

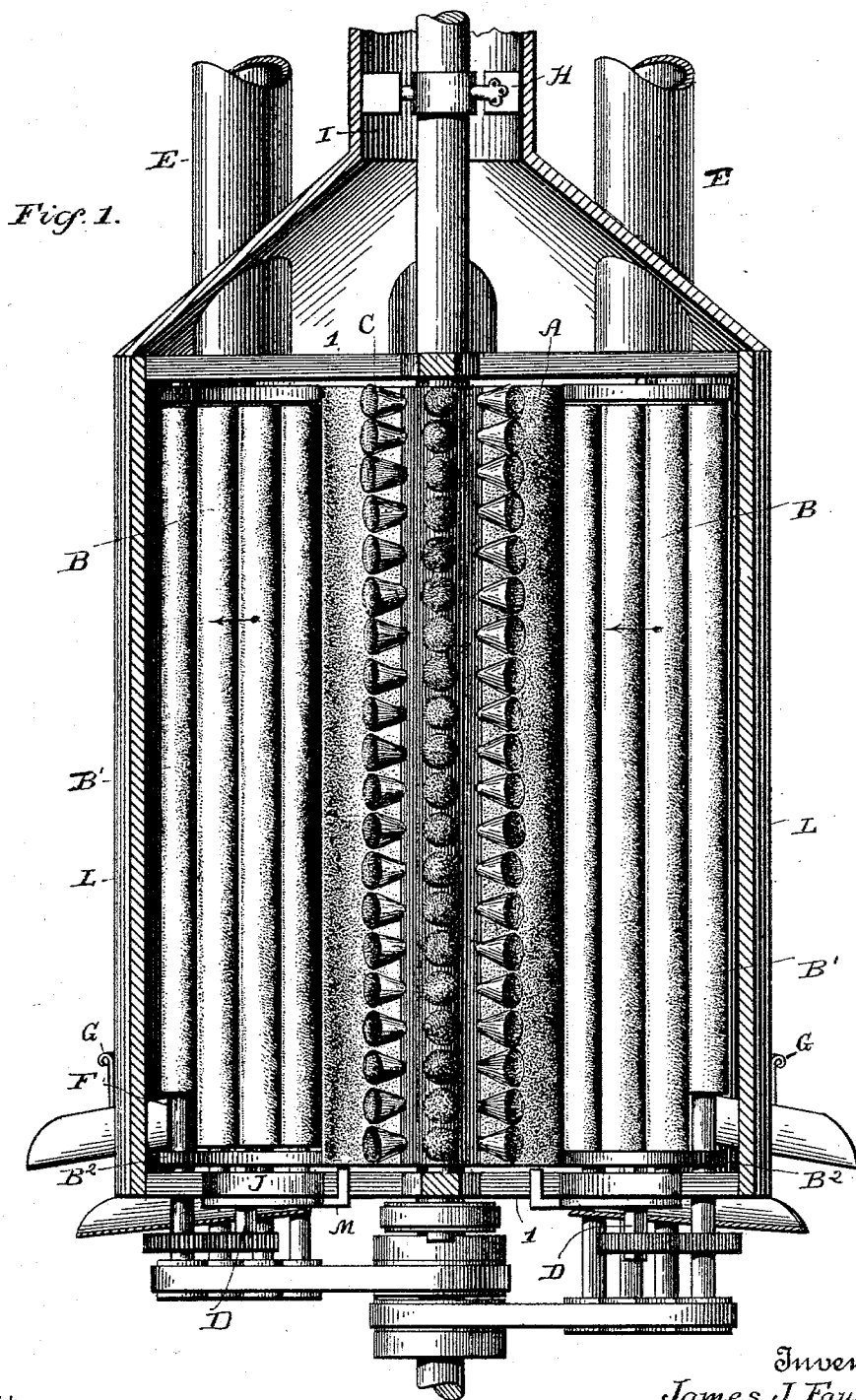
(No Model.)

4 Sheets—Sheet 1.

J. J. FAULKNER.
COTTON SEED DELINTER.

No. 546,273.

Patented Sept. 10, 1895.



