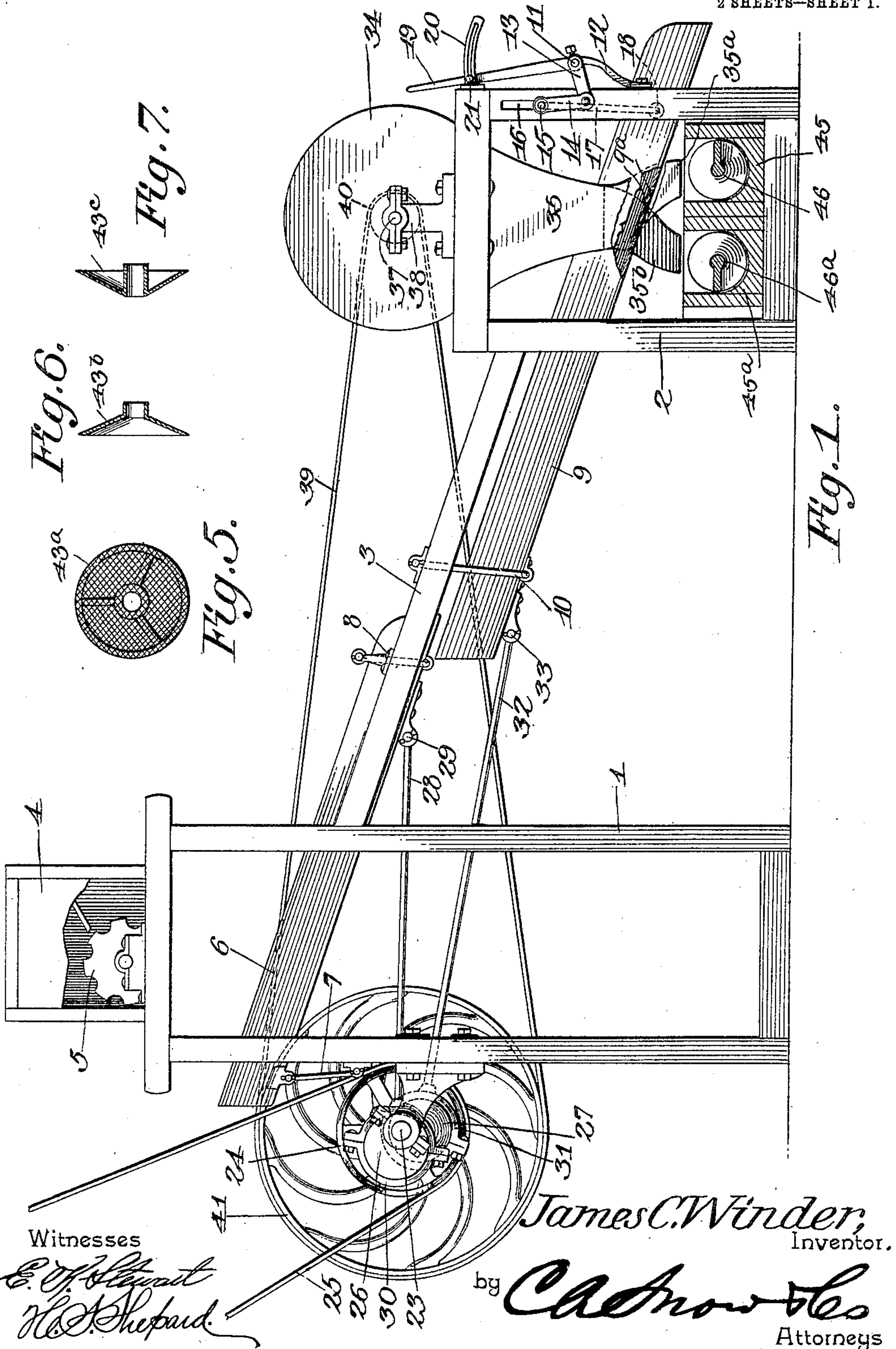


No. 822,416.

PATENTED JUNE 5, 1906.

