

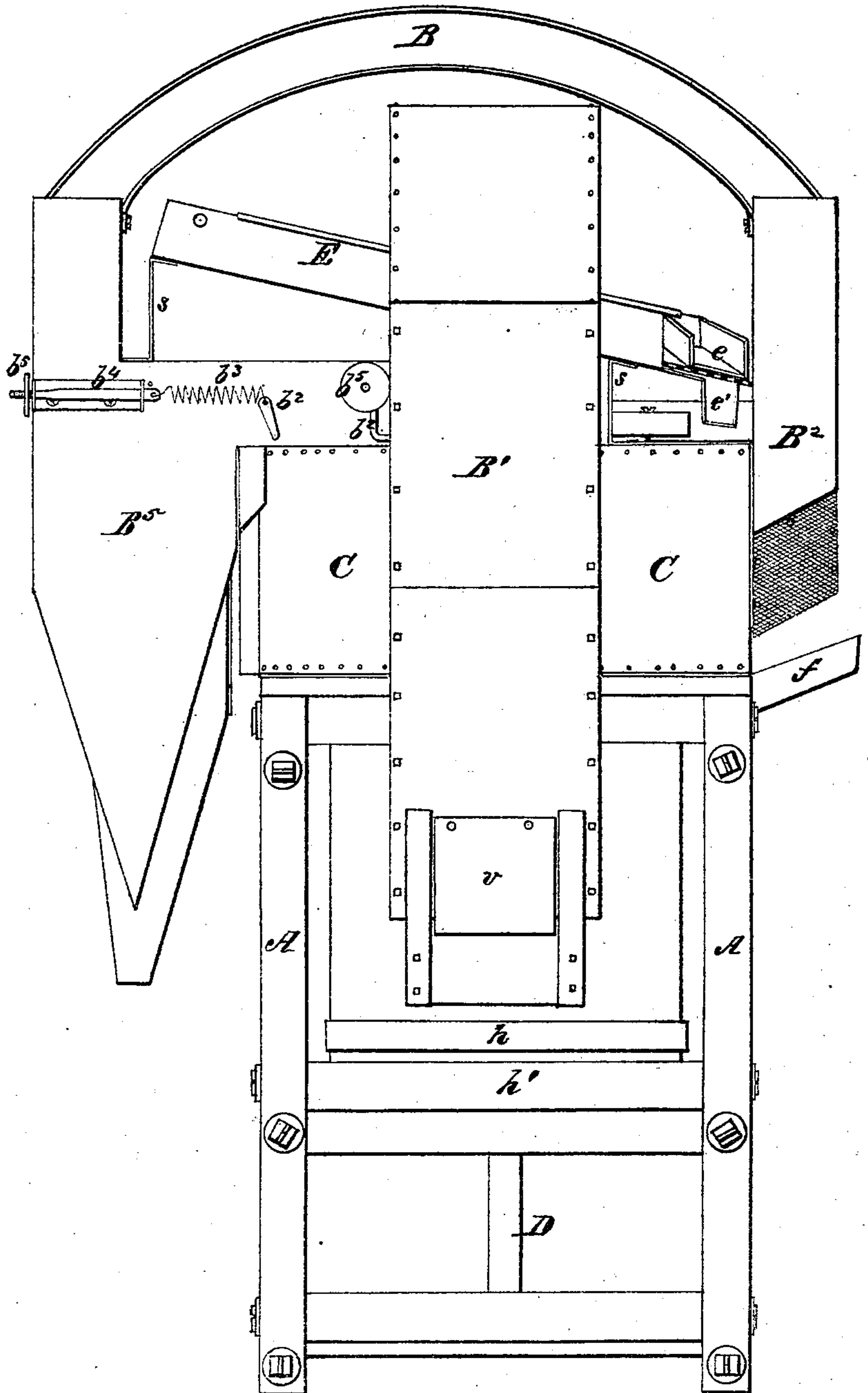
JAMES H. REDFIELD.

Improvement in Grain Cleaner, and Separator.

No. 123,361.

*Fig. 1*

Patented Feb. 6, 1872.



