No. 672,297.

Patented Apr. 16, 1901.

M. SWENSON & W. E. ANDERSON.

SEED DELINTING MACHINE.

(Application filed July 7, 1896.)

(No Model.)

2 Sheets—Sheet 1.

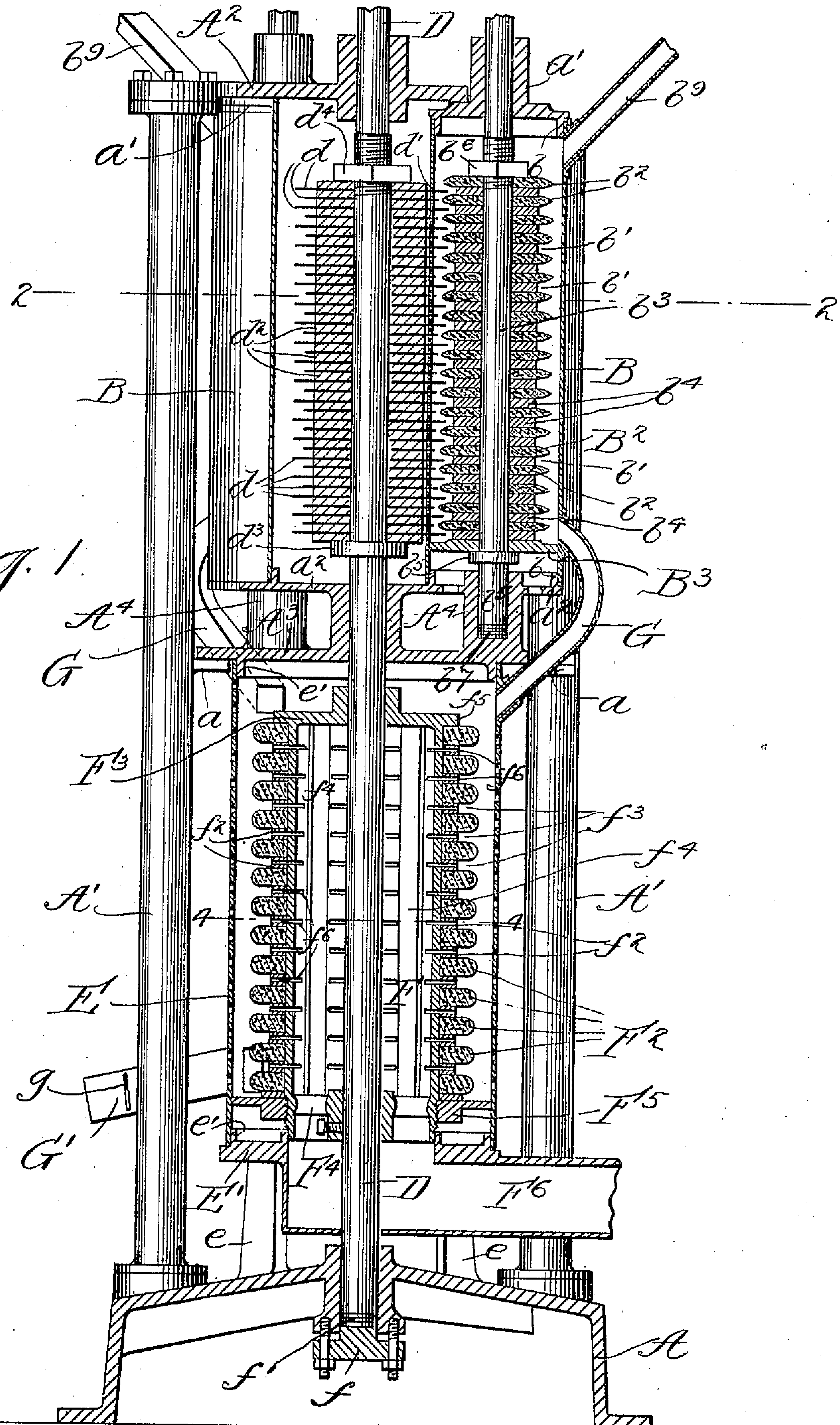

Fig. 1.

