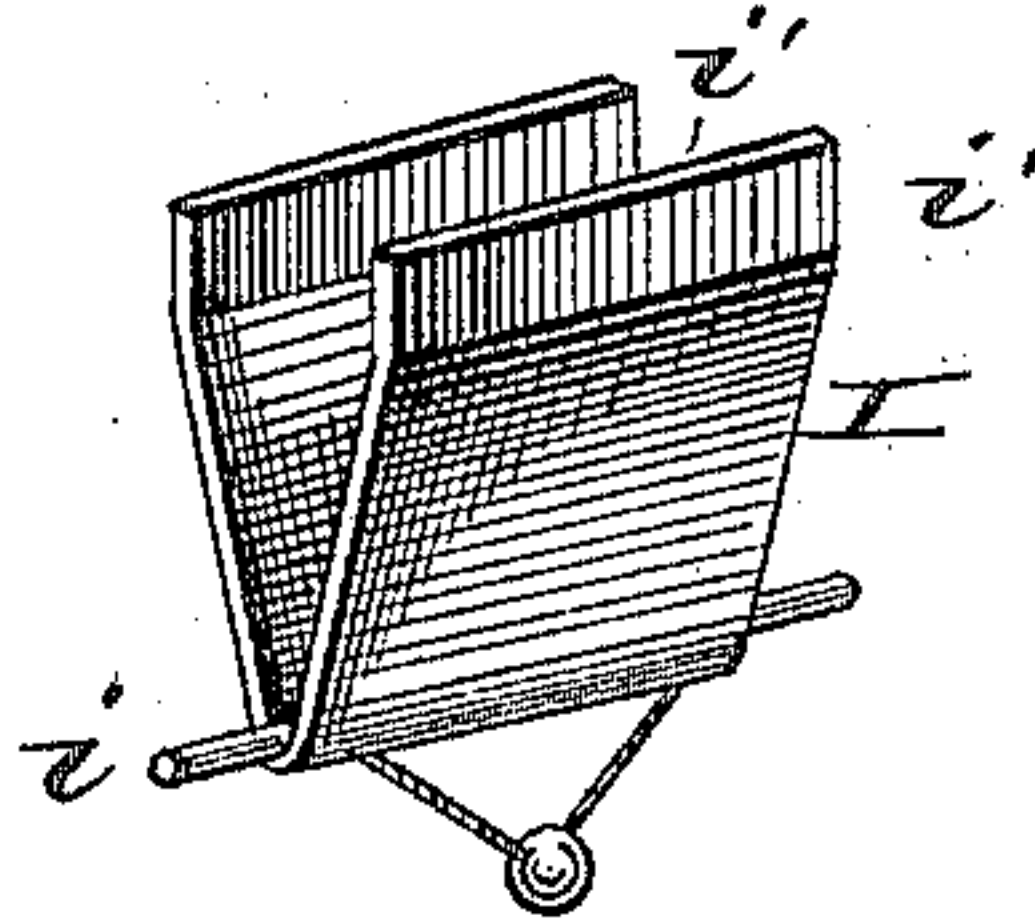


4 Sheets—Sheet 1.

SEPARATOR AND SMUTTER.

Patented June 24, 1884.



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(No Model.)