J. C. WINDER.
COTTON SEED SEPARATOR.
APPLICATION FILED DEC. 31, 1904.

2 SHEETS—SHEET 1.



Witnesses

E. J. Stewart
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by

James C. Winder,
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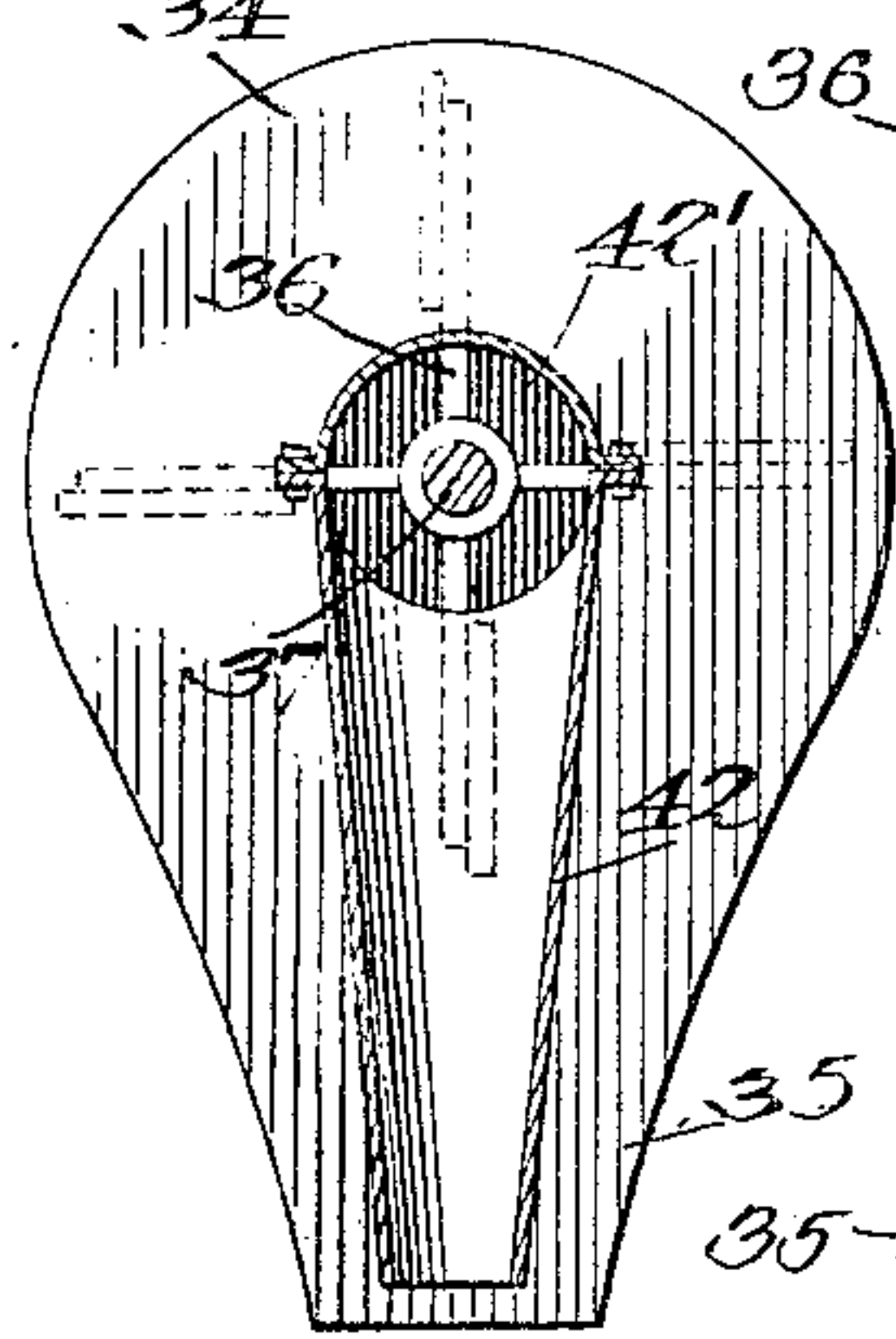
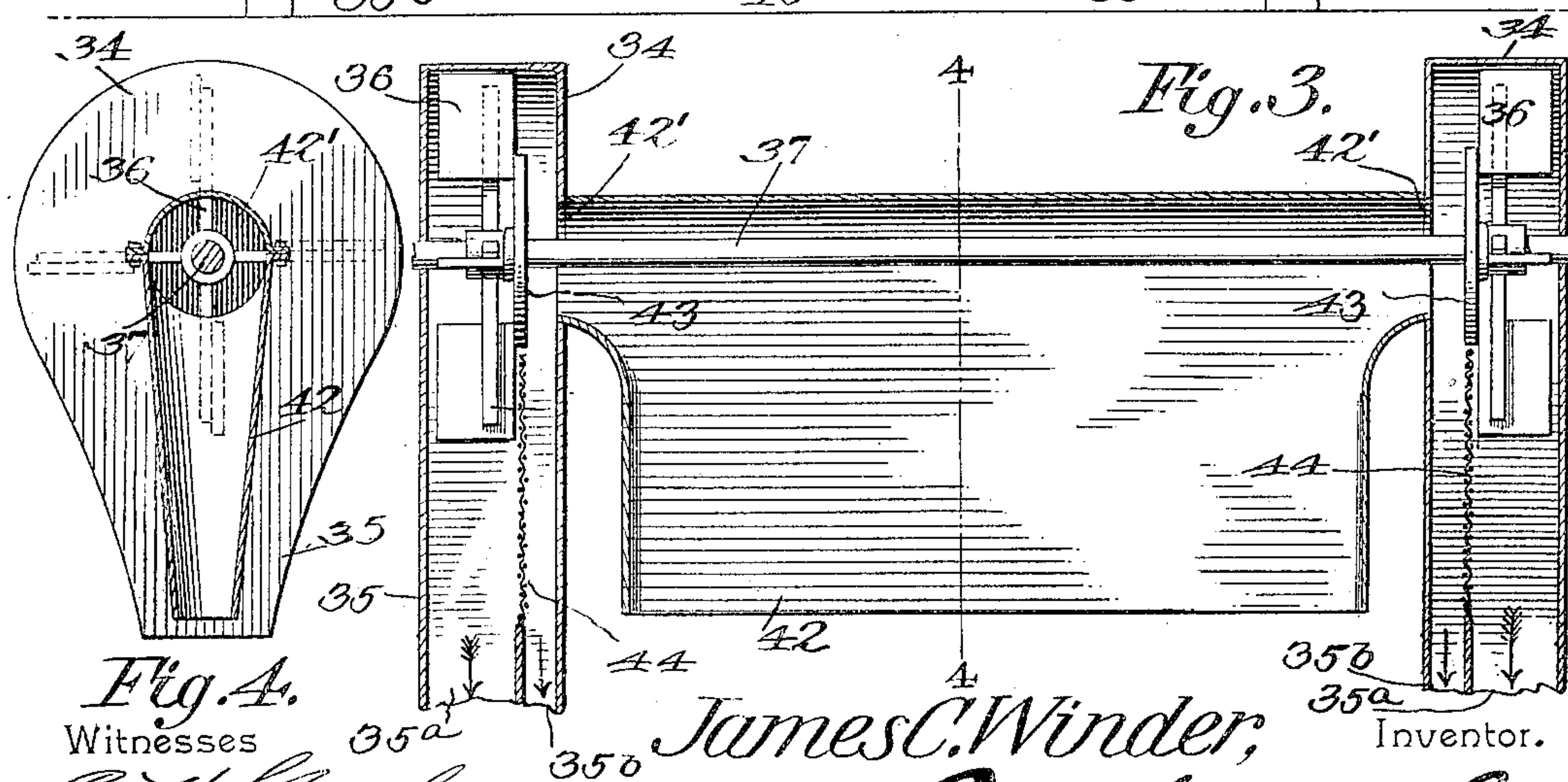
