

(No Model.)

J. J. FAULKNER.
COTTON SEED DELINTER.

4 Sheets—Sheet 1.

No. 562,517.

Patented June 23, 1896.

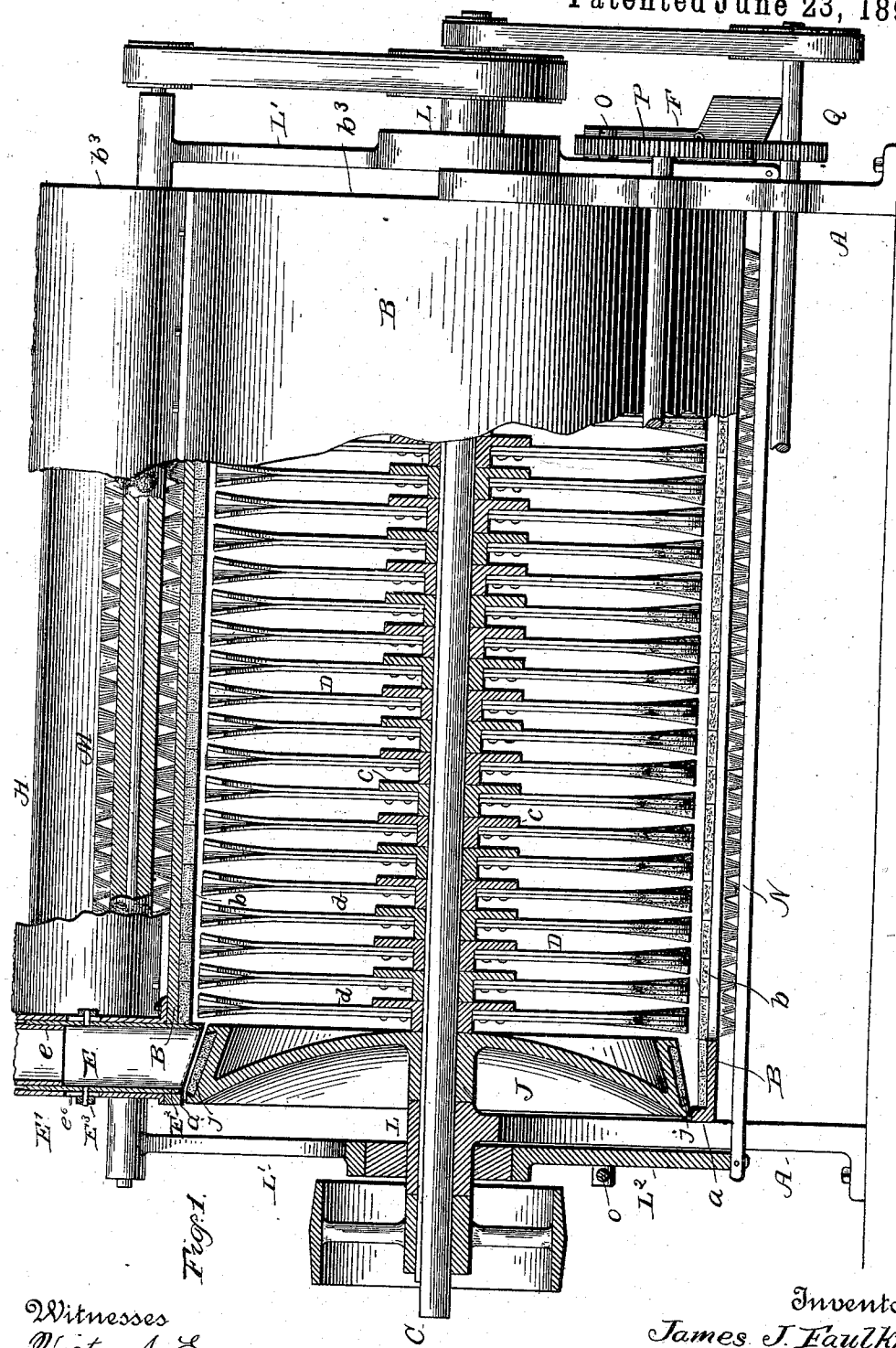


Fig. 1.

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(No Model.)