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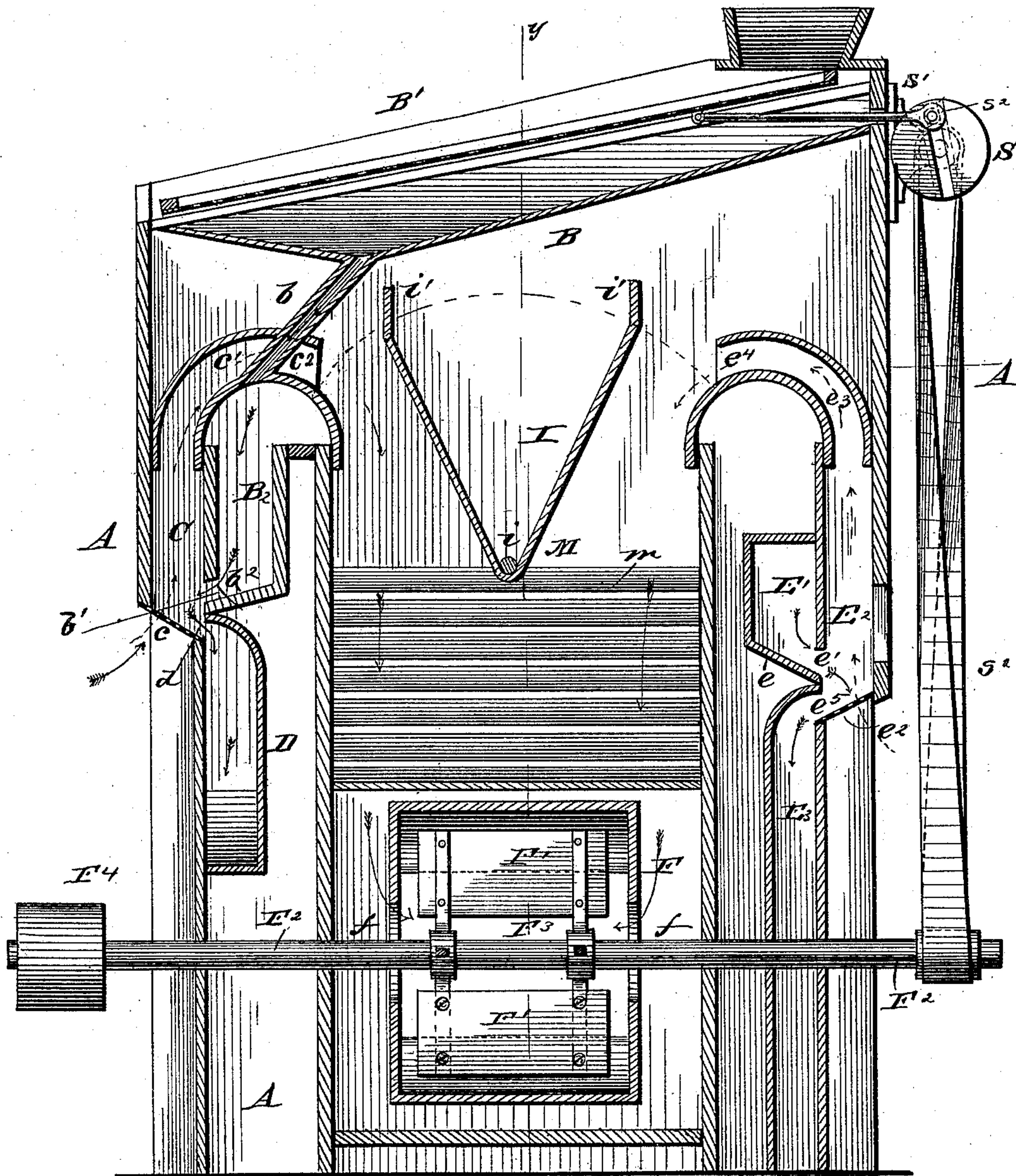
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SEPARATOR AND SMUTTER.

No. 301,013.

Patented June 24, 1884.

Fig. 2.