Witnesses
Victor J. Evans.
Marie Wilson

Inventor
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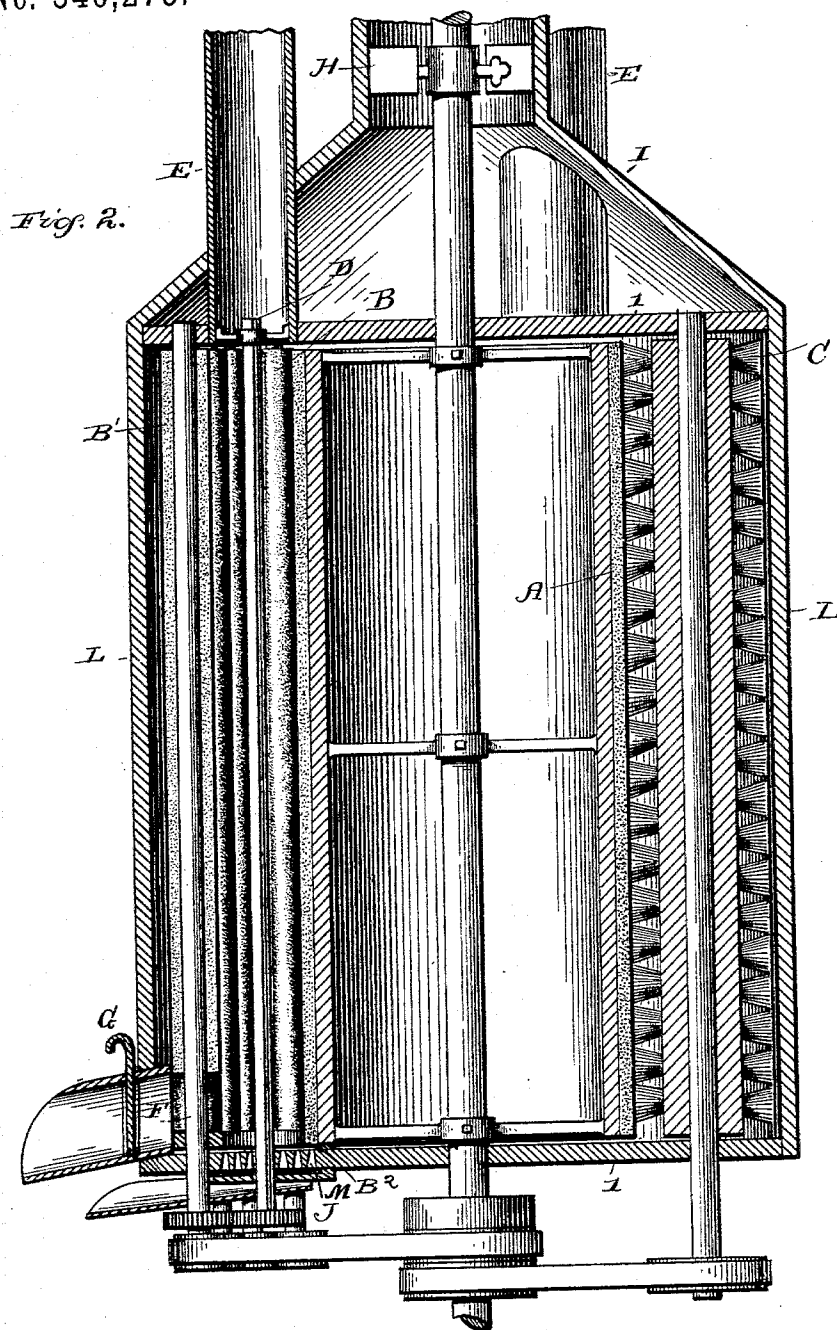
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4 Sheets—Sheet 2.

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(No Model.)

4 Sheets—Sheet 3.

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Fig. 3.