Witnesses
Wm. F. Henning
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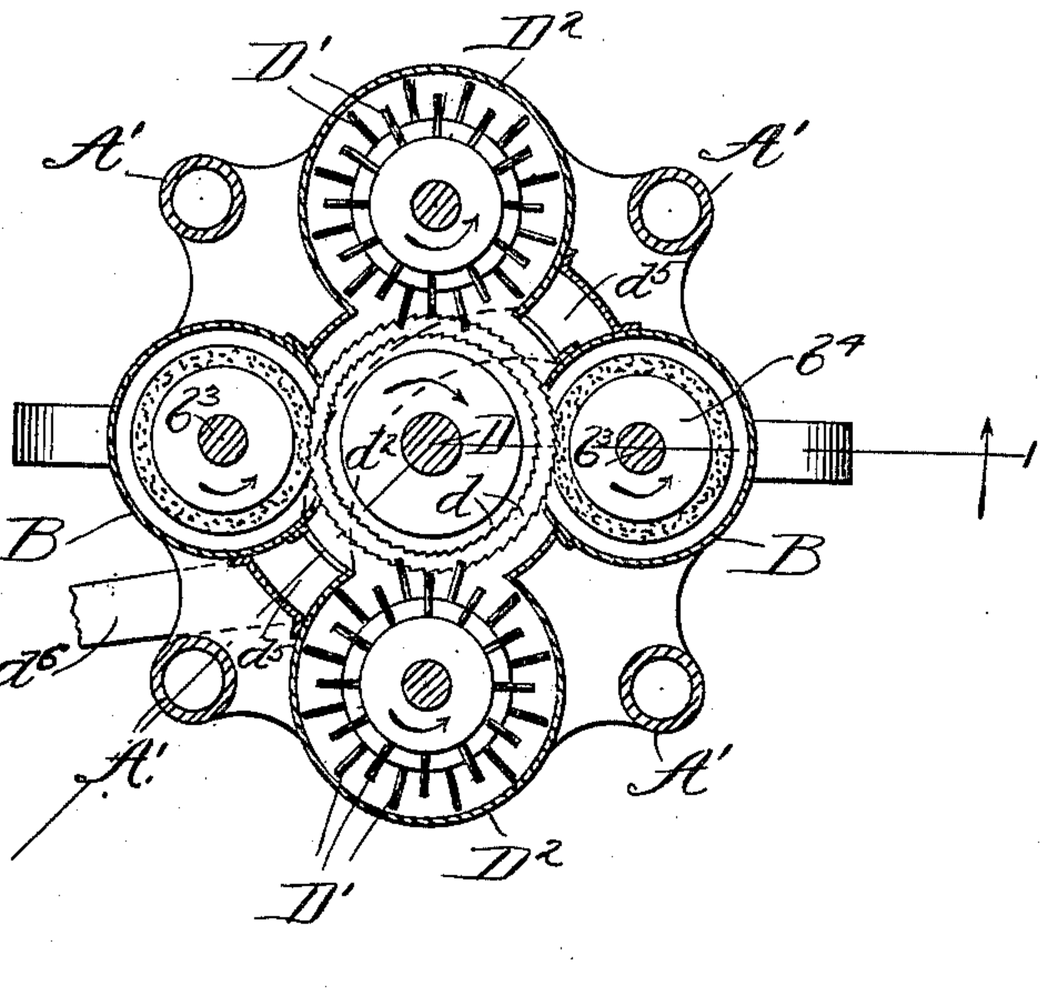

Fig. 2

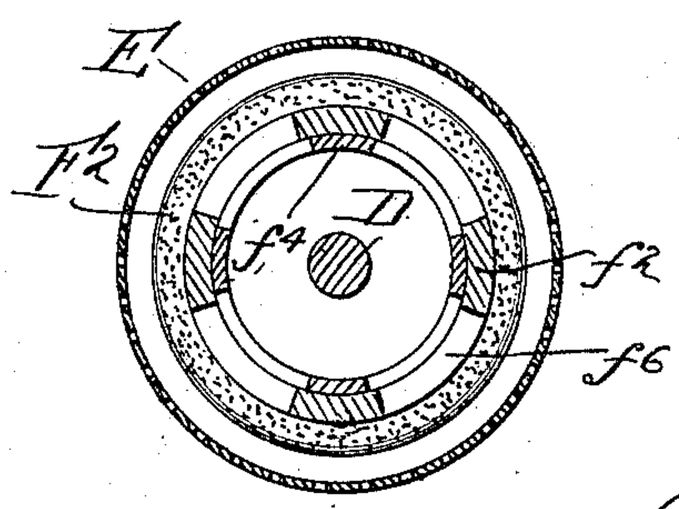

Fig. 4.