Witnesses.  
*R. J. Campbell.*  
*J. H. Campbell.*

Inventor  
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 by  
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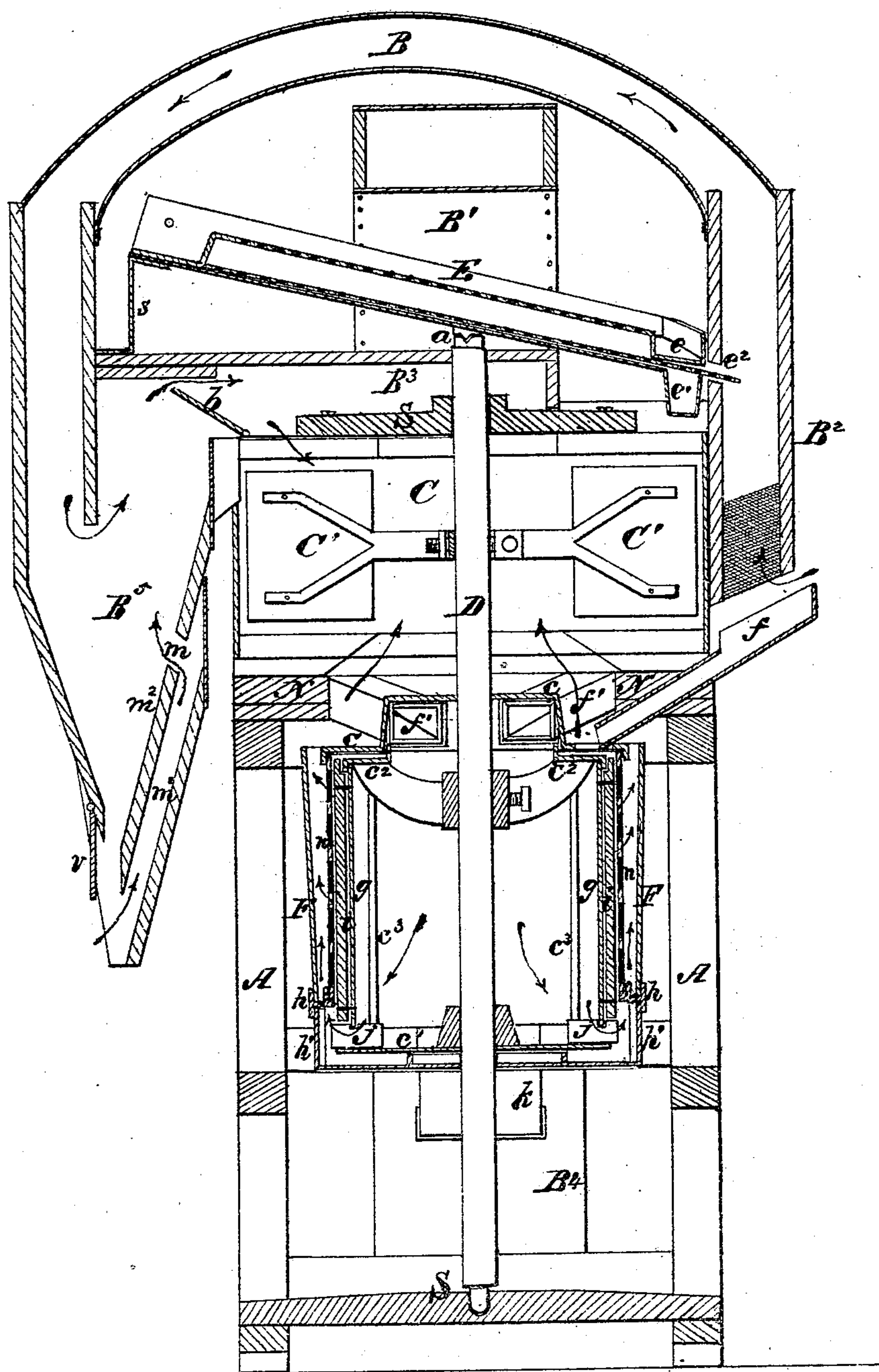
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Fig. 2

Patented Feb. 6, 1872.



