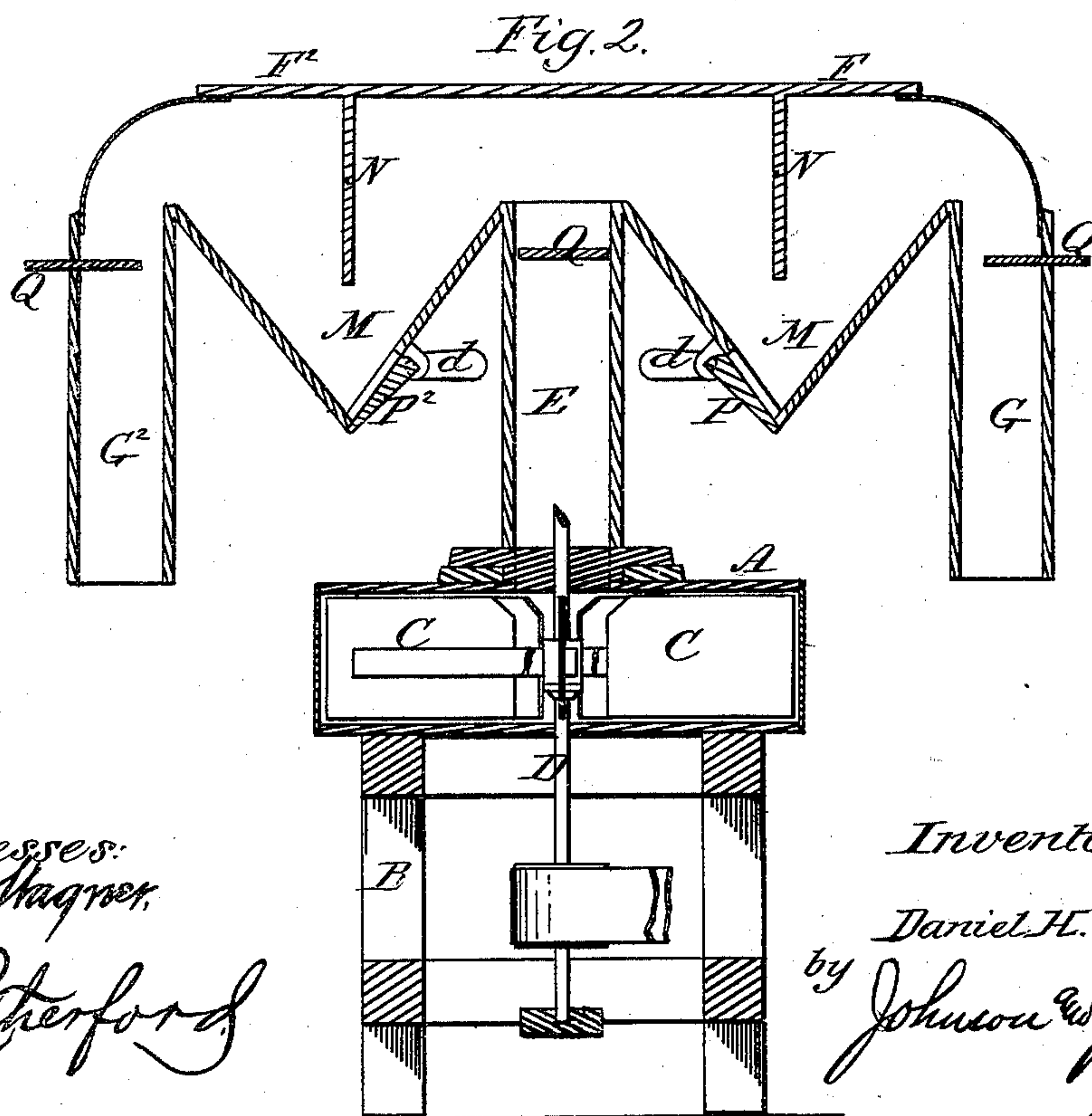
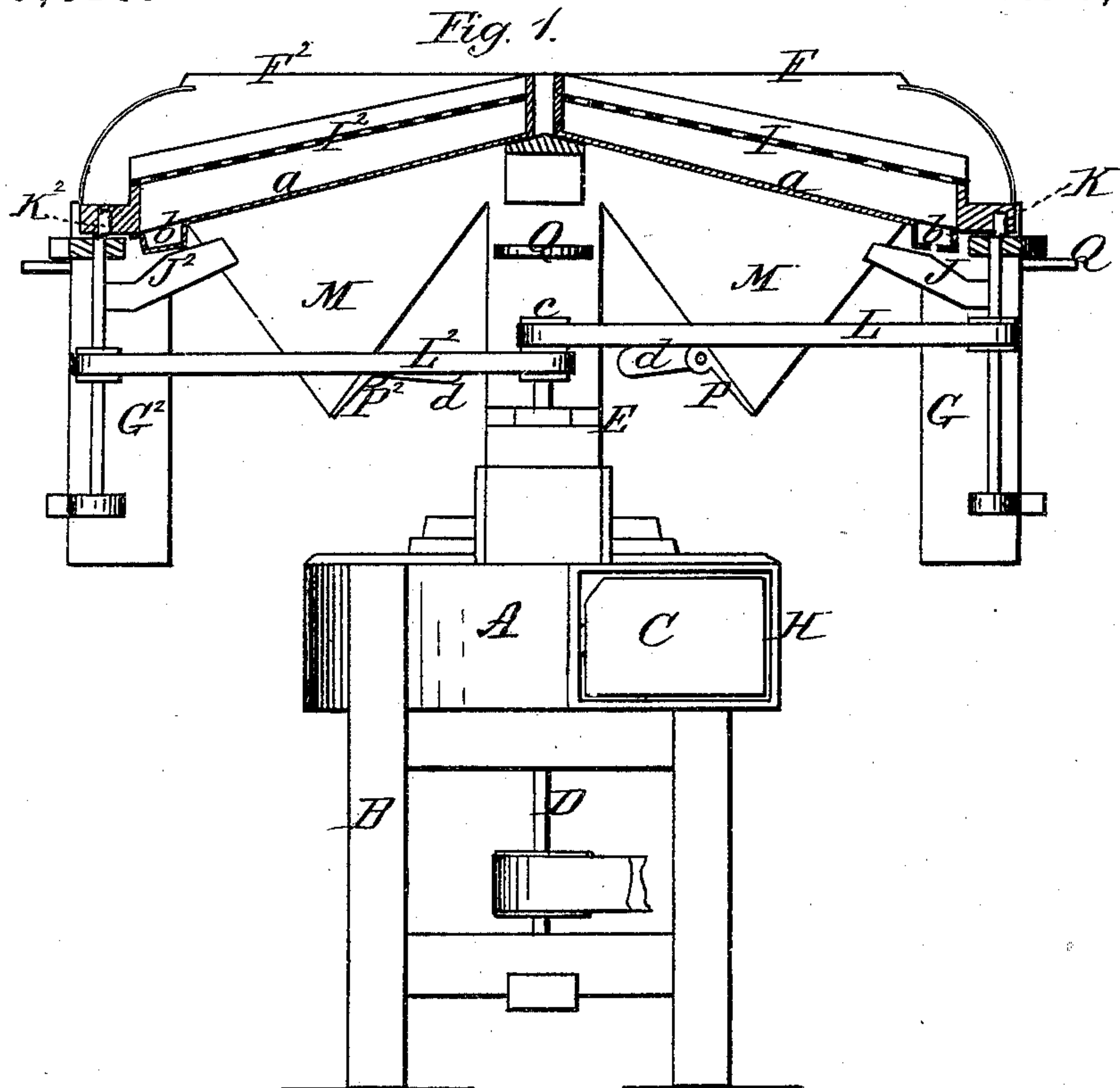


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GRAIN-SEPARATOR.

No. 170,816.

Patented Dec. 7, 1875.