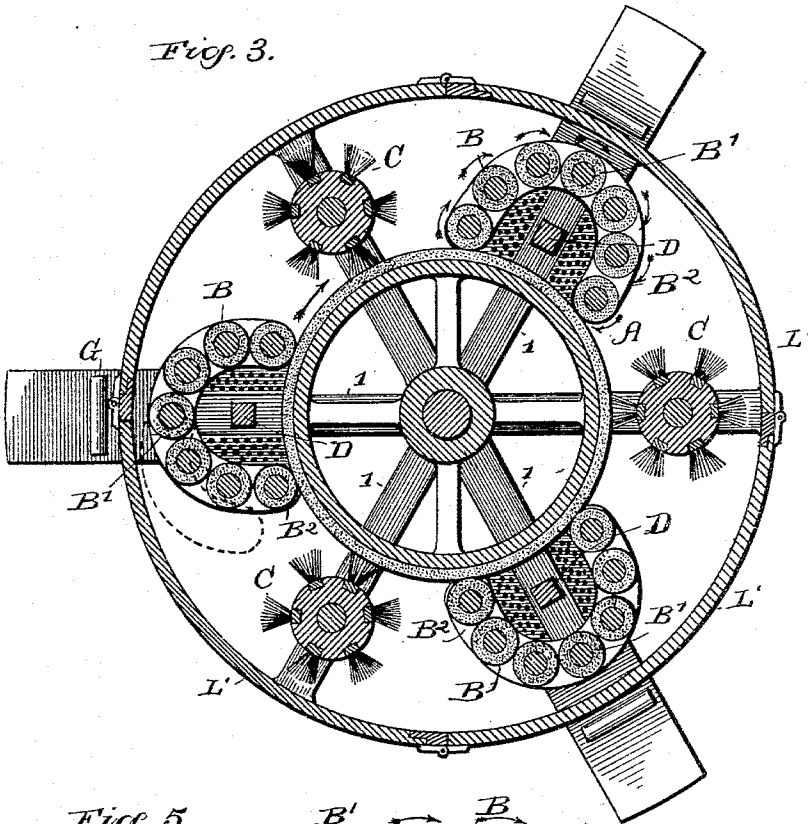
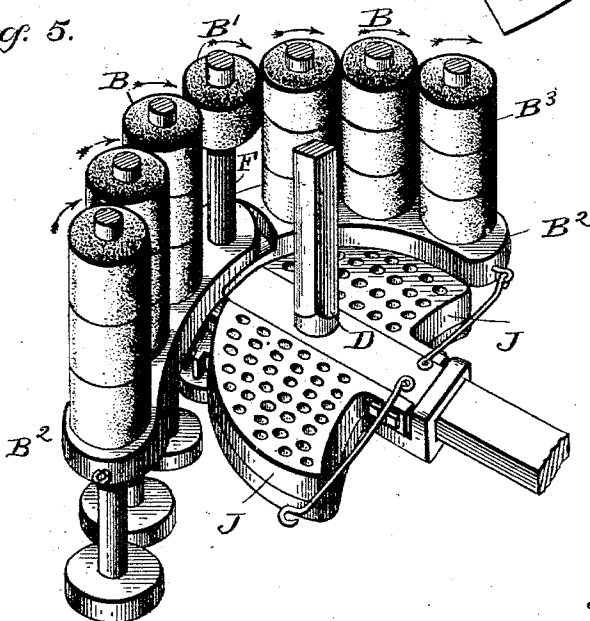


Fig. 5.



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Fig. 4.

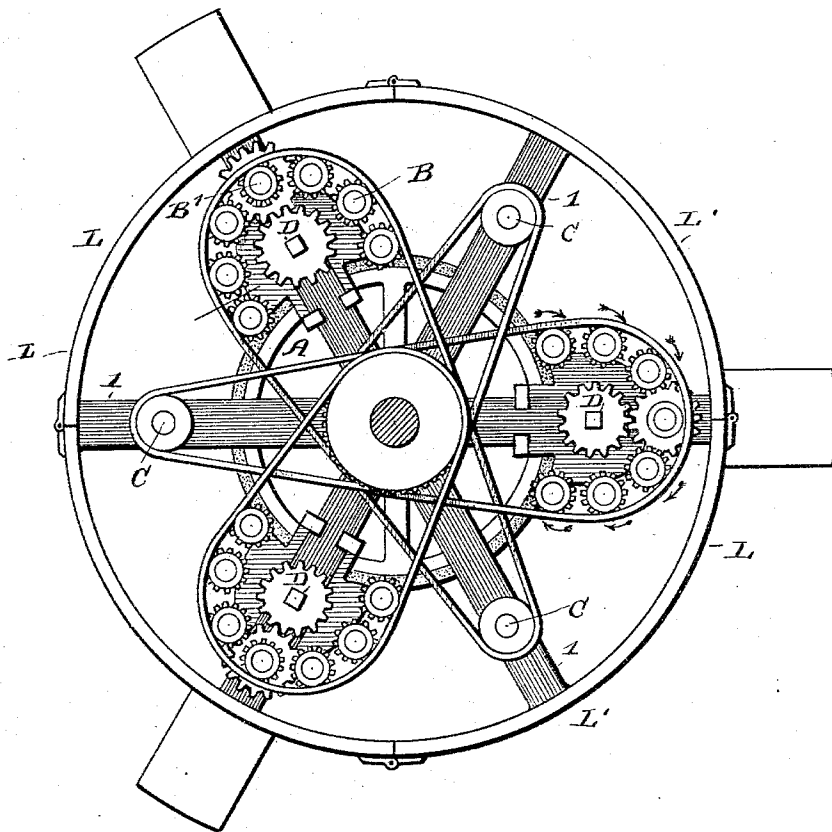
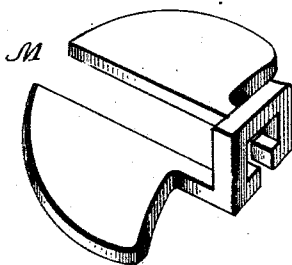