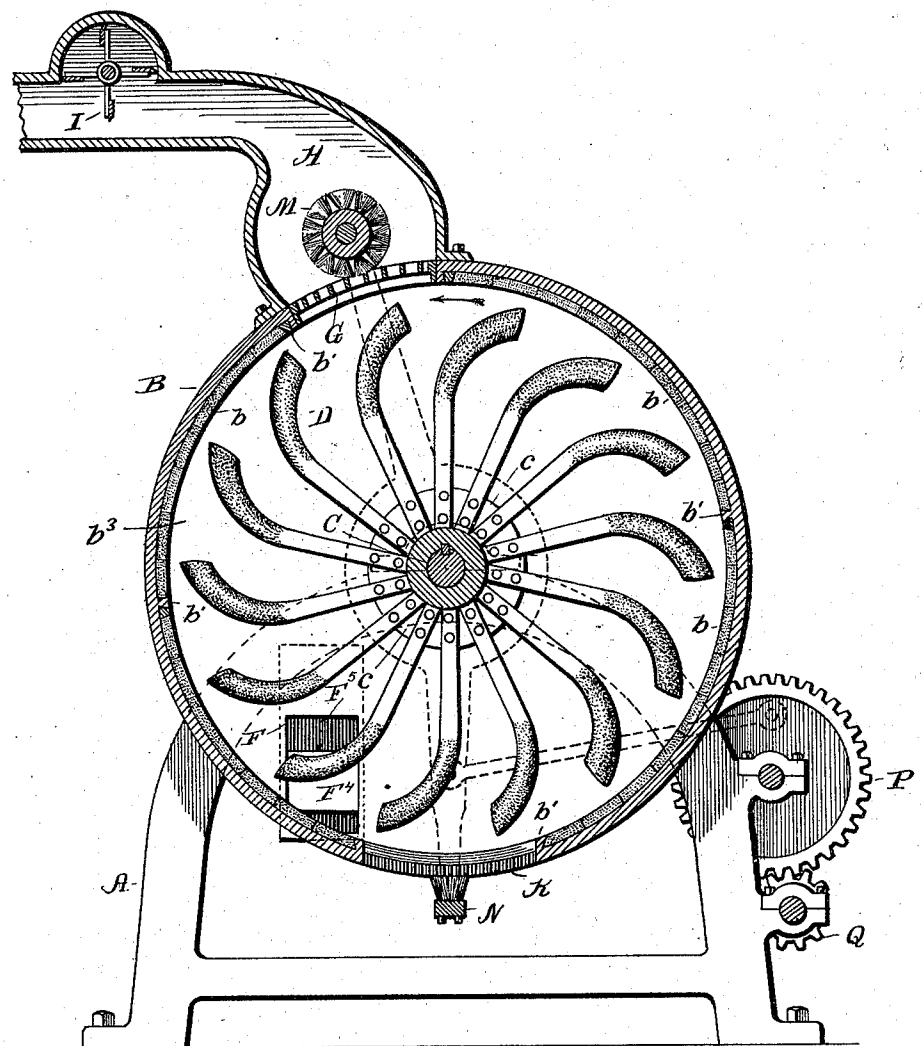
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Fig. 2.



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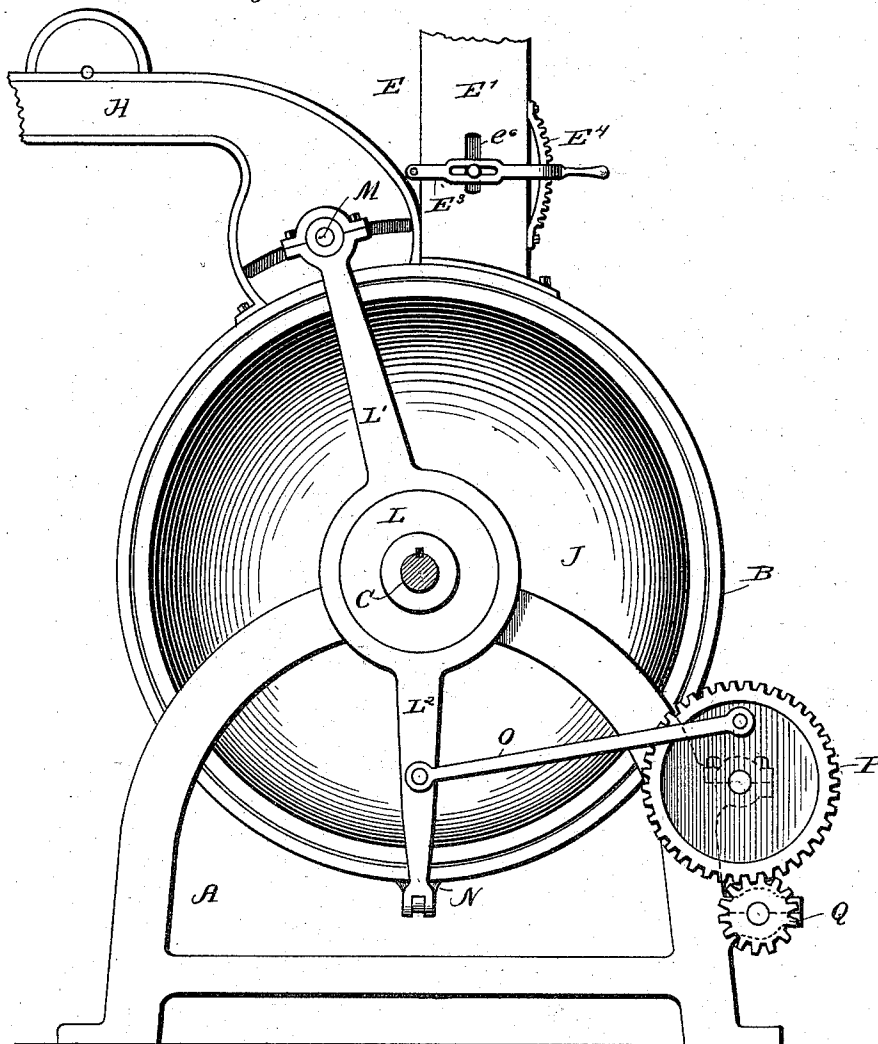
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Fig. 3.