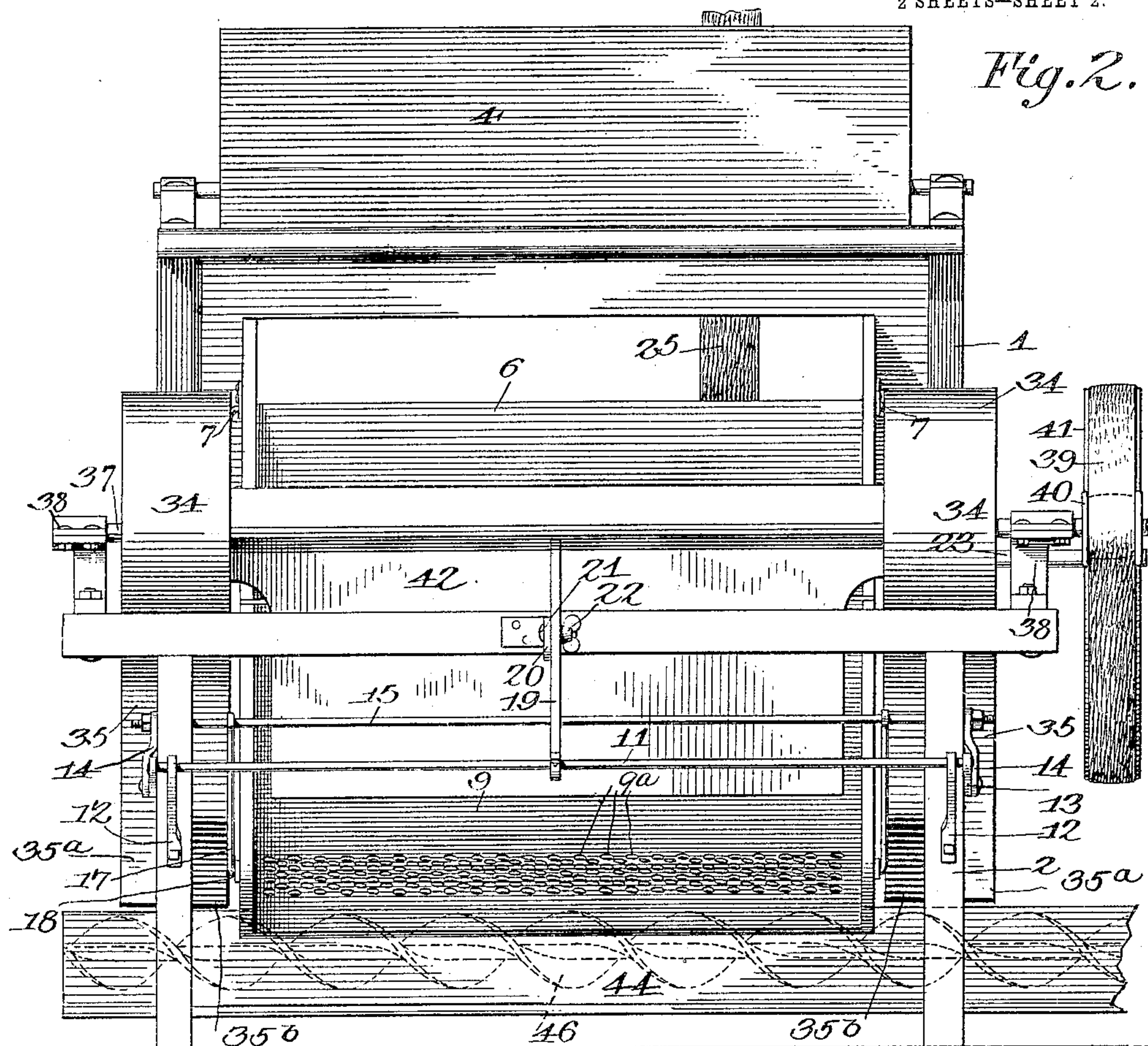
C. A. Snow & Co.
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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