Fig. 6.



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UNITED STATES PATENT OFFICE.

JAMES J. FAULKNER, OF MEMPHIS, TENNESSEE, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE STANDARD COTTON SEED COMPANY, OF ARKANSAS.

COTTON-SEED DELINTER.

SPECIFICATION forming part of Letters Patent No. 546,273, dated September 10, 1895.

Application filed June 13, 1895. Serial No. 552,686. (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 for 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.

One of the great difficulties with the practical use of the present style of delinters lies in the number of operative parts which are necessary to make up a complete and successful machine. While several constructions have been devised which are comparatively inexpensive in all of them there must be at least the following elements of construction: first, abrading-surfaces between which the delinting action can take place; second, means for removing the lint separated by the action of the machine from the seed under treatment; third, a seed-inlet opening; fourth, a seed-discharge opening, and, fifth, means for removing the dirt which is separated from the seed during the course of the delinting operation.

By far the greater part of the cotton-seed delinters which have heretofore been constructed have been made with a view to effecting the removal of the lint from the seed by a scouring action between two closely-spaced abrading-surfaces. A great number of these machines have effected the scouring action between the periphery of a cylinder covered with an abrading substance and a circumferential casing, the lint being removed either through an aperture formed in the side of the casing or through perforations formed in the casing itself. This construction has been varied by the substitution of revolving paddles for the delinting-cylinder, said paddles operating sometimes in connection with

casings, on the inner face of which projecting pins are placed, and sometimes in connection with disks composed of emery or other abrading substance. In all of these constructions, however, the same fundamental principle of action has been utilized—namely, that of obtaining a cleaning or scouring of the seed under treatment by imparting to the seed a centrifugal motion and then scouring or delinting it by making it move between two closely-spaced abrading-surfaces. While this construction has resulted in the production of several machines which are successfully operative and have considerable capacity in handling seed it is still unsatisfactory in that it requires so many elements of construction, any one of which by getting out of order can interrupt the operation of the entire machine.

In all of the constructions now in use the seed is subject to the danger of being broken or injured by the delinting action. A very slight injury to the seed, such as that of cracking the hull of the same, almost destroys the commercial value of the seed, and this is to be avoided, if possible.

The machines which have been heretofore constructed have moreover been formed so that if through any mishap a large nail or spike should be fed into the machine such foreign substance will break the abrading-surfaces and compel a complete overhauling of the machine. The greatest objection, however, which is inherent in the present construction is that it affords no possibility of greatly increasing the capacity of the machine. The capacity is limited by the amount of abrading-surface which can be utilized, and this being dependent upon the circumference of the space surrounding the delinting-cylinder is limited by the diameter of the cylinder which is used. Structural reasons dictate a reasonable limit in the size of delinting-cylinders, so that the possibility of greatly increasing the capacity of a cotton-seed delinter does not exist while the present constructions are followed.

The object of my present invention is to provide a cotton-seed delinter which shall be more simple in construction than those hitherto devised, which shall operate in such a manner as to render any breakage or injury

to the seed under treatment impossible, which shall provide a more complete and satisfactory means for removing the lint which is separated by the action of the machine from the seed, and which shall permit the possibility of largely increasing the capacity of a single machine by a simple duplication of abrading-surfaces.