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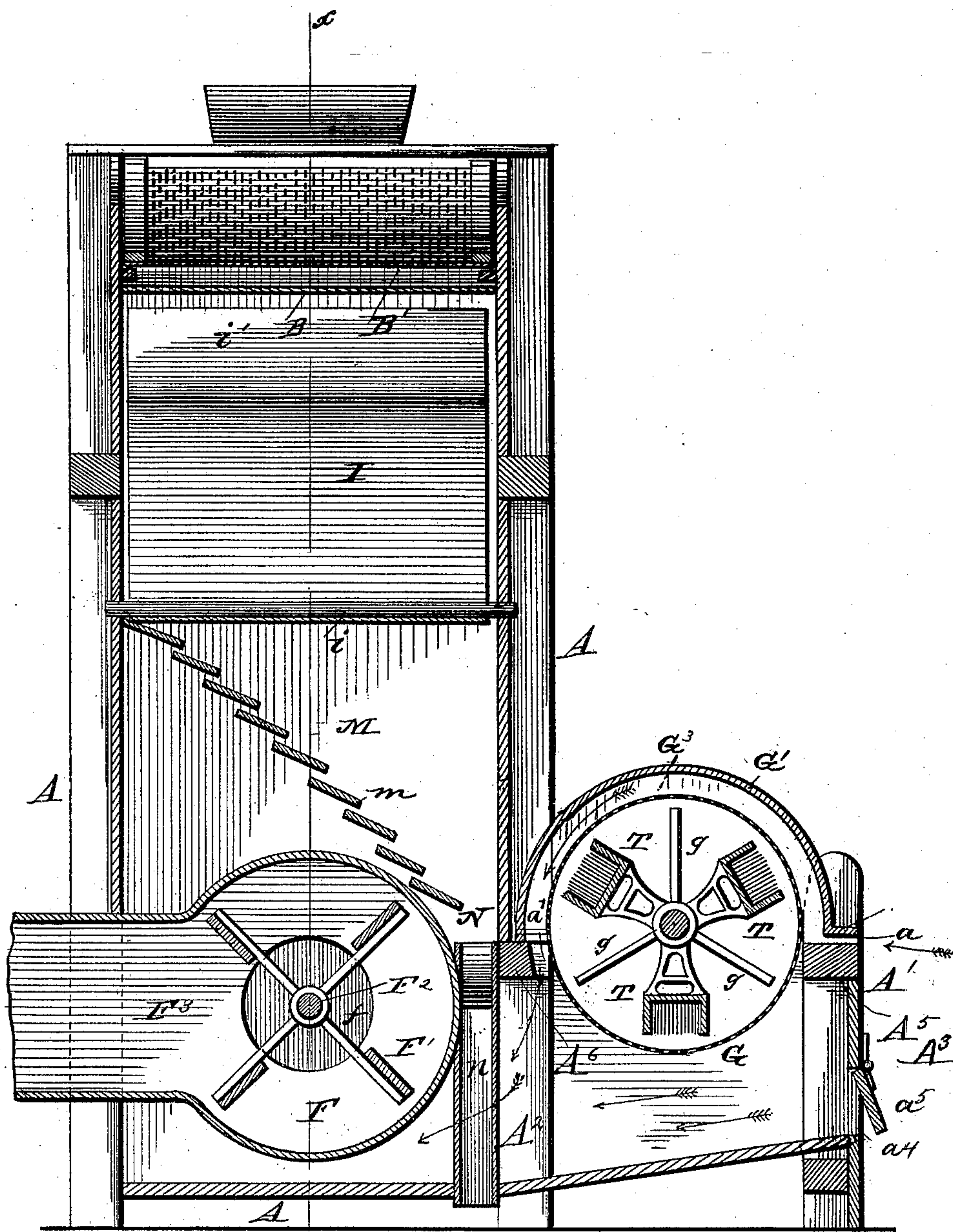
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SEPARATOR AND SMUTTER.

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Fig. 3.