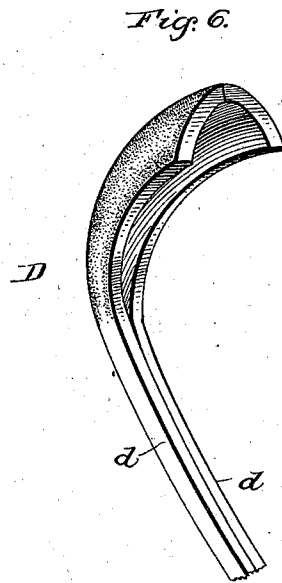
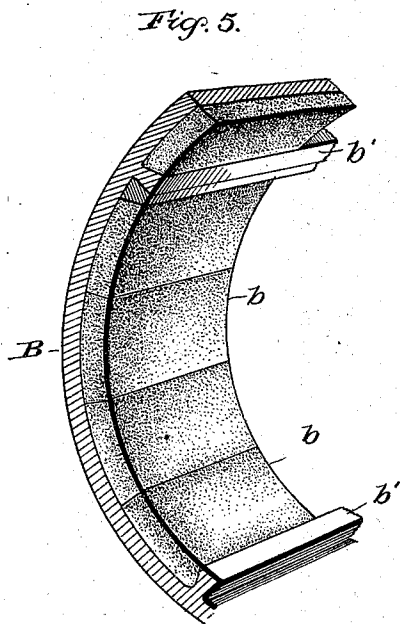
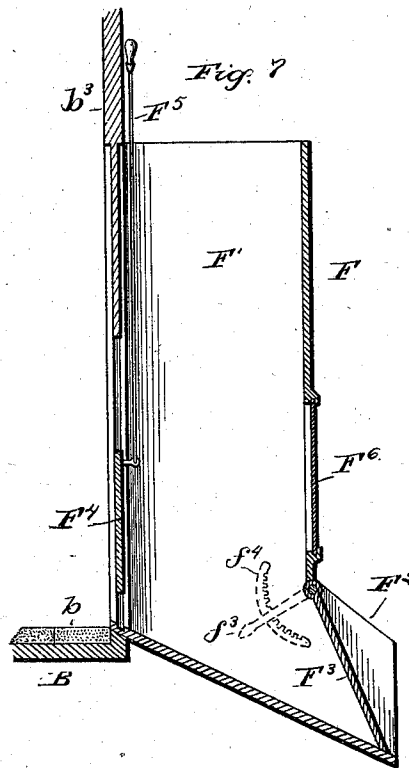
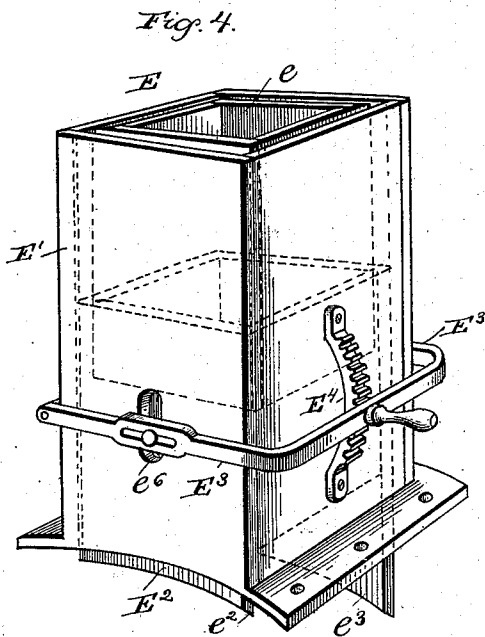
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UNITED STATES PATENT OFFICE.

JAMES J. FAULKNER, OF MEMPHIS, TENNESSEE, ASSIGNOR TO THE STANDARD COTTON SEED COMPANY, OF ARKANSAS.