JAMES C. WINDER, OF EAST POINT, GEORGIA, ASSIGNOR TO ATLANTA UTILITY WORKS, INC., OF EAST POINT, GEORGIA.

COTTON-SEED SEPARATOR.

No. 822,416.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed December 31, 1904. Serial No. 239,259.

To all whom it may concern:

Be it known that I, JAMES C. WINDER, a citizen of the United States, residing at East Point, in the county of Fulton and State of Georgia, have invented a new and useful Cotton-Seed Separator, of which the following is a specification.

This invention relates to separating-machines, and has for its object to effect the separating operation pneumatically in a simple and efficient manner.

While the present invention is capable of various applications, it has been particularly designed for the separation of cotton-seed from heavier refuse material.

It is, furthermore, designed to effect an initial separation of the material under treatment into a comparatively thin layer before submitting the material to the action of the pneumatic separating means in order that the suction of the latter may have the most effective operation to insure the separating of the comparatively light cotton-seed from the heavier particles of dirt and other foreign matter.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a side elevation of the separating-machine embodying the features of the present invention, one end of the cotton-receiving trough being broken away to illustrate the conveyor therein. Fig. 2 is an end elevation of the machine. Fig. 3 is a detail sectional view taken through the suction-chamber. Fig. 4 is a cross-sectional view on the line 4-4 of Fig. 3. Figs. 5, 6, and 7 are detail views of different forms of fan-guards.

Like characters of reference designate corresponding parts in each and every figure of the drawings.

For the support of the operating parts of the present invention there is provided a frame made up of a substantially rectangular open head-frame member 1, a shorter foot-

frame member 2, separated from the head-frame member by a suitable interval, these two frames being connected at each side by an inclined side frame-bar 3. Upon the top of the head-frame member 1 there is a feed-hopper 4, having a distributing-roller 5 rotatably mounted therein.

Located below the feed-hopper and working between the sides of the head-frame 1 is a shaking-shoe or agitating member 6 in the nature of a pan inclined downwardly toward the foot-frame member and supported at each side upon swinging links 7 and 8, of which the link 7 rises from the head-frame 1, while the link 8 depends from the adjacent frame-bar 3. Located below the shoe or agitating-pan 6 is another shoe or agitating-pan 9, having its upper end underlapping the lower discharge end of the agitator 6, with its upper end hung from each of the side frame-bars 3 by means of a link 10, the lower end of the agitator 3 being swung from the foot-frame 2 by means of a vertically-adjustable connection, as will now be explained.

Extending across the front of the foot-frame member 2 in a substantially horizontal position is a rock-bar 11, journaled adjacent each end in a bearing-bracket 12, carried by the adjacent upright of the foot-frame 2, the ends of the rock-bar being projected beyond opposite sides of the frame, as will be understood by reference to Fig. 2 of the drawings. Upon each projected end of the rock-bar is a crank-arm 13, which overlaps the outer side of the foot-frame, and a link 14 rises from the free end of the crank-arm, there being a substantially horizontal connecting-bar 15 extending between the upper ends of the opposite links 14, with each end working in a vertical slot or guideway 16 in the adjacent upright of the foot-frame. A link 17 depends from each end portion of the connecting-bar 15 within the foot-frame, with its lower end suitably connected to the adjacent lower end of the agitator 9, as indicated at 18. An adjusting-lever or crank-arm 19 rises from the middle portion of the rock-bar 11 and engages a slotted arcuate guide member 20, suitably secured to the front of the top of the foot-frame 2, the lever being provided with a bolt 21, working in the slot and having a wing-nut 22 to clamp the lever against the guide member, and thereby lock the lever in any adjusted position. By means of this mech-

anism the lever 19 is designed to be manipulated so as to rock the bar 11, and thereby swing the crank-arms 13 in a vertical direction to adjustably elevate the lower end of the agitator 9 through the medium of the links 14 and 17 for a purpose, as will be hereinafter described.