In accomplishing the object of my invention I have journaled a series of positively-actuated abrading-rolls so close together that their surfaces are in such close proximity that seed will not pass between the same, and arrange them in an arc of a circle, so that, in connection with an abrading-cylinder which covers the space left between the end rolls, which cylinder moves in the same direction of rotation as the rolls, they completely inclose the space into which the seed to be treated may be fed. Seed fed into the space thus formed is constantly subjected to an abrading or scouring action, as it meets with none but abrading-surfaces. It is rapidly delinted. Injury to the seed is impossible, because when the rolls inclosing the space are rotated in the same direction contiguous faces of the same move in opposite directions, so that there is no chance for seed to escape. Removal of lint is, however, effected by the abrading-rolls themselves as they complete their revolution, and the lint is discharged outside of the pocket formed by the rolls. For the purpose of keeping the abrading-surfaces of the rolls perfectly clean I preferably provide an air-current, which sweeps over the exterior surface of such rolls and removes therefrom all of the lint which they have taken from the seed.

The construction described is by itself operative, but its capacity can be largely increased by providing a central agitator in the pocket formed by the rolls, which will throw the seed against the surfaces of the abrading-rolls. I therefore preferably use such an agitator. To prevent the surface of the abrading-cylinder being covered with lint, I further make use of doffing-brushes, which operate upon the surface of the cylinder and sweep off of the same such lint as adheres thereto, an air-current removing the lint into an exhaust lint-discharge flume.

This machine may be placed either horizontally or vertically, but in my preferred construction I make use of a vertical machine, as thereby the feed of the seed into the machine, its passage through the machine, and the discharge thereof is much simplified. The feeding of the seed into the machine can be effected through a stand-pipe arranged so as to discharge its contents into the top of the pocket formed by the rolls. The discharge of the seed can be effected by making one of the abrading-rolls a little shorter than the others, while extending the spindle on which the roll is mounted to its lower bearing. Through the space thus formed the seed will be discharged, the discharge being limited and controlled by

a gate or valve, which closes to any desired extent such opening. Removal of the coarse dirt, which is usually present with cotton-seed while it is being delinted—for instance, leaves or cotton-bolls—is effected by using a perforated plate as the bottom of the inclosed space formed by the rolls, through the perforations in which plate the coarse dirt as it is ground up by the action of the machine may pass.

As any number of pockets or rolls may be used around a single central abrading-cylinder, it will be seen that the capacity of a machine constructed in accordance with my present design is capable of variation within wide limits. When several pockets are used in connection with a single abrading-cylinder, it is, however, advisable to provide means for throwing any one of such pockets out of action should one of the abrading-rolls forming the same become damaged, in order that shutting down of the entire machine will not be necessary. I accomplish this object by pivoting the rolls to each other in such a manner as to enable them to be swung out and away from the abrading-cylinder. Damage done to any one series of rolls can thus be repaired without interrupting the operation of the remaining rolls.

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

Figure 1 is a view of the entire machine, a portion of the casing being broken away so as to show the arrangement of the various parts. Fig. 2 is a central vertical section of the machine. Fig. 3 is a horizontal cross-section thereof, showing the position and arrangement of the various compartments formed by the different series of rolls to the central delinting-cylinder, and also showing the relative positions which the doffing-brushes occupy. Fig. 4 is a bottom plan view of the machine, showing the operative mechanism. Fig. 5 is a detail view of the lower portion of the rolls constituting one of the pockets, showing the seed-outlet, and also illustrating the manner in which the rolls can be thrown out of engagement with the central delinting-cylinder. The central delinting-cylinder is not shown in this drawing. Fig. 6 is a view of the cover used on the lower surface of the perforated plate shown in Fig. 5, which forms the bottom of each abrading-pocket.

Referring to the drawings, 1 represents the machine-frame. In this frame are journaled in suitable bearings the central abrading-cylinder A; the series of rolls B, which form the abrading-pockets of the machine; the doffing-brushes C, which act to free the surface of the delinting-cylinder from lint, and the agitators D, arranged centrally within the pockets formed by the abrading-rolls. All of the abrading-rolls have the same direction of rotation, being operated by any suitable con-

nection to a power element, such as the belt connection shown in the drawings, with the shaft on which the abrading-cylinder is mounted. The cylinder itself rotates in the same direction as the rolls, so that there is presented in this machine a number of abrading-surfaces, all rotating in the same direction. The feeding of seed to the machine takes place through stand-pipes E, one of which is arranged vertically over each pocket of abrading-rolls, the feed to each of said pockets being separate and distinct from that to the others. The rolls are placed so close together that seed will not pass between the same, and they are further arranged in the arc of a circle, so that with the aid of the abrading-cylinder, which closes the space between the end rolls, they completely surround the space into which the seed is fed.