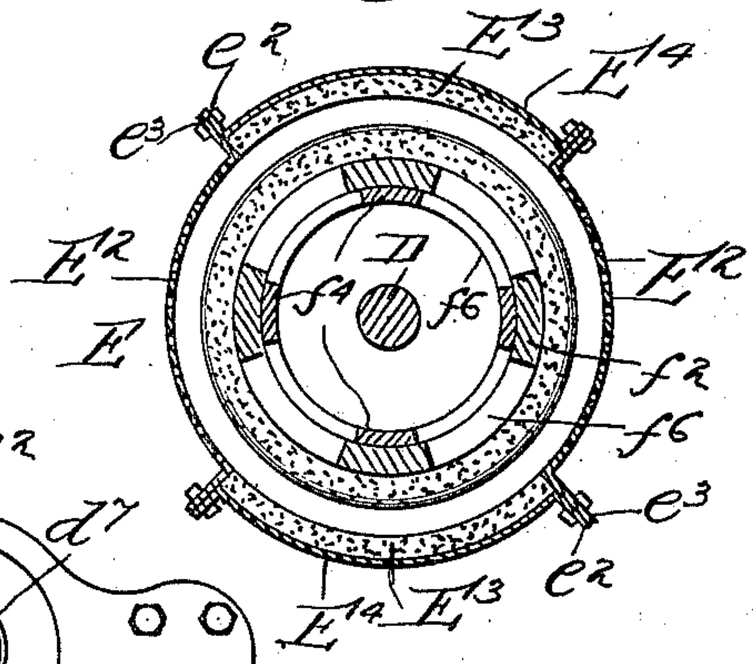

Fig. 5.