COTTON-SEED DELINTER.

SPECIFICATION forming part of Letters Patent No. 562,517, dated June 23, 1896.

Application filed January 16, 1896. Serial No. 575,750. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. FAULKNER, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Cotton-Seed Delinters; 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 in treating cotton-seed, and particularly to improvements in that class thereof known as "delinters;" and it consists in the improved cotton-seed delinter whose construction and arrangement of parts will be hereinafter described, and particularly pointed out in the claims.

The object of my invention is to provide a cotton-seed delinter which shall be more simple in construction than any which have heretofore been made, and the parts of which shall be so adapted in form and material to the nature of the use to which they are subjected that comparatively little wear will take place in the continued active operation of the machine, and so that those parts which do become worn may be readily removed and replaced.

The machine which I have constructed to fulfil the above-mentioned object of invention belongs to what may be termed the "arm type" of cotton-seed delinters—that is to say, a delinter in which the revolving abrading-surface consists of a number of arms mounted upon a central shaft, and formed at their outer ends to present an abrading-surface. This type of machine I believe to be the most economical of power, as the frictional loss occasioned by the revolution of the abrading-surface is here at a minimum. The capacity of machines of this type is also very large, when such machines are properly constructed, because the character of the abrading action to which the seed under treatment is subjected is peculiarly adapted to remove the lint rapidly from the face of the seed under treatment. The abrading contacts are of but momentary duration, though quite sufficient to thoroughly scour the face of the seed pre-

sented to such action, and they are repeated again and again until the faces of the seed have been thoroughly cleansed and the lint removed therefrom. The natural spring or rebound of the seed under treatment after the abrading contacts is sufficient to cause the seed to change its position in the roll which the seed forms around the inner surface of the casing while under treatment in the machine, so that new faces are constantly presented to the abrading action. In machines of this type there has always been difficulty in arranging for a proper feed of seed to the machine. The only practical way of feeding cotton-seed to a cotton-seed delinter is through an upright pipe which opens into the interior of the casing provided therefor. When, however, arms mounted upon the central shaft are used as the revolving abrading-surface, it is evident that some means other than such arms must be provided under the feed-opening to control the feed of the seed to the machine. Otherwise either constant watch would have to be kept as to the quantity of seed under treatment in the machine, or the machine would be liable to be choked and its operation interrupted.

One of the novel features of the machine which forms the subject-matter of this application consists in an improved device by means of which the flow of seed into the machine can be controlled and regulated in any desired manner. Upon the central shaft, directly under the feed-opening, I mount a disk whose periphery is inclined or beveled toward the interior of the machine, and is further so formed as to present a continuous abrading-surface. In connection with this disk I use a telescopic feed-pipe, the moving section of which is adapted when in its lower position to rest upon the periphery of the disk thus mentioned. The lower end of the said moving section is inclined to correspond with the inclination of the beveled surface of this disk, so that a close fit may be obtained. I am thus able to control the amount of seed conveyed into the machine by regulating the distance between the lower end of the moving section of the telescopic feed-pipe and the periphery of the disk mounted upon the central shaft. When the lower end of such moving section

contacts with the periphery of the disk, the feed of seed into the machine is entirely interrupted, but it is only necessary to raise such moving section slightly in order to provide for the passage of a considerable amount of seed into the machine.

A further feature of novelty in my present machine consists in the form of stand-pipe which I have devised to control the discharge of the seed from the machine.

In an application for Letters Patent filed May 4, 1895, Serial No. 548,146, I have described a cotton-seed delinter in which the seed is discharged from the machine through what I have termed a "stand-pipe." This stand-pipe consists of an upright pipe, stationed, preferably, at the discharge end of the machine, which is in direct communication with the interior of the casing through an opening therein. Into this pipe seed banks up when the amount of seed under treatment in the machine is so great that there is not sufficient space in the abrading-inclosure to accommodate the entire bulk of the seed under treatment. The downward pressure of the seed in the stand-pipe, acting backward through the machine, serves to regulate the flow of seed into the machine and to increase the intensity of the scouring action to which the seed under treatment is subjected, so that the seed as it is finally discharged through the discharge-opening, which is stationed at the base of the stand-pipe, is thoroughly cleansed.

In the form of the stand-pipe described in the application above referred to no means are provided for permitting the seed which has once risen into the stand-pipe to be discharged from the same until the feed of seed to the machine has been interrupted. With a view to removing this difficulty, and also for rendering more uniform the condition of seed under treatment in the machine, I have in my present construction formed in the discharge end of the casing an opening, which extends to the periphery of such casing on the outer face of the end or head of the casing. In free communication with the opening thus formed I place an upright pipe, which corresponds to the stand-pipe of my former construction, in whose lower end is formed a valved discharge-opening. I partially close the opening formed in the end of the casing by means of a valve, which may be adjusted in its position.

