said opening from being partially uncovered when the machine is in operation. A shield or cover member 49 is mounted upon the spout 8 to overlap the upper end of the chute 45 to keep material that is being fed from splashing out and being spilled when the machine is in operation. The feed hopper 7, as previously described, is provided with a cut-off 9 whereby the feed may be quickly interrupted when desired.

The main shaft 25 is provided within the casing C and at suitable distances from the heads or ends of the latter with disks 51 which are connected together by means of rods 52 extending longitudinally through the casing, said rods being disposed in parallel relation with the walls of the casing C. The brush members B, the detailed construction of which will be presently more fully described, are mounted upon arms 53 of arcuate shape, said arms being suitably mounted or supported upon the rods 52 from which they are curved outwardly, as will be plainly seen in Figs. 3 and 4. The rods 52 are provided with auxiliary arms 54, each of which is adjustably connected by a bolt 55 with a lug or leaf 56, the latter being hingedly connected with the brush member B which is supported adjacent to the rod 52 having the arms 54 by the arcuate arms 53 extending from the next or proximate rod 52. The bolts 55, as will be best seen in Figs. 4, 5 and 6, are provided with jam nuts 57 and with clamp nuts 58, each pair of nuts clamping between them one of the arms 54 and one of the lugs or leaves 56 so that, by proper adjustment of the nuts upon the bolts, the distance between the auxiliary arms 54 and the brush members B supported adjacent thereto by means of the arms 53 may be varied. At the same time, the brush members will in the manner herein described be yieldingly supported so that when the shaft 25 carrying the rod, supporting disks 51 is rapidly rotated, the brush members B will by the centrifugal action thus generated be thrown forcibly in an outward direction and into engagement with the interior surface of the casing C.

Each of the brush members B is made up of a plurality of strips 60 of vulcanized fiber, leather or other durable and resilient material, said strips being spaced apart by partition members 61 and 62, one of which 62 is equipped with a brush 63 which may be advantageously made of steel or other resilient wire. Side strips 63' of metal are

disposed adjacent to the outermost resilient strips 60, said side strips or side members being of a width exceeding that of the partition members so as to afford adequate protection for the proximate resilient strips 60. The strips 60, the partition members 61, 62 and the protecting strips 63 are connected together by fastening members, such as bolts or rivets 64, extending transversely there-
 10 through, and each of the brush members is equipped with metallic brackets 65 whereby they may be securely mounted upon the supporting arms 53. The casing C is provided adjacent to its large end with an outlet
 15 spout 66 that extends through an arcuate slot 67 in one of the end members 11 of the outer case. One of the inclined side members of said casing is also provided with a slot 68 for the passage of the arm 31, where-
 20 by the casing C is rocked or oscillated, as previously described.

In the use of the improved machine as a delinter, the seed are fed through the hopper 7 and spout 8 and the chute 45 into the casing C, rotary motion being at the same time transmitted to the fan carrying shaft 4 and to the conveyer shaft 42, while a rock-
 25 ing or oscillatory movement is being imparted to the casing C. The seed will enter the pockets formed by the openings 28 in the inner or retarding cylinder 27 in connection with the outer or screen cylinder 29 and will remain momentarily seated in said pockets while being subjected to the action
 30 of the delinting brushes B, the brush members of which 63 will serve to forcibly detach the lint, while the resilient strips 60 will exercise a scouring and polishing action. It will be understood that the delint-
 40 ing operation is not performed by the scouring action of either of the screens, but entirely by the action of the brush members. The seeds, while being subjected to such action, remain seated in the pockets or aper-
 45 tures of the retarding cylinder, and the brush members will thus in a very effective manner detach the lint from the seeds, the brushes being saved from wear, and unneces-
 50 sary friction and loss of power being avoided owing to the fact that the inner surface of the retarding cylinder, which is composed of sheet metal, as hereinbefore set forth, is perfectly smooth, offering no resist-
 55 The feed movement of the seed through the retarding cylinder is accomplished partly by the seeds being tilted out of the pockets or apertures at the moment when they are being disengaged by the brushes, and partly
 60 by the rocking or oscillatory movement of the screen cylinder which assists in the disengagement of the seeds from the pockets and in feeding the seeds along the screen cylinder toward the narrow or contracted
 65 discharge end. The brush members will ob-

viously be held yieldingly in engagement with the inner wall of the casing, owing to the centrifugal action whereby when the machine is in operation they are forced out-
 70 wardly with reference to the axial supporting shaft, and by proper adjustment of the brush members with reference to the spacing arms 54 and supporting arms 53 by means of the nuts upon the connecting bolts
 75 55 the contact between the brush members and the wall of the casing is capable of regulation. The feed movement of the seed will obviously tend in the direction of the large end of the casing C, said feed move-
 80 ment being caused by the action of the brush members, whereby the seed will be tilted into and from the pockets of the casing, and said feed movement being further accelerated by reason of the oscillatory
 85 movement of the casing. The seed is compelled to pass through the full length of the casing from the small end where the feed inlet is located and to the large end where the exit spout is located, and each seed will
 90 thus be subjected to a very thorough delinting action by the brush members.