Reciprocating or shaking movements are imparted to the agitators from a drive-shaft 23, journaled across the rear side of the head-frame 1 and provided with a drive-pulley 24, over which runs a driving-belt 25 from any suitable source of power. (Not shown.) A pair of eccentrics 26 and 27 are provided upon the drive-shaft 23, there being an eccentric-rod 28 pivotally connected to the lower portion of the under side of the agitating member 6, as at 29, while the opposite end of the eccentric-rod is provided with an eccentric-strap 30, embracing the eccentric 26, whereby the agitating member 6 is swung back and forth upon its supporting-links 7 and 8. An eccentric-strap 31 embraces the other eccentric 27, and an eccentric-rod 32 extends from the strap 31 to the upper portion of the under side of the agitating member 9, as indicated at 33, the two eccentrics being so disposed as to work the agitators in opposite directions.

At each side of the lower portion of the agitating member 9 is a fan-casing 34, supported upon the top of the foot-frame 2 and rising above and extending below the latter, with the pendent discharge-spout 35 of each casing extending below the top of the agitating member 9. Within each fan-casing is a rotary fan 36, mounted upon a shaft 37, which is journaled at each end in a bearing 38, rising from the top of the foot-frame 2 upon the outer side of each casing. This fan-shaft is driven by an endless belt or other drive connection 39, running over a small pulley 40, upon one projected end of the shaft 37 and a belt or pulley wheel 41 upon one end of the drive-shaft 23. A single suction-spout 42 embraces the fan-shaft 37, with its lower open end extending substantially the full width of the agitator 9 below the top edges of its sides and opening at the top of each end or side concentrically into the respective fan-casings, as at 42', whereby the suction of the fans operates to draw up material from the agitator 9 through the suction-spout 42 into the fan-casings and thence downwardly out through the respective discharge-spouts 35.

As is best illustrated in Fig. 1 of the drawings, it will be noted that the bottom of the agitator 9 is provided with a perforate portion 9^a in alinement with the open lower end of the suction-spout 42 in order that air may be drawn directly through these openings into the suction-spout, so as to obtain the maximum suction effect.

As best illustrated in Fig. 3 of the drawings, it will be seen that a guard disk or

member 43 is carried by the shaft 37 within each fan-casing 34, so as to cover the inner end of the space between the inner ends of the blades of the fan, thereby to prevent the cotton-seed from being drawn in between and damaged by the radial arms and blades of the fan. An upright perforate partition or screen 44 is also provided within the fan-casing and leads downwardly from the lower edge of the guard 43, thereby separating the spout 35 into two longitudinal compartments, with the lower end portion of one compartment inclined or deflected in one direction, as at 35^a, and the corresponding lower portion of the other compartment extended in the opposite direction, as at 35^b. (Best shown in Fig. 1 of the drawings.)

Beneath the corresponding spout portions 35^a of the opposite fan-casings 35 there is a trough or receptacle 45, having an open top to receive the discharge from said spout portions, there being a conveyer 46, preferably a worm, working in the trough, so as to carry the material away from the machine. A similar trough 45^a is located beneath the spout portions 35^b, with a spiral conveyer 46^a working in said trough.

In the operation of the present machine the cotton-seed, with the gravel, dirt, and other foreign matter which is collected therewith after the cotton has been removed from the seed, is fed to the hopper 4, from which it drops upon the agitator 6 and is spread out thereon in a comparatively thin layer. The reciprocating or agitating motion of the pan 6 operates to somewhat retard the downward passage of the material, so as to obtain a thorough agitation of the latter for the purpose of working the heavier particles to the bottom of the material. After the material escapes from the pan 6 it is again treated in the same manner by the pan 9, and, if desired, additional pans may be employed; but in practice two such pans have been found sufficient. As the material passes over the perforate portion 9^a of the lower pan or agitator 9 the upward current of air or suction through the suction-spout 42 draws the comparatively light cotton-seed upward through the suction-spout 42, while the heavier particles of foreign material are not affected by the suction, and therefore pass onward and escape at the lower end of the agitator. After being picked up into the suction-spout 42 the cotton-seed is directed into the fan-casings and is thence discharged downward through the discharge-spouts 35 into the troughs 45 and 45^a, wherein it is carried off by the spiral conveyers 46 and 46^a to any point remote from the machine. It will now be understood that the lower end of the pan or agitating member 9 is vertically adjustable in order that the latter may be adjusted to the proper distance with respect to the open lower end of the suction-spout 42, according to the varying

character of the material under treatment and to the conditions under which the machine is being operated.