Bearing in mind then the fact that cotton-seed, when under treatment in a cotton-seed delinter, lies in the form of a roll around the inner surface of the casing, it will be seen that the cotton-seed at the discharge end of the machine will pass through the opening formed in the end of the casing at or near the periphery of the same, and will bank up in the stand-pipe until it reaches the top level of the valve fitted in such opening, when it will redischARGE into the casing and undergo a renewed abrading action. This action, taking place continually, assists in the thorough

agitation of the seed in the machine, and insures a perfect product.

Other novel features of my machine relate to the form of the abrading-surfaces which I use in my present construction, and to the means which I adopt for removing the lint which is scoured from the seed by the action of the machine, and for freeing the interior of the casing from the dirt which naturally gathers therein during the course of the delinting operation.

My invention is fully illustrated in the drawings which accompany and form a part of this application, in which the same reference-letters refer to the same or corresponding parts, and in which—

Figure 1 is a longitudinal section of my machine. Fig. 2 is a central vertical section of the same. Fig. 3 is an end view showing the mechanism employed to operate the revoluble brush which travels over that portion of the surface of the casing through which the lint is removed. Fig. 4 is a detail view of the feed-pipe, showing the construction of the same. Fig. 5 is a detail view of a portion of the casing, showing the manner in which abrading-block sections are held in place thereon. Fig. 6 is a detail view of one of the abrading-arms. Fig. 7 is a detail view of the discharge stand-pipe.

Referring to the drawings, A represents the machine-frame. By this frame is supported the casing B, which forms the inclosure within which the entire delinting operation of the machine takes place, and in it are also formed journals for the central shaft C, to which are secured the abrading-arms D. Seed is fed into the machine through a feed-pipe E, stationed at the head end of the machine, and is discharged therefrom through a discharge stand-pipe F, stationed in the head of the casing at the discharge or tail end of the machine. The lint which is scoured from the surface of the seed by the action of the abrading-surfaces is removed through the perforations G, formed in the casing at the top of the machine, by the action of the exhaust-air current, caused to exist in the air-flume H by the action of the exhaust-fan I.

In the construction of cotton-seed delinters it is necessary to provide, first, abrading-surfaces to effect the desired scouring action; second, feeding and conveying means for supplying the machine with seed and keeping the seed properly distributed through the same; third, means for discharging the cleansed seed from the machine in quantities regulated by its condition; fourth, means for removing the lint separated by the action of the machine; fifth, means for removing the dirt which constantly gathers in the casing in the course of the delinting operation.

In a detailed consideration of my machine which will now follow, the parts thereof will be considered in the order indicated, after which the operation of the machine as a whole will be stated.

I. *Abrading-surfaces*.—The abrading-surfaces which I use in my present construction consist of the revolving arms D and the emery lining of the inner surface of the casing.

5 The abrading-arms D are formed of two strips of iron, or other suitable material *d*, in width preferably not exceeding two inches, which at their lower ends are placed face to face and are held together, so as to constitute practically one piece, but at the upper ends are flared outwardly, so as to form a V-shaped section with the sharp edge toward the direction of the rotation of the arms, and are bent so as to present the upwardly-curving form

10 which has been found most desirable for all delinting and scouring actions. It is not essential that these arms be made of two pieces, as described, but it is necessary that they be broadened at their outer ends and bent on each side away from the casing, so as to form outwardly-flared A-shaped abrading portions, the hollowed surfaces of which face inwardly. The arms are secured at their lower end to the flanged disks *c*, which are mounted upon

15 the central shaft and suitably secured thereto. A number of these arms are secured to each disk, as thereby the capacity of the machine is increased. The disks can, however, be readily removed from the shaft, so that any necessary repair can be easily and rapidly made. I coat the outer end of the abrading-

20 arms with emery by the process described in Patent No. 557,065, granted to me on March 24, 1896, so that they have the desired abrading-surfaces. The sharp edge of the active portion of the abrading-arms enables them to move easily through the mass of seed which they treat, while the sloping sides of the same render the scouring action thorough. Cotton-

25 seed, when under treatment in a delinter, is held by centrifugal action in the form of a roll around the inner surface of the casing, so that it is always in place to be subjected to the action of the abrading-arms. The natural elasticity or rebound of the seed causes it to spring outward after each contact with the abrading-arms, so that new faces of the seed are constantly presented to the abrading action, and the maximum amount of abrading

30 is effected by a minimum amount of power, the frictional loss due to power necessarily exerted in causing the revolution of the abrading-surfaces being very slight in machines of this type.