Witnesses.  
R. T. Campbell  
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Inventor  
James H. Redfield  
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Marion, Fenwick & Lawrence



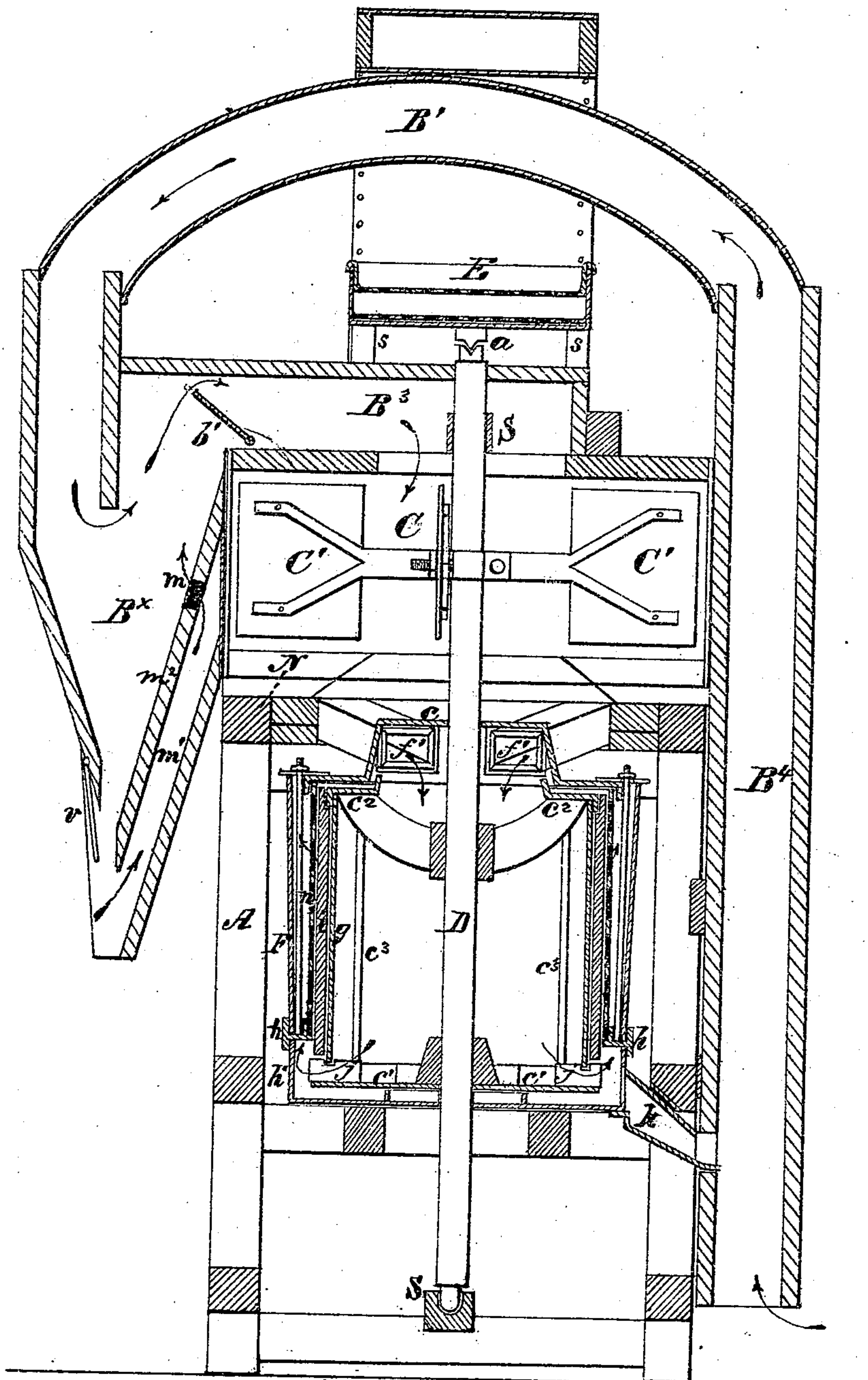
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Fig. 3