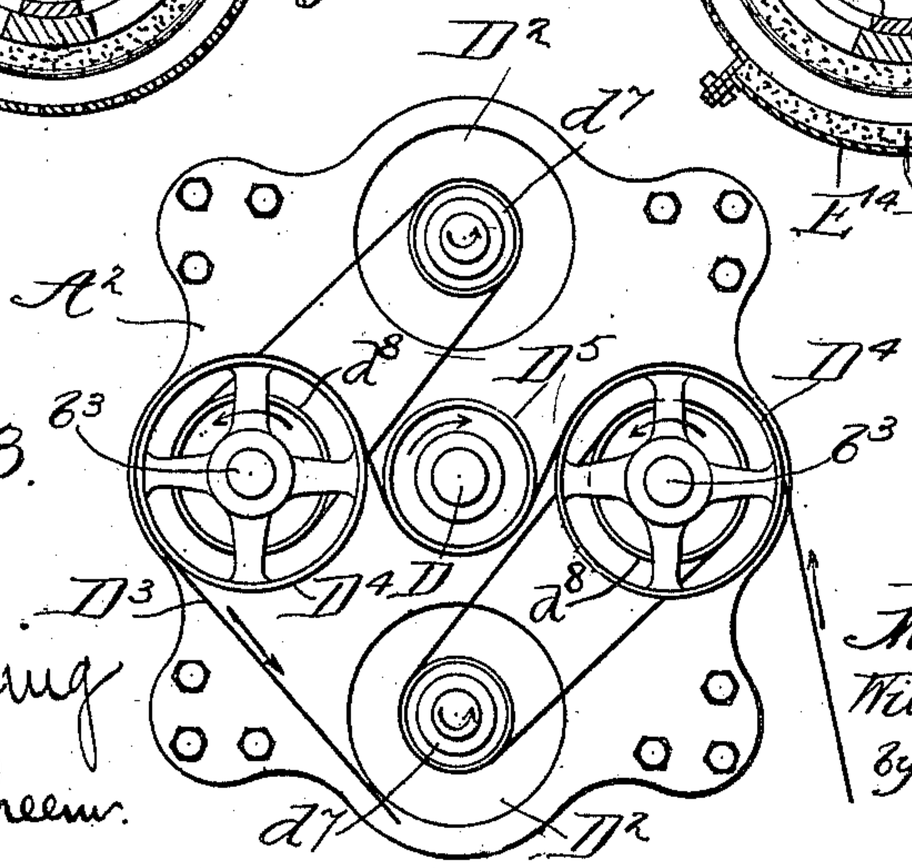

Fig. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

MAGNUS SWENSON AND WILLIAM E. ANDERSON, OF CHICAGO, ILLINOIS.

SEED-DELINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 672,297, dated April 16, 1901.

Application filed July 7, 1896. Serial No. 598,327. (No model.)

To all whom it may concern:

Be it known that we, MAGNUS SWENSON and WILLIAM E. ANDERSON, citizens of the United States, and residents of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Seed-Delinting Machine, of which the following is a specification.

This invention relates to improvements in machinery particularly designed and adapted for removing lint from cotton-seed, commonly known as "cotton-seed-delinting" machinery; and the object of the invention is to provide a new and efficient machine for the purpose.

The invention consists of the various features, combinations of features, and details of construction hereinafter described and then pointed out in the claims.

In the accompanying drawings a machine embodying our invention is fully illustrated.

Figure 1 is a vertical sectional view of a machine embodying our invention on the line 1 1 of Fig. 2 looking in the direction indicated by the arrows. Fig. 2 is a horizontal sectional view thereof on the line 2 2 of Fig. 1. Fig. 3 is a top plan view thereof. Fig. 4 is a horizontal sectional view on the line 4 4 of Fig. 1; and Fig. 5 is a view, similar to Fig. 4, of a modified form of our improved machine.

The frame of our improved machine consists of a base A, adapted to be rigidly secured to the floor, upright posts or pillars A′, rigidly supported upon said base, a frame-section A^2, secured to the tops of said posts or pillars, and a frame-plate A^3, secured to lugs or brackets a, formed on the pillars A′. Secured in vertical position between solid heads a', formed on the upper frame-section A^2, and heads a^2, formed on standards A^4, rigidly secured to or formed integral with the plate A^3, are cylindrical casings B, preferably made of suitable sheet metal, but which may be made of wood or other desired material. As shown, the casings B are secured to flanges b, formed on the heads a' a^2, and which engage the interiors of said casings.

Mounted so as to be freely revoluble in suitable bearings within and concentric with the casings B are abrading-cylinders B^2. As shown, grooves b' are formed in the surfaces of the abrading-cylinders B^2, and as preferably constructed said cylinders consist of a plurality of disks b^2, made of emery or other suitable material, secured to a central shaft b^3, which are separated from each other by rings or washers b^4. Said washers b^4 will preferably be made of wood, but may be made of emery or other abrading material, and their diameter is less than that of the disks b^2, thus forming the desired grooves or corrugations in the surface of the said abrading-cylinder B^2. As shown, the disks b^2 and rings or washers b^4 are secured to the shafts b^3 by clamping them between collars b^5, shrunk upon the lower ends of the shafts b^3, and nuts b^6, threaded to the upper ends of said shafts b^3. The thrust due to the weight of the cylinders B^2 is taken by the lower shaft-bearings, and the ends of said shafts b^3 rest upon loose hardened and ground washers b^7, which operate in a familiar manner to prevent friction between the ends of the shafts and the ends of the bearings.

Secured to the shafts b^3, directly below the abrading-cylinders B^2, are disks or plates B^3, which are of such diameter that they will not allow seed to pass between them and the sides of the casings B and which thus prevent the seed contained in said casings from coming into contact with the stationary lower ends of said casings. To provide for the convenient removal of dust and dirt from the spaces below said disks or plates B^3, holes b^8 are formed in the lower heads a^2 of said casings.

Seed is delivered to the interior of the casings B through spouts or chutes b^9, which lead to openings formed in the sides of said casings, adjacent to the upper ends thereof, and said casings are provided with discharge-openings formed in the sides thereof, immediately above the disks or plates B^3.