It will now be explained that when separating material including different sizes or grades the finer material will be drawn through the screens or perforate partitions 44 and discharged through the spout portions 35^b into the trough 45^a, while the larger particles will not pass through the perforate partitions and will therefore be discharged through the spout portions 35^a into the trough 45, wherefore in addition to separating the precious material from the refuse there is also a separation of the precious material into two grades, all of which is accomplished in the same machine in a very simple and efficient manner.

As the guard 43 is intended to prevent the cotton-seed from being drawn in between the two arms of the fan, it may be imperforate, as in Fig. 3, or perforate, as indicated at 43^a in Fig. 5; but the perforations thereof should be small enough to exclude the finest cotton-seed. In lieu of a flat guard the guard may be convexed, as at 43^b in Fig. 6, or concaved, as at 43^c in Fig. 7, these different forms of guard being employed whenever required on account of different types of fans.

From the foregoing description it will be apparent that the machine of the present invention is exceedingly simple in construction, readily operated and controlled, and efficient for the purpose designed, and in view of its simplicity is exceedingly strong and durable.

Having fully described the invention, what is claimed is—

1. In a separator, the combination with a separating-chute, of fan-casings located at opposite sides of the chute, fans within the casings, a suction-spout located between and common to the two fan-casings with its open inlet end disposed transversely of the chute, discharge-spouts leading from the fan-casings, a receptacle in communication with the discharge-spouts, and conveyer mechanism for the receptacle.

2. In a separator, the combination with a separating-chute, of fan-casings located at opposite sides of the chute, fans within the casings, a suction-spout located between and common to the two fan-casings with its open inlet end disposed transversely of the chute, discharge-spouts leading from the fan-casings and divided into branches, a guard for the eye of each fan and located between the fan and the inlet of the fan-casing, a perforate partition leading from and in substantially the same

plane with the guard to separate the branches of the spout, receptacles for the corresponding branches of the discharge-spouts, and individual conveyer mechanisms for the receptacles.

3. In a separator, the combination of a fan-casing having a discharge-spout divided into branches, a suction-spout leading into the fan-casing, means to support the material under treatment in connection with the suction-spout, a rotary fan located within one side of the casing opposite the inlet thereof, a guard located within the case between the inlet of the case and the fan to close the eye of the latter, a perforate partition within the case and leading from the guard to the dividing-partition between the branches of the discharge-spout, receptacles in communication with the respective branches of the discharge-spout, and conveyer mechanisms for the respective receptacles.

4. In a separator, the combination with a frame, of a drive-shaft mounted thereon, a shaking-pan member mounted upon the frame, means extending between the drive-shaft and the pan to shake the latter, fan-casings supported upon the frame at opposite sides of the pan, a suction-spout having its lower open end disposed transversely across the top of the pan, and communicating with the fan-casings, fans working in the casings, means to drive the fans from the drive-shaft, discharge-spouts leading downwardly from the fan-casings at opposite sides of the pan, an open-top receptacle disposed transversely beneath the pan in communication with the discharge-spouts, and conveyer mechanism working in the receptacle.

5. In a separator, the combination with a chute, of pneumatic mechanism including a fan-casing having a suction-spout in communication with the chute, a rotary fan within one side of the casing and opposite the inlet thereof, a guard located between the fan and the inlet of the casing to close the eye of the fan, and a perforate partition leading from and in substantially the same plane with the guard through the discharge-spout of the casing to divide the spout into branches to effect grading of the separated material.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES C. WINDER.

Witnesses:

B. F. HARRISON,
LENNIE THOMPSON.