Witnesses.  
R. P. Campbell  
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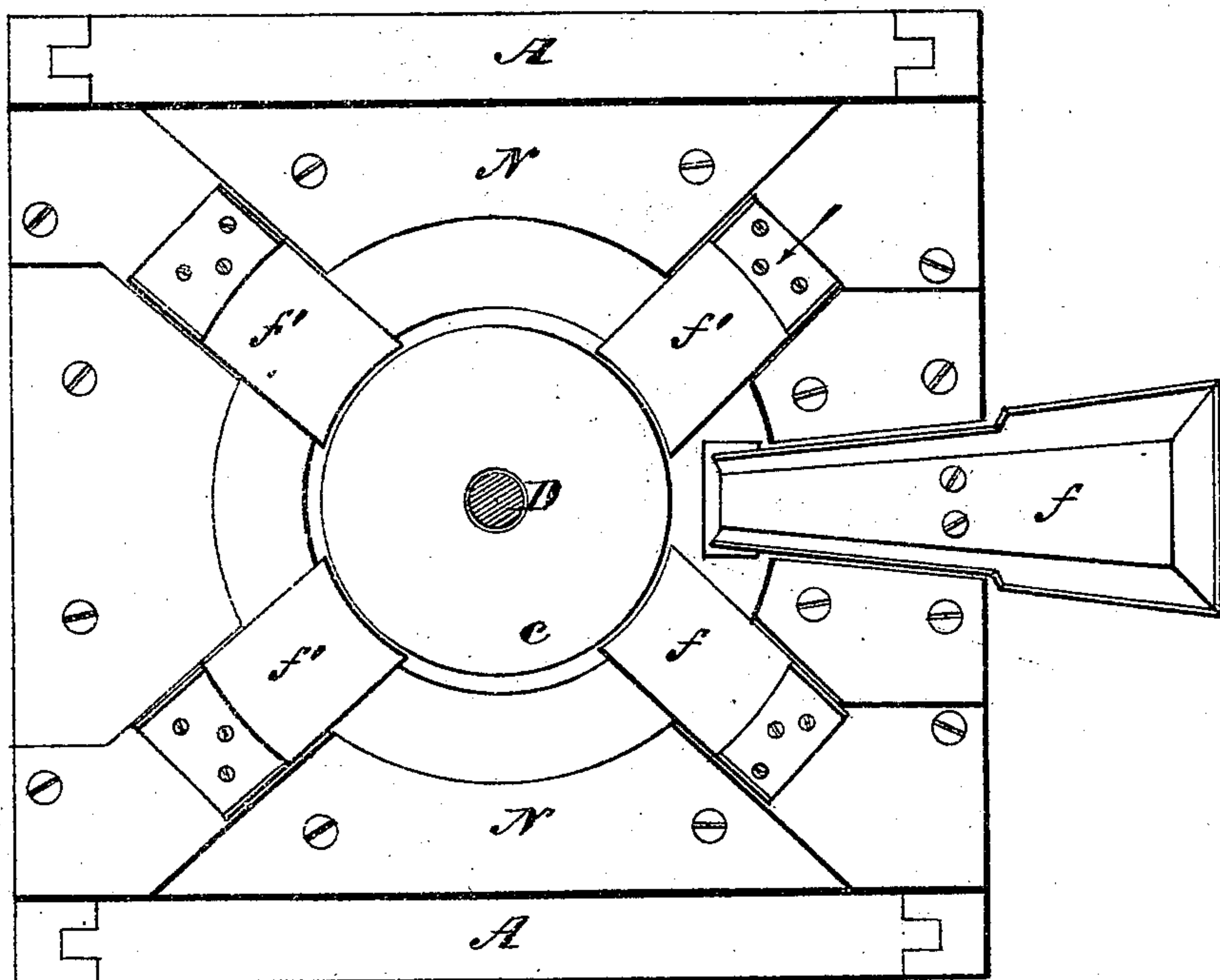