35 The abrading-surface of the casing is formed by a series of smooth-surfaced abrading-blocks *b*, which are held in position between the longitudinal rims or flanges *b'*, formed on the inner surface of the casing, by means of wedges, such wedges being hammered into position, so as to effect a tight joint after the requisite number of blocks have been placed on the curve of the casing. After the blocks have been thus placed into position, plaster-

40 of-paris or other suitable cement may be inserted between the joints of the same, so that a thoroughly firm and substantial emery lin-

ing may be provided for the casing. This method of holding in position the blocks which form a lining of the casing is very simple and is at the same time very effective.

At the discharge end of the machine the casing is formed with a head *b³*. At the feed or head end of the machine, however, no end or head to the casing is provided, but the escape of seed is prevented by the revoluble disk J, whose periphery is beveled or inclined inward toward the center of the machine, and is provided with a dovetail holding-section to secure in place the abrading-blocks *j*.

70 The high end of this disk comes in close contact in its revolution with the annular rim *a*, which is secured to the end of the casing at this end of the machine. The distance between the rim and the disk is sufficient to provide for any expansion of the parts due to the heating which is naturally caused by the operation of the machine, but is still very slight. In actual operation, I have found that no loss of seed occurs at this point, while

75 undue heating of the machine at the head end of the machine is obviated.

II. *Feeding and conveying devices*.—Seed is conveyed into the machine through the feed stand-pipe E, which is located at the

80 feed or head end of the machine, and is in direct communication with the interior of the casing through an opening formed therein. The opening in the casing is directly over the place at which the revoluble disk J is mounted upon the central shaft, and thus said disk is enabled to assist in the feed of the seed to the machine in a manner which will now be described.

The feed stand-pipe is telescopic, and consists of a stationary outer section E', which is secured firmly in place on the outer surface of the casing, and of an inner moving section E². The moving section E² is adapted to project into the casing and contact with the periphery of the disk J. Its lower end is beveled or inclined, as shown at *e²*, to correspond with the inclination of the disk J, so that a close contact may be effected between said moving section of the telescopic stand-pipe and the periphery of the disk.

85 To prevent crowding of the seed in the stand-pipe, and the friction and heating of the seed which would naturally result therefrom, the end of the moving section E² toward the direction of rotation of the disk J is cut away, as shown at *e³*. No undue escape of seed takes place on account of this formation, however, as the direction of the rotation of the disk J is such as to feed seed into the machine from the other side of the moving section of the stand-pipe, which is not cut away.

To prevent clogging of seed in the stand-pipe, the stationary section E' thereof is provided with an inner lining *e*, and the space between the lining and the inner surface of the section E' is made sufficient to permit the moving section E² to slide between the same. In this manner the inner surface of the stand-

pipe is made perfectly smooth, and no obstacle is offered to which the seed can cling in its downward passage to the machine.

The feed or supply of seed to the machine is effected by the action of the revolving disk J, which acts to draw seed from the stand-pipe and feed it forward through the machine in proportion to the distance between its periphery and the lower edge of the moving section of the stand-pipe. When said moving section contacts with the periphery of the disk, the supply of seed is entirely interrupted; and the amount of seed carried to the abrading-surfaces can be controlled and regulated by controlling the position of the moving section of the stand-pipe.

The position of the moving section E² is determined by the double lever E³, which is pivoted to the stand-pipe on one side of the same, and acts in connection with the curved rack-bar E⁴. Slots e⁴ are formed in the double lever, into which project the lugs e⁵, which are formed on the sides of the moving section E², the vertical slots e⁶ permitting the necessary play.

I have found it unnecessary to make use of any other method than that described to effect the conveying of seed through the machine. The constant forward impulse caused by the action of the beveled surface of the revoluble disk J is sufficient to cause the desired passage of the seed through the machine.

III. *The seed-discharge stand-pipe.*—The discharge of the cleansed seed from the machine is effected through the stand-pipe F, which is secured to the head or end of the casing at the discharge end of the machine. The stand-pipe consists of the upright pipe F', at the lower end of which a funnel-shaped outlet F² is formed. The discharge through the outlet-opening F² is regulated by the valve F³, whose position is controlled by the lever f³, working upon the rack-bar f⁴. The stand-pipe is stationed on the head of the casing near the periphery of the same and is placed in communication with the interior of the casing, in which the abrading action is taking place, by means of an opening in the head of the casing, which extends to the periphery thereof and is partially closed by a sliding valve F⁴.