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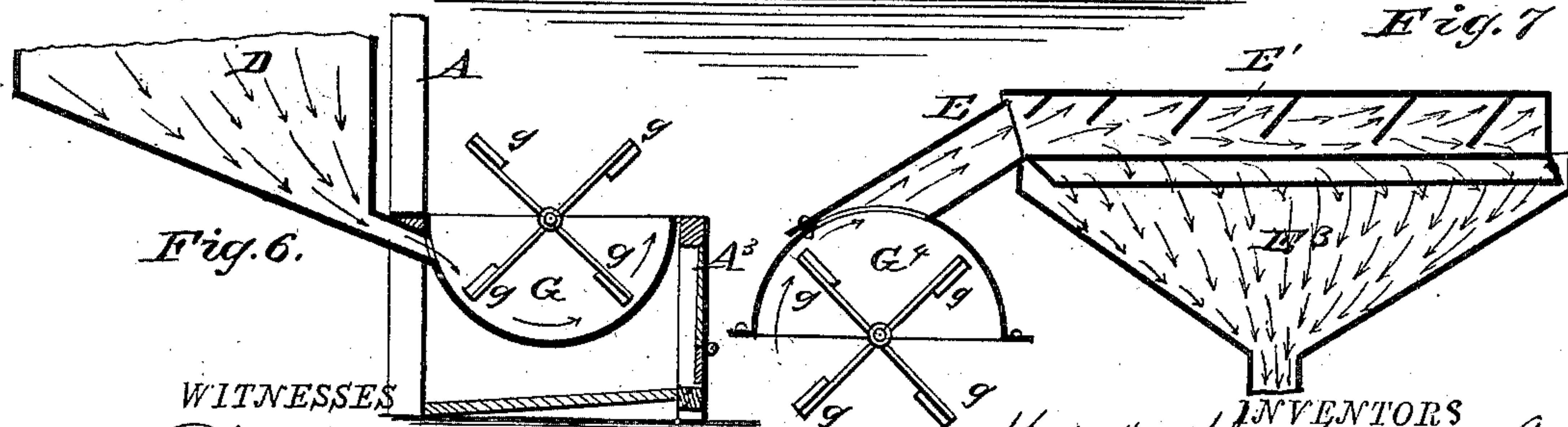
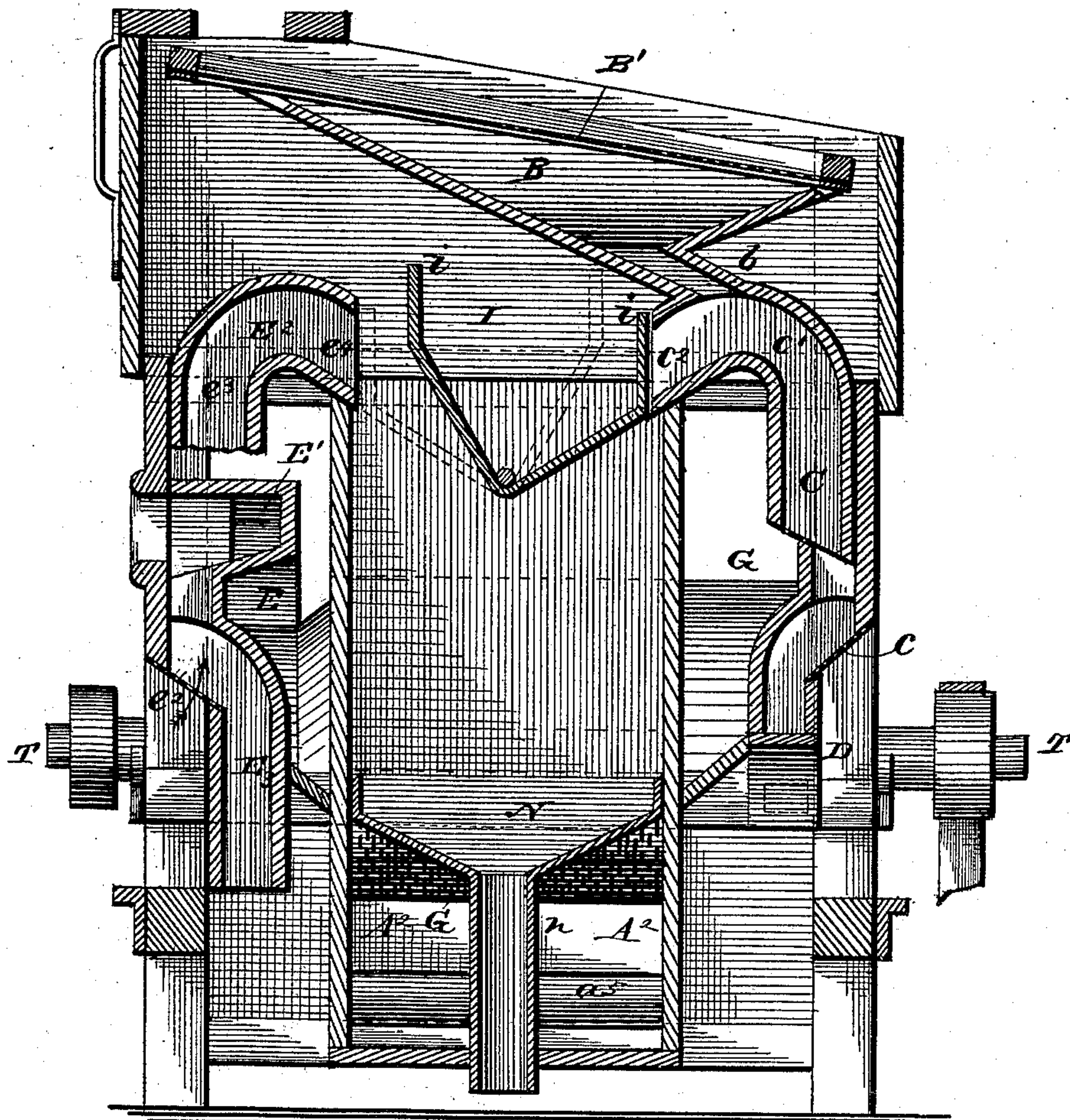
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Fig. 5.



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UNITED STATES PATENT OFFICE.

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ASSIGNORS OF ONE-HALF TO G. DONNENWIRTH, JR., AND J. C. TOBIAS,
OF SAME PLACE.

SEPARATOR AND SMUTTER.

SPECIFICATION forming part of Letters Patent No. 301,013, dated June 24, 1884.