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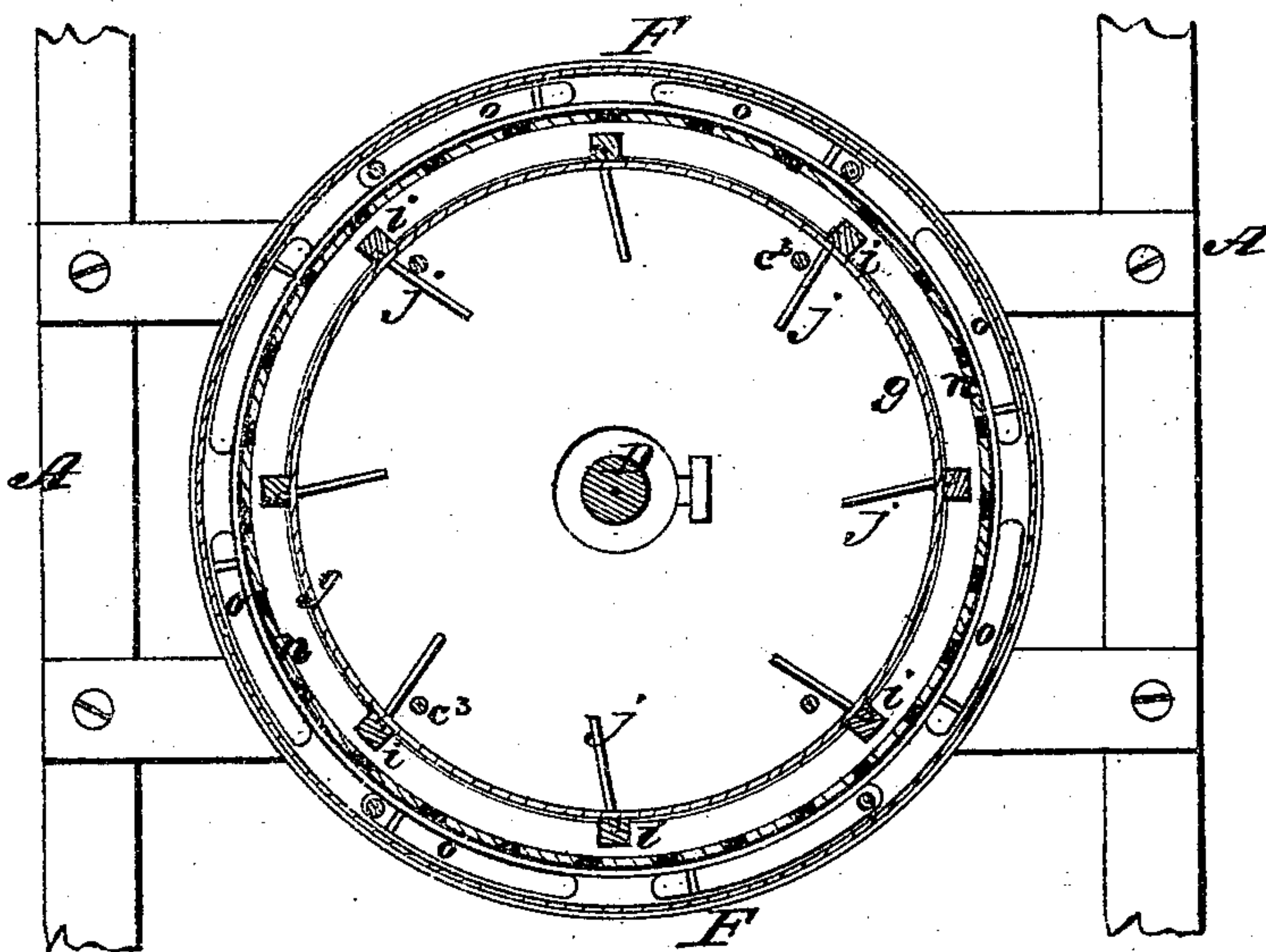
*Fig. 4*