Secured to a vertical shaft D, revolubly mounted in suitable bearings formed in the frame-plates A^2 A^3, are a series of saws or toothed disks d, and the position of said shaft D relating to the casings B is such that the saws d thereon will extend through slots d', formed in said casings B, into the interiors thereof. In the construction shown the saws d are separated by means of washers d^2 and are secured to the shaft D by being clamped between a collar d^3, shrunk thereon, and a nut d^4, threaded thereto. The saws

d operate in a familiar manner to separate the lint or fiber detached by the action of the abrading-cylinders B^2 from the mass of seed contained within the casings B^2.

Owing to the different specific gravities of delinted seed, undelinted seed, and detached lint the centrifugal action of the abrading-cylinders B^2 tends to separate the mass contained within the casings B into different layers, comprising an outer layer of delinted or partially-delinted seed, an inner layer of detached lint, and an intermediate layer of undelinted seed. While the said layers are by no means well defined, the lint as soon as it is detached from the seed will gradually work toward the center of the mass and accumulate in the grooves b'. For this reason the saws d preferably comprise saws which extend into and as close as practicable to the bottoms of said grooves b', where the loose lint is most likely to accumulate. Said saws may also comprise other saws, placed intermediate the saws which extend into the grooves b'. Said intermediate saws will thus be opposite the disks b^2 and will be correspondingly smaller than the said saws which extend into the grooves b'.

Our improved machine also comprises means for detaching lint from the saws d. As shown, said means comprise brushes D', revolubly mounted one on each side of the saws d, outside of and between the casings B. While brushes are shown for so removing lint from the saws, any other approved or desired means—as, for instance, an air-blast—may be used for this purpose.

The saws d and the brushes D' are inclosed in a casing D^2, the lateral edges of which are attached to the sides of the casings B. The upper end of said casing D^2 is open and the lower end closed, and said casing comprises flues d^5, into which the brushes discharge the lint removed from the saws, the lower ends of which are in open communication with a closed chamber or passage-way d^6, from which the air may be exhausted by means of an exhaust-fan. (Not shown.) The draft thus created will operate to remove loose lint from the casing D^2 and the flues d^5. Rotary movement in the direction indicated by the the arrows is imparted to the abrading-cylinders B^2 and to the saws d by means of a belt D^3, adjusted to pulleys D^4, secured to the shafts b^3, and a pulley D^5, secured to the saw-shaft D, driven from any suitable source of power, (not shown,) and rotary movement, also in the direction indicated by the arrow, is imparted to the brushes D' by means of belts adjusted to pulleys d^7, secured to the brush-shafts, and pulleys d^8, secured to the shafts b^3.

Desirable dimensions and rates of rotation for various parts of the machine are as follows: of the abrading-cylinders, length about three feet, maximum diameter about eight inches, rate of rotation about nine hundred revolutions per minute; of the saws, length about three feet, diameter about twelve inches, rate of rotation about six hundred revolutions per minute; of the brushes, length about three feet, diameter about eight inches, rate of rotation about fourteen hundred revolutions per minute.

The portion of our improved machine just described is particularly designed and adapted to remove the longer lint or fiber from the seed. Our improved machine also comprises separate means operating in combination with those just described which are particularly designed and adapted for removing the shorter lint from said seed and which will now be described.