Application filed October 3, 1883. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM N. SHARPNACK and MICHAEL McMAHON, citizens of the United States, residing at Bucyrus, in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Separators and Smutters; and we 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.

The object of our invention is to improve separators and smutters. Our invention therefore consists of the construction and combinations of parts, all as will hereinafter be described in the specification, and pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 represents a perspective of the machine; Fig. 2, a vertical section through the separator on line *x x*, Fig. 3; Fig. 3, a vertical section through the smutter and separator on line *y y*, Fig. 2; Fig. 4, a detail showing the equalizing-valve in perspective; Fig. 5, a section on line *x x*, Fig. 3; Fig. 6, a detail in section showing the connection between spout D and the smutter-cylinder; Fig. 7, a detail showing the connection between the smutter-cylinder and chamber E.

The brushes shown in Fig. 3 are not shown in Figs. 6 and 7, as it is immaterial to this invention what means are used in the smutter for cleaning the grain.

A represents the case, which incloses the several parts of the separating device, and is closed on all sides, except at points hereinafter described. The top is closed by hopper B, placed beneath the riddle B', which may be of the usual form, and provided with the usual pitman, S', suitably connected for converting motion. The part S is connected by belt S' with shaft F', having pulley F', which is connected with any suitable power in the usual way. From the hopper B extend spouts *b*, only one of which is shown, which open into a receiving-chamber, B', having an inclined bottom, *b*², and discharge-opening *b*¹, which leads to a separating-chamber, C, having an inclined perforated bottom, *c*. The upper part, *c*¹, of this chamber is preferably curved, and has an opening, *c*², which

connects the chamber C with the interior of the case, for a purpose which will presently be described. The grain from chamber B² falls upon the inclined perforated bottom *c*, and passes to a passage, D, which communicates with chamber C by an opening, *d*, and leads to the smutter, as shown in Fig. 6. The grain in the smutting-cylinder is gradually worked to the opposite end of the cylinder, and enters the head G¹, which is connected with chamber E' by passage E, through which the grain is projected by the beaters when they come opposite to the passage E, as shown in Fig. 7. Said chamber E' is provided with an inclined bottom, *e*, and an opening, *e*¹, which connects it with a separating-chamber, E², constructed in substantially the same manner as chamber C—that is to say, it is provided with an inclined perforated bottom, *e*², a curved upper part, *e*³, having an opening, *e*⁴, which connects the chamber E² with the interior of the case, and a discharge-opening, *e*⁵, connecting it with a passage, E³, which leads from the machine. The perforated bottom *e*², as well as the bottom *c*, connect their respective chambers with the outer air.

Within the case A is a fan-case, F, open at both ends *f*, and provided with a fan, F', mounted on a shaft, F², journaled in any suitable manner, and extending outside the case, the extension thereof having the usual pulleys thereon. The fan-case is also provided with a discharge-spout, F³, which leads to the dust-room. In front of the fan is an extension, A', of the case A for the smutter-cylinder G, which is connected with the interior of the case by a passage, A². The spout extends vertically through and divides this passage A² into two parts, as shown in Figs. 3 and 5. By locating the fan-case within the case A and having the former open at both ends, the air and dust are drawn from the case with better effect, as no conflicting currents will be generated. The smutter-cylinder is mounted on the extension and provided with beaters and brushes *g* and *t*. The front part of the cylinder abuts against the cross-beam A⁵. The rear beam, A⁶, is provided with a longitudinal slot, *a*¹, which forms a continuation of the passage G³, formed by the cover G', which incloses the top of the cylinder. This cover

G' is attached by one end to the rear beam, A⁶, and extends over to the wall A³ of the extension A', to form an air-passage, *a*, between it and the top beam, A⁵. The ends of the cover are inclosed between the vertical walls *a*³, which are formed with or attached to the extension A'. In the wall A³ below the passage *a* is formed a second passage, *a*⁴, provided with a door or valve, *a*⁵, for regulating the admission of air to the extension A'. The cylinder G is interposed between the fan and the front wall, A³, which is provided with the passages *a* and *a*⁴. When the fan is revolved, the air is sucked in through said passages.