The abrading action takes place by the seed coming in contact with the abrading-surface of the rolls. This it would do without the use of the agitator D, on account of the irregular shape of the pocket formed by the rolls. The agitator, however, by its rapid revolution increases the abrading action by throwing the seed rapidly against the abrading-surfaces, so that the seed becomes in time thoroughly scoured, and its surface is finally entirely freed from lint. The discharge of the seed is effected through a space formed by making one of the rolls shorter than the rest and extending the bare spindle F to the lower bearing. In order to check excessive discharge of the seed through such opening and to regulate the discharge in accordance with the condition of the seed under treatment, I make use of a curved valve G, which is stationed in the discharge-spout and can be adjusted vertically, so as to close said opening to any desired extent.

While the lint is thus removed from all portions of the seed under treatment, and while injury to the seed is impossible because contiguous faces of the abrading-rolls move in opposite directions and thus will not permit the seed being ground between the same, the machine would not be successfully operative if means were not provided for constantly removing the lint separated from the seed by the action of the machine. The lint removal is effected by the lint clinging to the abrading-surface of the rolls themselves and being drawn out with such rolls as they complete their revolution, it then being swept off the surface of such rolls by an upward air-current, caused by the exhaust-fan H, which is stationed in the air-flume I at the top of the machine. The lint-removing surface in this machine is thus as great as the abrading-surface itself, so that instantaneous removal of the lint separated by the action of the machine is effected, and the efficiency of the machine is much increased over the present constructions.

Should spikes or nails be accidentally fed into this machine, no injury can take place

to the abrading-surface, as the spikes cannot be drawn outward between the abrading-rolls. Coarse dirt, such as leaves or bolls, which cannot be easily separated from the seed before it is fed to the abrading-surface, is removed from the machine through the perforated plate J, which closes the bottom of the space formed by the abrading-rolls, and is provided with a cover M to govern the number of openings exposed at any one time. The upper surface of the perforated plate is preferably made of emery, that being the abrading material which I use in this machine. The perforations in the plate increase in diameter as they approach the bottom of the same, so that any particles of dirt which enter the perforations in the plate will escape readily from the perforations without clogging or obstructing the same.

In the construction shown in the drawings three pockets formed of abrading-rolls are represented around the surface of the abrading-cylinder and three doffing-brushes shown to clean the surface of the abrading-cylinder, the lint being drawn upward into the flume I in connection with the lint removed from the surfaces of the abrading-rolls. It is apparent, however, that any number of abrading-pockets may be used around the periphery of the abrading-cylinder by simply increasing the diameter of such cylinder, so that it will present a periphery of sufficient extent to enable the proper spacing of the desired number of pockets. When several pockets are used around the surface of one cylinder, it becomes, however, a matter of essential importance that means be provided for removing any one set of rolls from its close proximity to the abrading-surface of the central cylinder, so that the machine will not have to be shut down should any one of the rolls in any one of the pockets become injured. This I effect in the construction shown by pivoting the central roll B' of each pocket in fixed bearings in the machine-frame and pivoting to the same with a swinging connection the remaining rolls forming the pocket, locking-plates B² being used to hold the rolls in any desired position. It is a very easy matter to swing the rolls forming any one pocket out of connection with the abrading-surface of the central cylinder, and repair of the surface of any of the rolls forming a pocket can thus be quickly effected without rendering necessary the stoppage of the entire machine.

The abrading-rolls themselves are preferably, though not necessarily, made with a smooth emery surface, as shown in the drawings. They may be made in a single mold, or may be made of a number of short sections B³, each of which is glued or otherwise secured to the central spindle. This construction is shown in Fig. 5 of the drawings.

The size of the space inclosed by each series of rolls may be varied within quite wide limits; but I prefer not to make such space

greater than a width of six to eight inches at any point.

In order to permit ready access to any of the working parts, I provide the exterior casing L with a number of doors L', any one of which may be opened when desired to secure access to the interior of the machine.