Located beneath the casings B and preferably concentric with the produced axis of the shaft D is a vertically-disposed cylindrical casing E, having closed ends and perforated sides. As shown, the upper end of said casing is closed by the plate A^3, and the lower end of said casing is closed by a plate E', supported upon upright arms or standards e, preferably formed integral with the base A of the machine-frame. As shown, said casing E is secured to flanges e', formed on the plates A^3 and E', which engage the interior of said casing. Mounted in suitable bearings within and concentric with said casing E is a hollow abrading-cylinder, (designated as a whole by F,) the upper end of which is closed and the lower end open. As shown, said cylinder F is secured to a downward extension of the saw-shaft D, the lower end of which is supported in a suitable bearing formed in the base A of the machine-frame, the lower end of which is closed by a cap f, which takes the thrust due to the weight of the cylinder F. Loose hardened and ground washers f' are preferably placed in the bottom of said bearing, upon which the end of the shaft D rests directly and which operate in a familiar manner to prevent friction between the end of said shaft and the end of the bearing or the cap f. The abrading-cylinder F comprises a series of rings F^2, made of emery or other suitable material, between which are inserted rings or washers f^2, of less diameter than that of the rings F^2. A series of grooves or corrugations f^3 are thus formed in the surface of said abrading-cylinder F, in which the centrifugal action of said cylinder will cause the lint separated by the abrading action thereof to accumulate in the manner heretofore described in connection with the upper seed-cylinders B^2. Both the rings F^2 and the rings or washers f^2 are supported upon a skeleton frame rigidly secured to the shaft D by means of a set-screw or in other desired manner and consisting of longitudinal members f^4, secured to an upper solid head F^3 and a lower open spider F^4. In the construction shown the emery rings F^2 and the rings or washers f^2 are secured in position by being clamped between a flange f^5, formed on the head F^3, and a plate or disk F^5, threaded to the lower end of the frame of the abrading-cylinder F. Said

disk F^5 is of substantially the same diameter as the interior of the casing E and operates to support the mass of seed contained in the casing E and to prevent contact thereof with the stationary end of said casing. The rings or washers f^2 are provided with holes or openings f^6, which directly connect the hollow interior of the abrading-cylinder F with the space between said cylinder and the casing E. Said holes or openings f^6 are made of such size that loose lint will be carried freely through the same by a current of air without danger of choking or clogging said opening—say several inches long by one-fourth of an inch wide, being relatively wide as compared with cotton-seed—the centrifugal action of the cylinder F operating to prevent the heavier seed from passing inwardly through said holes. The open lower end of the abrading-cylinder F is in open communication with a closed chamber F^6, formed beneath the plate E′, a suitable hole or opening being formed in said plate E to allow such communication. The air is exhausted from the chamber F^6 by means of a suction-fan, (not shown,) which thus operates to create a current of air inwardly through the perforations of the casing E, the openings f^6 in the washers f^2 and outwardly through the open lower end of the abrading-cylinder F into the chamber or passage-way F^6. Said current of air will carry with it the loose lint, which, as hereinbefore explained, tends to collect in the grooves f^3, with the bottoms of which the openings f^6 communicate. Seed is delivered to the casing E from the casings B through chutes or spouts G, which connect the discharge-openings of said casings B with suitable admission-openings formed in the top of the casing E. The casing E is also provided with a discharge opening or spout G′, which communicates with the interior thereof just above the plate or disk F^5 and which is provided with a slide g, by means of which the size of the discharge-opening can be regulated. The rate of rotation of the abrading-cylinder F is the same as that of the saws d, or, in the present instance, about six hundred revolutions per minute, and desirable dimensions for said cylinder F and casing E are as follows: length of each, about three feet; diameter of the casing E, about twenty inches; of the cylinder F, about eighteen inches.

In Fig. 5 of the drawings we have shown a modification of the casing E, which we will now describe. Said modified form of said casing, which is designated as a whole by E, as before, consists of perforated sections E^2 and plates or panels E^3, of suitable abrading material, removably secured therein. By constructing the casing with the abrading-surfaces the efficiency of the machine is increased, and by making said abrading plates or panels removable provision is made for conveniently cleaning the same in case they become glazed or covered with matted fiber, both of which tend to impair their abrading power. A convenient construction is to secure the abrading plates or panels E^3 to a suitable frame E^4, which is provided with a flange e^2, adapted to be bolted or otherwise secured to flanges or lugs e^3 on the perforated sections E^2 of the casing.

We claim—

1. In a seed-delinting machine, the combination of a gang of saws, two closed seed-casings mounted adjacent to said saws at diametric points, a slot in each of said seed-casings through which the saws extend, an abrading-cylinder mounted in each seed-casing, seed admission and discharge openings in each seed-casing, two brush-casings mounted at opposite sides of said saws and between the seed-casings, and a brush in each of said brush-casings, substantially as set forth.

2. In a seed-delinting machine, the combination of a gang of saws, two closed seed-casings mounted adjacent to said saws at diametric points, a slot in each of said seed-casings through which the saws extend, an abrading-cylinder mounted in each seed-casing, seed admission and discharge openings in each seed-casing, two brush-casings mounted at opposite sides of said saws and between the seed-casings, a brush in each of said brush-casings, and lint-flues between the seed-casings and brush-casings, substantially as set forth.