Bearing in mind the fact that seed under treatment in a cotton-seed delinter lies in the form of a roll around the inner surface of the casing, it will be seen that when the sliding valve F⁴ is drawn upward by the valve-controlling rod F⁵ the seed forming the roll at that end of the machine will gradually work into the discharge stand-pipe and bank up into the same, the discharge from the stand-pipe being regulated by the position of the valve F³. When the seed, banked up in the stand-pipe, has reached the height of the upper surface of the valve F⁴, it will fall back into the casing and be again subjected to the delinting operation. The passage of seed into and out of the stand-pipe will be continuous,

and can be observed through a window F⁶, which I form on the outer face of the stand-pipe, so that in this machine I am able to inform myself at all times of the condition of the seed under treatment.

All of the regulating qualities of the original form of stand-pipe described in my application for Letters Patent filed May 4, 1895, Serial No. 548,146, are herein preserved, and, in addition, a more thorough scouring action is provided for such seed as rises up in the stand-pipe, and an opportunity is afforded for accurately knowing the condition of seed under treatment in the machine. At the beginning of the operation of the machine the sliding valve F⁴ may be so placed as to close the lower portion of the opening in the casing, and thus compel the seed to be thoroughly cleaned before such valve is drawn up and the normal operation of the machine begins.

It is a matter of essential importance in a cotton-seed delinter to provide means for effectively and rapidly removing the lint, which is scoured from the seed by the action of the abrading-surfaces. If the lint were allowed to gather in the machine, it would interrupt the delinting operation by dulling the abrading-surfaces, and would itself be cut to pieces and its value impaired by the contact which it would have with the abrading-surfaces. The removal of lint from a delinter must, however, be effected by positive means, as the lint, being of less specific gravity than the seed, lies on the inner surface of the roll which the seed forms in the machine.

In my present construction I have made use of the fact that in the arm type of cotton-seed delinters the seed is not subjected to as active abrading action at the upper surface of the casing as at the lower surface, on account of the influence of gravity upon the roll of seed under treatment. On the upper surface of the casing, a little to one side of the center of the same, I form perforations G, and support in communication with the perforated portion of the casing the open end of the air-flume H, in which an exhaust-air current is generated by the exhaust-fan I. The seed under treatment is at this portion of the casing most readily subject to the influence of the air-current when the direction of rotation of the abrading-surface is that indicated by the arrow in the drawings. The lint can therefore be most readily removed by the action of the exhaust-air current. The perforations in the casing are made in the shape shown in the drawings, oblong, in the direction of the circle of the casing, in order to facilitate the lint removal.

The dirt separated from the machine in the course of the delinting operation escapes from the machine through the perforations K, which are formed in the bottom of the casing.

It is essential to provide means for keeping the portion of the casing through which the lint is removed clean and free from adhering

lint, and advantageous to prevent clogging of the dirt in the perforations through which it escapes from the machine. I accomplish these objects by supporting on the central shaft C, at both ends of the machine, two-armed castings L. In the upper arm L¹ of the castings are formed journals for the revoluble brush M, which is operated, as shown in Fig. 1, by a belt connection with the central shaft. To the lower arm L² of the two-armed castings L, I secure the brush N, which contacts with the perforated portion of the casing through which the dirt escapes.

A reciprocatory movement is given to the castings L, in order to cause the respective brushes to travel across the perforated portions of the periphery of the casings with which they contact, by the action of the cranks O, secured to the lower arms of said castings L and to the gear-wheels P. The gear-wheels P are themselves in gear with the gear-wheels Q, which are operated by a belt connection with the power-shaft. In this manner any desired speed of reciprocation of the brushes across the perforated periphery of the casing can be obtained.

IV. *The operation of the machine.*—In the operation of my machine seed is fed into the machine through the feed-pipe E in quantities regulated by the position of the moving section E² of the same, and is conveyed through the machine by virtue of the forward impulse given to the seed by the beveled-faced revoluble disk J, which acts in connection with the feed stand-pipe and is stationed directly under the same. The removal of the lint from the seed under treatment is effected by the abrading action of the revoluble arms D and the emery-lined inner surface of the casing. The seed is discharged from the machine through the discharge stand-pipe F, the seed which banks up in said stand-pipe returning to the interior of the casing as the height of said seed reaches the upper level of the sliding valve F⁴. The lint which is scoured from the seed by the action of the machine is removed from the inclosure in which the abrading action is taking place by the exhaust-air current, caused by the action of the exhaust-fan I, stationed in the air-flume H, the revoluble brush M keeping the perforations through which the lint is removed clean and free from adhering lint. The dirt which is separated from the seed in the course of the delinting operations escapes through the perforations K at the bottom of the machine, such perforations being kept clean by the reciprocations of the brush N.