The action of the exhaust fan 5 will create within the outer casing a partial vacuum, causing the atmospheric pressure of the air entering the screen casing along with
 95 the seed to force the lint out through the apertures in the outer or screen cylinder 29, together with the dirt and refuse, the suction being so regulated that the dirt and refuse will settle by gravity in the trough
 100 14 where by the action of the spiral conveyer 43 it is conveyed to the exit 44, while the lint will remain suspended in the air passing through the wind trunk 19 and the fan casing to the outlet 21, whence it may
 105 be conveyed through a suitable duct to a condenser or to a collector of the cyclone or any other well known type.

It will be seen that by the apparatus as herein described, cotton seed may be delinted, scoured and polished, and the lint, the seed and the refuse will be separated from each other, the seed being discharged
 110 through the exit spout 66. By a very simple modification, the same machine may be utilized for the purpose of separating the kernels from the hulls of delinted cotton seed after the latter has been crushed
 115 by such means as are usually provided for the purpose. When the machine is to be used for separating the meats from the hulls of crushed seed, the retarding cylinder 27 is simply omitted from the construction, the apertures in the screen cylinder being
 120 of such dimensions that the meats will readily pass therethrough, while the hulls are retained within the cylinder 29 to be conveniently discharged through the spout 66. When a machine is used in this man-
 125 ner, the fan may also be disconnected, 130

although this is not essential, since the suction created by the fan may be of assistance in causing the meats to pass through the screen apertures. The meats, however, will be permitted to drop by gravity into the trough 14 from whence they are discharged by the spiral conveyer 43 through the exit 44.

Having thus described the invention, what is claimed as new, is:—

1. In a device of the character described, an exterior casing, a screen casing supported for oscillation within the same, means for imparting a rocking movement to said screen casing, a revoluble shaft extending axially through the screen casing, a brush element carried by the shaft, means for feeding material into the screen casing, means for discharging separated material from said casing, and means for exhausting air from the exterior casing to create a partial vacuum within the same.

2. In a device of the character described, an exterior casing, a screen casing supported for oscillation therein, means for imparting a rocking movement to said screen casing, a revoluble shaft extending axially through the screen casing, a brush element yieldingly supported by the shaft, means for feeding material into the screen casing, means for discharging separated material from the latter, and means for exhausting air from the exterior casing.

3. In a device of the character described, an exterior casing having a trough at the bottom thereof, a spiral conveyer operating in said trough, a screen casing supported for oscillation within the outer casing, means for rocking the screen casing, a revoluble shaft extending axially through the screen casing, a brush element yieldingly supported by the shaft, and means for feeding material to and for discharging material from the screen casing.

4. In a device of the character described, an exterior casing, a screen casing supported for oscillation therein and having a feed chute extending through the exterior casing, the latter being provided with a slot for the passage of said chute, wing members connected adjustably with the feed chute and overlapping the slot, a feed hopper supported above the chute and having a spout extending into the latter, a discharge spout connected with the oscillatory screen casing and extending through an arcuate slot in the exterior casing, a trough within the exterior casing and having an outlet at one end, a spiral conveyer in said trough, a shaft extending through the screen casing, brush elements yieldingly connected upon said shaft, and means for exhausting from the outer casing air laden with light material discharged through the apertures of the screen casing.

5. In a device of the character described, a longitudinally divided cylindrical screen casing, the halves or sections of which are provided with end members, disks secured upon the end members and connecting the same, said disks being provided with hubs, a shaft supported for rotation in said hubs, bearings for said hubs, an arm extending radially from the screen casing, means connected with said arm to impart a rocking motion to the screen casing, and a brush element carried by the shaft.

6. In a device of the character described, a longitudinally divided cylindrical tapering screen casing, the halves of which are provided with end members, disks secured upon said end members which are thereby connected, said disks being provided with hubs, bearings engaging said hubs to support the casing for oscillation, means for rocking the screen casing, a shaft supported for rotation in the hubs, and a brush element carried by the shaft.

7. In a device of the character described, a frame, an exterior casing, a longitudinally divided screen casing, connecting disks upon the ends of the screen casing, said disks being provided with hubs supported in bearings upon the frame, a shaft supported for rotation in the hubs and carrying a brush element interiorly engaging the screen casing, means for feeding material into the screen casing and for discharging material from said screen casing and from the exterior casing, means for creating in the exterior casing a partial vacuum, means for rotating the brush-carrying shaft, and means for oscillating the screen casing.

8. In a device of the character described, a screen casing, a revoluble shaft extending axially therethrough, disks upon said shaft, rods supported by said disks in parallel relation to the walls of the screen casing, arcuate brush carrying arms supported upon the rods, auxiliary arms extending from the rods, and means for adjustably connecting the auxiliary arms with the brush elements carried by the arcuate arms.

9. In a device of the character described, a tapering screen casing, a revoluble shaft extending axially therethrough, disks upon said shaft, rods supported by said disks in parallel relation to the walls of the casing, arcuate arms extending from the rods, brush elements carried by said arms, auxiliary arms extending from the rods, hinge leaves extending from the brush elements, and means for adjustably connecting said hinge leaves with the auxiliary arms.

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

HALE E. HAWK.

Witnesses:

W. P. KINCHMER,
J. A. CRITTENDEN.