3. In a seed-delinting machine, the combination of a cylindrical perforated casing, admission and discharge openings therein, a hollow abrading-cylinder mounted within said cylinder, the upper end whereof is closed and the lower end opened, openings in said cylinder connecting the interior thereof with the space between the seed-cylinder and the perforated casing, means for rotating said cylinder, a closed flue or chamber with which the open end of said cylinder is in open communication, and means to create a current of air inwardly through the perforations in the casing and the openings in the abrading-cylinder, and outwardly through the open end of said cylinder into the closed flue or chamber, substantially as set forth.

4. In a seed-delinting machine, the combination of a continuous cylindrical casing having closed ends, and perforated sides, seed admission and discharge openings therein, a hollow abrading-cylinder mounted within said casing, a series of grooves or corrugations formed in the surface of said abrading-cylinder, openings in said cylinder which extend from the bottom of the grooves or corrugations therein to the interior thereof, means to impart rotary movement to said abrading-cylinder, a closed flue or chamber with which the open end of said cylinder is in communication, and means to create a current of air inwardly through the perforations in the casing and the openings in the abrading-cylinder, and outwardly through the open end of said cylinder into the closed flue or chamber, substantially as set forth.

5. In a seed-delinting machine, the combination of a casing having closed ends and perforated sides, seed admission and discharge openings therein, a hollow abrading-cylinder mounted within said casing, said cylinder comprising a series of rings of emery or other abrading material, and interposed rings or washers of less diameter than said abrading-rings, openings in said washers connecting the hollow interior of said abrading-cylinder with the space between said cylinder and the casing, means to impart rotary movement to said abrading-cylinder, and means to create a current of air inwardly through the perforations in the casing and the openings in the abrading-cylinder, substantially as set forth.

6. In a seed-delinting machine, the combination of a casing having closed ends and perforated sides, seed admission and discharge openings therein, a hollow abrading-cylinder within said casing, comprising a series of rings of emery or other abrading material, and interposed rings or washers of less diameter than said abrading-rings, a shaft, a skeleton frame secured to said shaft and connected to said washers, openings in said washers which connect the hollow interior of said abrading-cylinder with the space between said cylinder and the seed-casing, means to impart a rotary movement to said shaft, and means to create a current of air inwardly through the perforations in the seed-casing and the openings in the abrading-cylinder, substantially as set forth.

7. An improved hollow abrading-cylinder for delinters, comprising a series of annular rings of emery or other abrading material, a series of annular perforated washers interposed between said abrading-rings, and a skeleton frame connected to said washers, substantially as set forth.

8. An improved hollow abrading-cylinder for delinters, comprising a series of annular disks of emery or other abrading material, a series of interposed annular perforated rings or washers separating the abrading-rings, means for clamping the said rings together, and a skeleton frame connected to said washers, substantially as set forth.

9. An improved abrading-cylinder for delinters, comprising a series of annular rings of emery or other abrading material, a series of annular rings or washers separating the emery rings, perforations in said annular washers for the passage of lint and air, and a skeleton frame connected to said washers, substantially as set forth.

10. An improved abrading-cylinder for delinters, comprising a head, a series of skeleton arms connected thereto, a plurality of abrading annular rings mounted on said skeleton arms, a plurality of interposed annular washers separating said abrading-rings, and an adjusting-head engaging said skeleton arms, and clamping the abrading rings and washers in place, substantially as set forth.

11. In a seed-delinting machine, the combination of a perforated casing, seed admission and discharge openings therein, a hollow abrading-cylinder mounted within said casing, perforations in said cylinder, means for rotating said cylinder, and a disk or head at the bottom of said cylinder rotating therewith and working in close proximity to the interior of the perforated casing, substantially as set forth.

In testimony that we claim the foregoing as our invention we have hereunto set our hands this 17th day of June, 1896.

MAGNUS SWENSON.
WILLIAM E. ANDERSON.

Witnesses:
J. H. GIBSON,
B. A. JOHNSTON.