I do not herein broadly claim the use of a discharge stand-pipe to control the escape of the cleansed seed, as that is claimed in a prior application for Letters Patent filed by me May 4, 1895, Serial No. 548,146; but

What I do claim as new, and desire to secure by Letters Patent, is—

1. In a cotton-seed delinter, the combina-

tion with a casing having a feed-opening therein, and a shaft extending through the same, of a revoluble body mounted on said shaft beneath said opening, a telescopic feed-pipe stationed over said opening, the moving section thereof being adapted to project into the casing and contact with said revoluble body, and means for controlling the position of said moving section, substantially as described.

2. In a cotton-seed delinter, the combination with a casing having a feed-opening therein, and a shaft extending through the same, of a revoluble body mounted on said shaft beneath said opening, a telescopic feed-pipe stationed over said opening, the stationary section thereof being provided with a lining separate from the body of the same, and the moving section sliding between the lining and the body of said stationary section, and being adapted to project into the casing and contact with said revoluble body, and means for controlling the position of said moving section, substantially as described.

3. In a cotton-seed delinter, the combination with a casing having a feed-opening therein, and a shaft extending through the same, of an inwardly-sloping beveled-faced disk mounted on said shaft beneath said opening, a telescopic feed-pipe stationed over said opening, the moving section thereof being adapted to project into the casing and contact with the periphery of said disk, and having a lower end inclined to correspond with the slope of said disk, and means for controlling the position of said moving section, substantially as described.

4. In a cotton-seed delinter, the combination with a casing having a feed-opening therein, and a shaft extending through the same, of a revoluble body mounted on said shaft beneath said opening, a telescopic feed-pipe stationed over said opening, the moving section thereof being adapted to project into the casing and contact with said revoluble body, and having its lower end cut away at the front thereof, and means for controlling the position of said moving section, substantially as described.

5. In a cotton-seed delinter, the combination with a casing having a feed-opening therein, and a shaft extending through the same, of a revoluble body mounted on said shaft beneath said opening, a telescopic feed-pipe stationed over said opening, the stationary section thereof having slots cut in its sides, and the moving section thereof having lugs formed on its sides adapted to project through said slots, the pivoted controlling-lever E³, and the rack E⁴, whereby the position of said moving section is controlled, substantially as described.

6. In a cotton-seed delinter, the combination with a casing having a feed-opening therein, and a shaft extending through the same, of a feed-pipe stationed over said open-

ing, and an inwardly-sloping, beveled-faced disk mounted on said shaft beneath said opening, substantially as described.

7. In a cotton-seed delinter, the combination with a casing, and a shaft extending through the same, of a series of arms, having curved outer ends, mounted on said shaft, said ends being broadened and bent on each side away from the casing so as to form outwardly-flared A-shaped abrading portions, the hollowed surfaces of which face inwardly, substantially as described.

8. In a cotton-seed delinter, the combination with a revolving abrading-surface, a casing therefor having an opening in one end extending to the periphery thereof, and a valve partially closing said opening, said valve being smaller than said opening, leaving thereby a space above and below the same, of an upright pipe in communication with said opening, substantially as described.

9. In a cotton-seed delinter, the combination with a revolving abrading-surface, a casing therefor having an opening in one end extending to the periphery thereof, and a valve partially closing said opening, said valve being smaller than said opening, leaving thereby a space above and below the same, of an upright pipe in communication with said opening, and a valved outlet at the bottom thereof, substantially as described.

10. In a cotton-seed delinter, the combination with a revolving abrading-surface, a casing therefor having an opening in one end extending to the periphery, and an adjustable valve partially closing said opening, said valve being smaller than said opening, leaving thereby a space above and below the same, of an upright pipe in communication with said opening, and a valved outlet at the bottom thereof, substantially as described.

11. In a cotton-seed delinter, the combination with a casing having a portion of its surface perforated, a shaft extending through the same, and a revolving abrading-surface mounted thereon, of an air-flume in communication with the perforated portion of said casing, means for causing an exhaust-air current therein, arms mounted upon said central shaft, a brush supported by said arms adapted to rest upon the perforated portion of said casing, means for revolving said brush, and means for reciprocating said brush across said perforated portion, substantially as described.

12. In a cotton-seed delinter, the combination with a casing having a portion of its surface perforated to permit of lint removal, and a portion of its surface perforated to permit of dirt removal, a shaft extending through the same, and a revolving abrading-surface mounted on said shaft, of an air-flume in communication with the lint-removal perforated portion of said casing, means for causing an exhaust-air current therein, castings mounted on said shaft having two arms, a revoluble brush adapted to rest upon the lint-removal perforated portion of said casing supported by the upper set of said arms, means for revolving the same, a stationary brush adapted to rest upon the dirt-removal perforated portion of said casing supported by the lower set of said arms, and means for reciprocating said casting so as to cause said brushes to sweep across their respective perforated sections, substantially as described.

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

JAMES J. FAULKNER.

Witnesses:

HUGH B. CULLEN,
J. F. HUDSPETH.