The operation of my machine is as follows: Seed is fed into the pockets formed by the abrading-rolls through the feed stand-pipes E. As soon as such pockets become filled with seed, the scouring or abrading action commences, and lint and fine dirt are removed from the seed by the revolving surfaces of the rolls, which form the pockets, such lint being swept upward into the air-flume I by the air-current caused by the exhaust-fan H. The seed itself is prevented from mutilation by the impossibility of its being carried out by the abrading-rolls, and as it becomes entirely separated from the lint is discharged through the space surrounding the spindle F. The discharge is regulated by the valve G and is controlled so that only perfectly-delinted seed is discharged. If desired, the valve G may be entirely closed and the discharge of the seed take place through the perforated plate J. Removal of coarse dirt from the machine is effected through the perforations in the bottom plate J. Should any of the rolls forming any one of the abrading-pockets become injured, the rolls of this pocket are quickly swung back from contact with the central delinting-cylinder and repair is at once effected. The rolls can now be swung back again into operative position and locked in position.

The capacity of the machine which I have thus described is only limited by the number of pockets which it may be found in practice advisable to use around the central delinting-cylinder. Each one of the pockets I have found to have a capacity equal to that of any one of the machines which are now in operation.

I do not herein claim the use of a stand-pipe as the means for feeding the seed to the abrading-pockets, as that is claimed in a companion application filed by me May 4, 1894, Serial No. 548,146.

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

1. In a cotton seed delinter, the combination with a series of positively-actuated rotating surfaces, placed with their meeting faces in such close proximity that seed will not pass between the same, and arranged to form a complete inclosure for the body of seed under treatment, and means for causing said surfaces to rotate in the same direction, of seed inlet and discharge openings, and means for removing the lint separated by the action of the machine, substantially as described.

2. In a cotton seed delinter, the combination with a series of positively-actuated rotating surfaces placed with their meeting faces

in such close proximity that seed will not pass between the same, and arranged to form a complete inclosure for the body of seed under treatment, and means for causing said surfaces to rotate in the same direction, of seed inlet and discharge openings, and means for causing an air current to sweep over the outer faces of the surfaces, substantially as described.

3. In a cotton seed delinter, the combination with a series of positively-actuated rolls, placed with their meeting faces in such close proximity that seed will not pass between the same, and arranged to form a complete inclosure for the seed under treatment, and means for causing said rolls to rotate in the same direction, of seed inlet and discharge openings, and means for removing the lint separated by the action of the machine, substantially as described.

4. In a cotton seed delinter, the combination with a series of positively-actuated rolls, placed with their meeting faces in such close proximity that seed will not pass between the same, and arranged to form an irregularly shaped complete inclosure for the seed under treatment, and means for causing said rolls to rotate in the same direction, of seed inlet and discharge openings, and means for removing the lint separated by the action of the machine, substantially as described.

5. In a cotton seed delinter, the combination with a series of positively-actuated rolls, placed with their meeting faces in such close proximity that seed will not pass between the same, and arranged to form a complete inclosure for the seed under treatment, and means for causing said rolls to rotate in the same direction, of seed inlet and discharge openings, means for forcing the seed under treatment in close contact with the abrading surfaces, and means for removing the lint separated by the action of the machine, substantially as described.

6. In a cotton seed delinter, the combination with a series of positively-actuated rolls, placed with their meeting faces in such close proximity that seed will not pass between the same, and arranged to form a complete inclosure for the seed under treatment, and means for causing said rolls to rotate in the same direction, of seed inlet and discharge openings, an agitator operating within the inclosure, and means for removing the lint separated by the action of the machine, substantially as described.

7. In a cotton seed delinter, the combination with a series of positively-actuated rolls, arranged in an arc of a circle, and placed with their meeting faces in such close proximity that seed will not pass between the same, an abrading cylinder mounted so as to prevent discharge of seed through the opening formed by the end rolls, and means for causing said rolls and said cylinder to rotate in the same direction, of seed inlet and discharge open-

ings, and means for removing the lint separated by the action of the machine, substantially as described.

8. In a cotton seed delinter, the combination with a series of positively actuated rolls, arranged in an arc of a circle, and placed with their meeting faces in such close proximity that seed will not pass between the same, an abrading cylinder mounted so as to prevent discharge of seed through the opening formed by the end rolls, and means for causing said rolls and said cylinder to rotate in the same direction, of seed inlet and discharge openings, means for removing the lint separated by the action of the machine, and means for forcing the seed into intimate contact with the abrading surfaces, substantially as described.

9. In a cotton seed delinter, the combination with a series of positively actuated rolls, arranged in an arc of a circle, and placed with their meeting faces in such close proximity that seed will not pass between the same, an abrading cylinder mounted so as to prevent discharge of seed through the opening formed by the end rolls, and means for causing said rolls and said cylinder to rotate in the same direction, of seed inlet and discharge openings, means for removing the lint separated by the action of the machine, and an agitator stationed within the inclosure formed by the rolls and cylinder, substantially as described.