No. 123,361.

Patented Feb. 6, 1872.



*Fig. 5*



Witnesses.  
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J. H. Campbell.

Inventor,  
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Mason, Penick & Lamm.



## UNITED STATES PATENT OFFICE.

JAMES H. REDFIELD, OF SALEM, INDIANA.

## IMPROVEMENT IN GRAIN-CLEANERS AND SEPARATORS.

Specification forming part of Letters Patent No. 123,361, dated February 6, 1872.

*To all whom it may concern:*

Be it known that I, JAMES H. REDFIELD, of Salem, in the county of Washington and State of Indiana, have invented certain Improvements in Grain-Cleaners and Separators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1, Plate 1, is an external elevation of one side of the machine. Fig. 2, Plate 2, is a section taken vertically and centrally through the machine. Fig. 3, Plate 3, is a vertical central section taken in a plane at right angles to the sectional plane of Fig. 2. Fig. 4, Plate 4, is a view of the top of the beater case, showing the air-spouts directed toward the center of the same. Fig. 5, Plate 4, is a section taken horizontally through the beater-cylinder and shells surrounding it.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to certain improvements for scouring grain and separating all impurities from it. It has reference, more particularly, to the rapid separation of light foreign substances from the grain while being scoured or acted upon by beaters upon the surface of a revolving drum. The air-blast is caused to pass down through this drum and escape at its bottom, thence rise on two sides of the perforated beater-case, as will be hereinafter explained; also, to the arrangement of adjustable self-acting valves in the blast-spouts, which will regulate the influx of air, and prevent an undue rush of air through the spouts should the speed of the mill increase beyond what it should, as will be hereinafter explained; also, to a mode of separating from the heavier particles of the screenings all dust, chaff, and scourings, leaving the screenings ready to be ground.

The following description of my invention will enable others skilled in the art to understand it.

In the accompanying drawing, A represents the frame of the machine, in which is supported the beating and scouring devices, and upon which is mounted a fan-case, C, containing fan-blades, C', which are applied to a vertical beater-carrying shaft, D, as shown in Figs. 2 and

3. The fan-case is open above and below. The lower opening communicates with the upper open end of an inwardly-flaring case, F, in which the beating apparatus is inclosed, and the upper opening communicates with the central chamber, B<sup>3</sup>, of two arched trunks, B B<sup>1</sup>. The upper end of the shaft D passes through said trunk-chamber, and is connected to the bottom of a riddle-shoe, E, by means of an eccentric, *a*, which, as this shoe is supported upon springs *s s*, gives to it a vibrating, shaking motion. The shoe E has two riddles—a coarse one above and a finer one below. The good grain passes through the coarser screen upon the finer, and is by the latter conducted down through an opening, *e*<sup>2</sup>, and discharged into the vertical spout B<sup>2</sup> of trunk B, while the impurities which are separated from the grain escape from the shoe through lateral troughs *e e*<sup>1</sup>. On the opposite side of the machine to the spout B<sup>2</sup>, the trunk B terminates in a spout, B<sup>5</sup>, which tapers downward to discharge-openings below, at which point there is a valve, *v*, and which is divided by an inclined partition, *m*<sup>2</sup>, perforated, *m*, and forming a passage, *m*<sup>1</sup>. The upper enlarged portion of this spout B<sup>5</sup> communicates with the trunk-chamber B<sup>3</sup>, and is provided with a valve, *b*, as shown in Fig. 2. By reference to Fig. 3, it will be seen that the spout B<sup>x</sup> of the arched trunk B<sup>1</sup> is constructed precisely like the spout B<sup>5</sup>, and is also provided with a valve, *b*<sup>1</sup>, corresponding to the valve *b* at the upper end of spout B<sup>5</sup>. The stem of each valve extends through one side of its spout, and is cranked at *b*<sup>2</sup>, (see Fig. 1;) and to this crank a spring, *b*<sup>3</sup>, is attached, the opposite end of which is attached to a longitudinally-movable slide, *b*<sup>4</sup>, on which a thumb-screw, *b*<sup>5</sup>, is applied. The thumb-screw abuts against one end of the guide for the rod *b*<sup>4</sup>, and, by turning this screw, the valve may be more or less closed; or, in other words, the spring may be made to act with more or less resistance to the valve under a given pressure of air against it. The object of this device is to prevent the currents of air through the spouts to the fan-case from becoming too strong should the speed of the fans be too rapid. The valves *b b*<sup>1</sup> are self-adjusting, and will cause the air-blasts to be uniform in their force, as the springs will allow the valves to close more or less in pro-