The air entering by passage *a* passes above and around the cylinder to the passage A², and that entering by opening *a*⁴ passes beneath the cylinder, both serving to clear the dust and smut from the latter for the fan to draw away. The fan also acts upon the grain in separating-chambers C and E² by drawing air from the perforated bottoms *c* and *c*² into the case through openings *c*² and *e*⁴. It will be noted that the air is drawn in at the point where the grain is scattered by falling from the inclined bottoms of chambers B² and E'. The refuse will thus be readily separated from the good grain. It happens now and then that one of the chambers B² or E' becomes clogged with grain. The suction through the unclogged passage will therefore be greater than that through the clogged passage. To overcome this objection an equalizing-valve, I, is suspended in the case between the openings *c*² and *e*⁴, so that when the suction is equal in the chambers C and E' the valve will remain stationary or in its normal position; but if the suction becomes greater in one chamber than in the other the equilibrium of the valve will be destroyed by the air drawing upon one side of the valve. In such a case the valve will be drawn or tilted by the unequal suction toward and close the opening through which there is the greatest suction, thus leaving the full force of the fan to act upon the clogged passage until relieved, when the valve will assume its normal position. One means for carrying this object into effect is shown in the accompanying drawings.

The valve I is wedge-shaped, the journal, which has bearings in the case, being at the angle. The ends of the wings of this valve are provided with vertical pieces *i*', adapted to close the openings *c*² and *e*⁴. If desired, a weight may be attached at the angle of the valve to retain it in a vertical or its normal position. The refuse drawn through openings *c*² and *e*⁴ falls upon inclined plates or shelves M, arranged in the case between the fan-case and the openings *c*² and *e*⁴. As the refuse passes from the upper shelves to the lower, the dust and lighter particles are drawn through the spaces between them and into the fan-case, and the screenings pass into the hopper N, which has a spout, *n*, passing through the passage A² and the bottom of the case. By having the fan-case open at both

ends the refuse will fall evenly upon the shelves, and the dust will be more thoroughly separated from the screenings, and by placing the fan-case so that the ends of the case and the ends of the shelves are parallel the best result will be produced.

The operation of the machine is as follows: Grain is fed upon the riddle to be cleaned of straw and other large refuse, which pass off at the lower end. The grain falls into the hopper B, and passes through spouts *b*, chamber B², and passage *b* to the separating-chamber C, where the refuse is partly or wholly removed by the air sucked through the perforated plate *c* and chamber C, as the grain falls upon the former from the chamber B². The cleansed grain passes through passage D to one end of the smutter, and is scoured as it moves toward the opposite end, from which it is ejected by the beaters *g* through passage E to chamber E', and is delivered upon the perforated plate *e*². The dust and broken grain are drawn through the separating-chamber E² to the interior of the case by suction of the fan, and the cleansed grain passes from the machine through passage E³. The refuse drawn through openings *c*² and *e*⁴ falls upon the inclined plates or shelves M, and the fan sucks the dust therefrom and allows the screenings to fall into hopper N, having the spout *n*, which leads out of the case.

We make no claim in this application to the smutter or any of its parts, as it forms the subject-matter of application No. 122,217, filed February 27, 1884, nor to the means for altering the throw of the riddle, as they form the subject-matter of application No. 122,216, filed February 27, 1884.

What we claim as new is—

1. In a separator and smutter, the combination of a case, A, having separating-chambers opening into the case, an equalizing-valve pivoted in said case between the openings of the separating-chambers, and a suction device, substantially as described.
2. In a separator and smutter, the combination of a case, A, having separating-chambers opening into the case, shelves or plates placed below the openings of the separating-chambers, a fan and a fan-case immediately below or under said shelves or plates, having openings at each end, substantially as described.
3. In a separator and smutter, the combination of a case, A, having separating-chambers opening into the case, shelves or plates below the openings, a fan, and a fan-case extending longitudinally below and parallel with the shelves, and open at each end, substantially as described.
4. In a separator and smutter, the combination of a case, A, having separating-chambers opening into the case, a wedge-shaped equalizing-valve pivoted between the separating-chambers, and a suction device, substantially as described.
5. In a separator and smutter, the combi-

5 nation of a case, A, having separating-chambers opening into the case, a wedge-shaped equalizing-valve having its ends bent, substantially as shown, and a suction device, substantially as described.

6. In a separator and smutter, the combination of a case, A, having separating-chambers opening into the case, shelves or plates placed below the openings of the separating-
10 chambers, a fan and a fan-case immediately below or under said shelves or plates, and hav-

ing suitable openings for sucking and expelling the air, substantially as and for the purpose described.

In testimony whereof we affix our signatures 15
in presence of two witnesses.

WILLIAM N. SHARPNACK.

MICHAEL McMAHON.

Witnesses:

A. GRANICK,

M. W. MONNETT.