10. In a cotton seed delinter, the combination with a series of positively-actuated, vertically arranged abrading rolls, arranged in an arc of a circle, and placed with their meeting faces in such close proximity that seed will not pass between the same, an abrading cylinder mounted so as to prevent discharge of seed through the opening formed by the end rolls, and means for causing said rolls and said cylinder to rotate in the same direction, of seed inlet and discharge openings, means for removing the lint separated by the action of the machine, and an agitator stationed within the inclosure formed by the rolls and cylinder, substantially as described.

11. In a cotton seed delinter, the combination with a series of positively-actuated, vertically-arranged abrading rolls, placed with their surfaces in such close proximity that seed will not pass between the same, and arranged to form a complete inclosure, and means for causing said rolls to rotate in the same direction, of seed inlet and discharge openings, means for removing the lint separated by the action of the machine, and a perforated plate forming the bottom of said inclosure, the perforations thereof being too small to permit the passage of seed there-through, substantially as described.

12. In a cotton seed delinter, the combination with a series of positively-actuated rotating abrading rolls, placed with their surfaces in such close proximity that seed will not pass between the same, and arranged in the form of an inclosure, the diameter of a portion of one of said rolls being reduced, of means for caus-

ing said rolls to rotate in the same direction, substantially as described.

13. In a cotton seed delinter, the combination with a series of positively-actuated rotating abrading rolls, placed with their surfaces in such close proximity that seed will not pass between the same, and arranged in the form of an inclosure, the diameter of a portion of one of said rolls being reduced, of a seed inlet opening, means for governing the discharge around the reduced portion of said roll, and means for removing the lint separated by the action of the machine, substantially as described.

14. In a cotton seed delinter, the combination with a series of positively-actuated, rotating abrading rolls, placed with their surfaces in such close proximity that seed will not pass between the same, and arranged in the form of an inclosure, the diameter of a portion of one of said rolls being reduced, of a seed inlet opening, a valve for controlling the discharge around the reduced portion of said roll, and means for removing the lint separated by the action of the machine, substantially as described.

15. In a cotton seed delinter, the combination with a series of positively-actuated rolls, arranged in an arc of a circle and placed with their meeting faces in such close proximity that seed will not pass between the same, an abrading cylinder mounted so as to prevent discharge of seed through the opening formed by the end rolls, and means for causing said rolls and said cylinder to rotate in the same direction, of seed inlet and discharge openings, and means for causing an air current to sweep over the outer faces of the moving surfaces, substantially as described.

16. In a cotton seed delinter, the combination with a series of positively-actuated rolls, arranged in an arc of a circle, and placed with their meeting faces in such close proximity that seed will not pass between the same, an abrading cylinder mounted so as to prevent discharge of seed through the opening formed by the end rolls, and means for causing said rolls and said cylinder to rotate in the same direction, of seed inlet and discharge openings, means for causing an air current to sweep over the outer faces of the moving surfaces, and a doffing brush acting upon the periphery of the abrading cylinder, substantially as described.

17. In a cotton seed delinter, the combination with a series of positively-actuated rolls, arranged in an arc of a circle, and placed with their meeting faces in such close proximity that seed will not pass between the same, an abrading cylinder mounted so as to prevent discharge of seed through the opening formed by the end rolls, and means for causing said rolls and said cylinder to rotate in the same direction, of seed inlet and discharge openings, means for removing the lint separated by the action of the machine, and means for permitting the rolls to be released from their

engagement with the cylinder, substantially as described.

18. In a cotton seed delinter, the combination with a series of positively-actuated abrading rolls, placed with their surfaces in such close proximity as to prevent passage of seed therethrough, and arranged in the arc of a circle, one of said rolls being mounted in fixed bearings, and the remainder of said rolls being pivotally connected thereto, means for locking said rolls in position, an abrading cylinder mounted so as to prevent the discharge of seed through the opening formed by the

end rolls, and means for causing said rolls and said cylinder to rotate in the same direction, of seed inlet and discharge openings, and means for removing the lint separated by the action of the machine, substantially as described.

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

JAMES J. FAULKNER.

Witnesses:

C. L. BERLIN,
JOHN HALLUM.