portion to the force of the blasts. The spout  $B^4$ , opposite that lettered  $B^x$ , extends down nearly to the base of the machine, and receives into it, near its lower end, a grain-discharging spout,  $k$ , from the hollow base  $h$  of the scouring apparatus, as shown in Fig. 3. The grain, leaving the lower perforated end of the spout  $B^2$ , falls upon an inclined trough,  $f$ , which leads through the cap  $c$  of perforated cylinder  $n$  into this cylinder, wherein is arranged the beating-cylinder  $g$ , with its vertical beating and scouring strips  $i$ . The central portion of the cap  $c$  is raised, and through its sides openings are made, into which currents of air are directed by means of the radial tubes  $f'$ . These currents of air are received into the upper end of the hollow beater-cylinder  $g$ , which end is provided with a cap,  $c^2$ , through the center of which is a large opening surrounded by a flange. The currents descend through the cylinder  $g$ , and escape between its bottom plate,  $c^1$  and its lower edge, as shown in Figs. 2 and 3. Between the lower edge of cylinder  $g$  and the plate  $c^1$  is a number of short blades,  $j$ , as shown in Figs. 2, 3, and 5. The lower end of the beater-cylinder  $g$  is received into a circular, hollow, stationary base,  $h'$ , but is raised slightly above the bottom thereof by an annular concentric flange. Upon the upper edge of the hollow base  $h'$  a ring,  $h$ , is fitted tightly, the upper side of which presents two annular flanges, separated by a space, through the bottom of which oblong openings  $o$  are made, as shown in Fig. 5. The outer flange on the ring  $h$  receives into it the lower end of an outer, imperforated, and upwardly-flaring case,  $F$ , while the inner flange of the ring receives into it the lower edge of the perforated beater-case  $n$ , the upper end of which is closed by the cap  $c$ . The air which leaves the bottom of the beater-cylinder  $g$  is drawn up on opposite sides of and through the perforated case  $n$ , out at the upper end of the outer case  $F$ , and through the fan-case  $C$ , as indicated by the course of the arrows in Figs. 2 and 3. The shaft  $D$  is sustained above and below by bridge-trees  $S$ , and it has secured to it the beater-cylinder below and the fans above. It passes through the centers of the hollow base  $h'$ , the cap  $c$ , the fan-case, and the chamber  $B^3$  of the trunks. It will be seen that the currents of air converge toward and pass through the fan-case from the trunks and spouts, and also from the upper end of the case  $F$  surrounding the beater-case  $n$ .

When the machine is in operation, and the grain allowed to flow from the spout  $f$  into the space between the perforated case  $n$  and

beater-cylinder at the top thereof, the grain will be spread and thoroughly beaten and scoured by the action of the strips  $i$  upon it, and the dust, &c., will be drawn through the perforations of case  $n$  into the space between it and case  $F$ , and thence into the fan-case. Part of the air from the beater-case will be drawn up through the perforations  $o$  through ring  $h$ , so as to rapidly convey away all light matters which are freed from the grain during the scouring operation, and discharge them from the machine through the fan-case. The strong blast of air which passes out of cylinder  $g$  at the bottom, and rises up outside of said cylinder and in grain-space, will buoy up the grain, and keep it for a long time under the operation of the beating-blades. At the same time the blast will carry off the foreign matters from the grain as rapidly as they are freed therefrom. The screenings, which fall down through the spouts  $B^x$  and  $B^5$ , and which are acted upon by the uprising blasts of air, are cleaned of lighter particles and separated therefrom by falling upon the inclined partitions  $m^2$ , and escaping out of the machine through the passages  $m$  and  $m^1$ , while the lighter particles are carried off by the blasts or escape at the lower ends of the spouts.

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

1. The radial pipes  $f'$ , arranged, relatively to hollow beater-cylinder  $g$ , for allowing air to enter the upper end of the said hollow beater-cylinder, substantially as described.
2. The opening at the lower end of the beater-cylinder  $g$ , leading through a stationary hollow base,  $h'$ , into the lower end of the perforated case  $n$ , substantially as described.
3. The imperforated case  $F$ , communicating with the interior of the hollow cylinder  $g$  below and the fan-case  $C$  above, in combination with the perforated case  $n$ , arranged substantially as described.
4. The perforated ring  $h$ , interposed between the hollow case  $h'$  and the two cases  $F$  and  $n$ , substantially as described.
5. The adjustable self-acting valve  $b$  or  $b^1$ , arranged substantially as described.
6. The partition  $m^2$ , perforated at  $m$ , and arranged within the spout  $B^5$ , substantially as described.

JAMES H. REDFIELD.

Witnesses:

AZARIAH LANNING,  
DEWITT C. THOMAS.