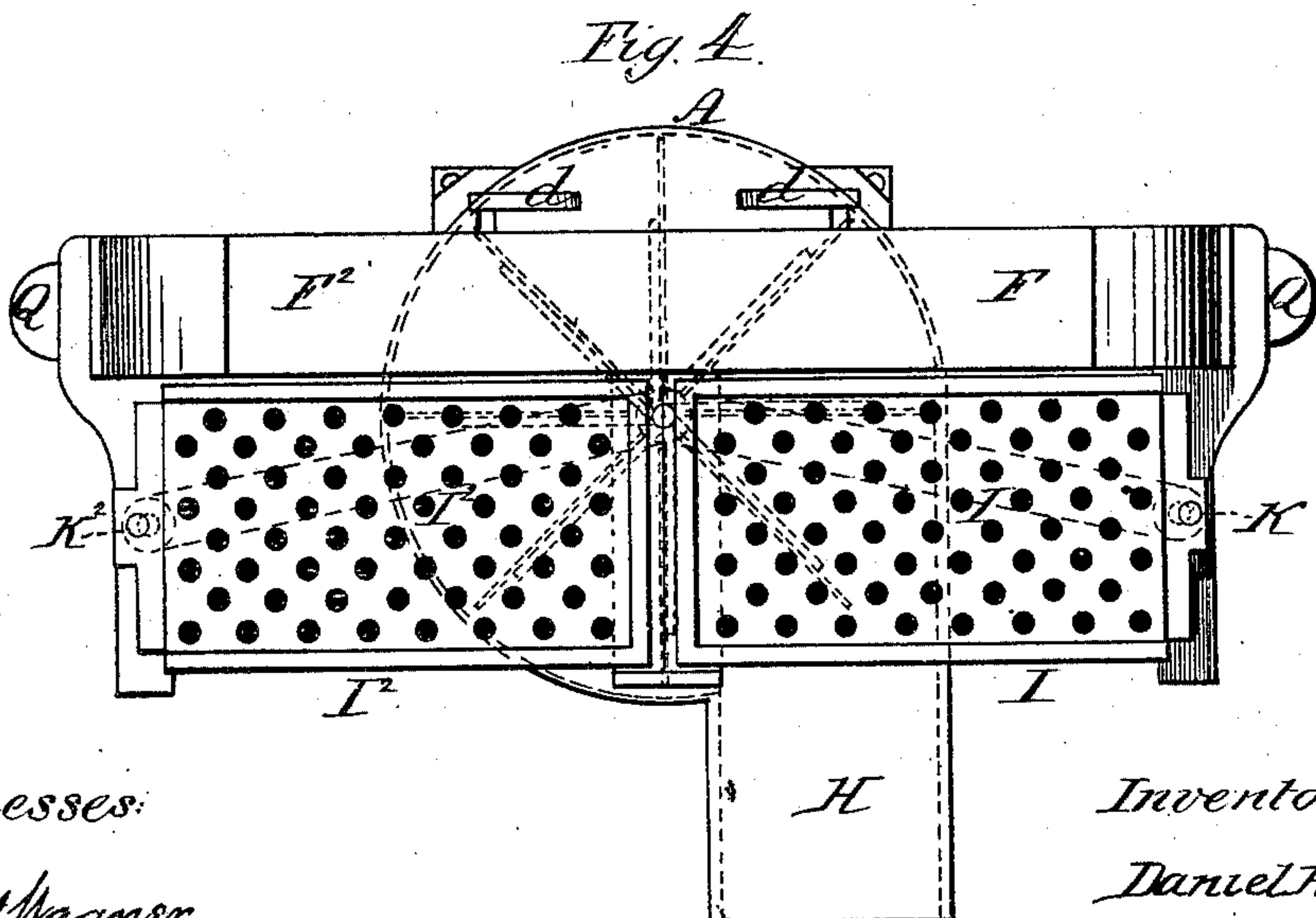
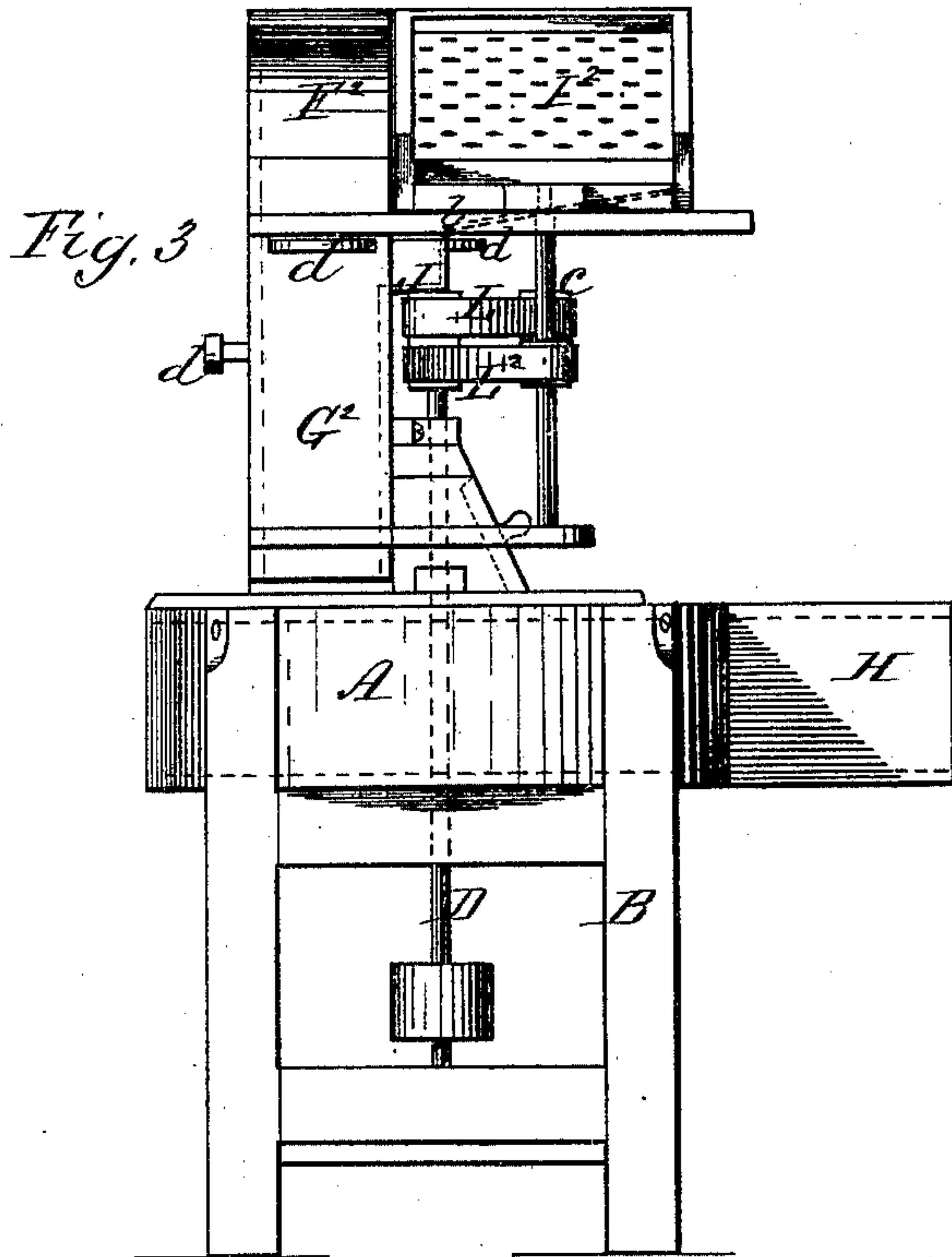
Witnesses:  
*J. H. Wagner*  
*J. H. Rutherford*

Inventor:  
*Daniel H. Caswell*  
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# UNITED STATES PATENT OFFICE.

DANIEL H. CASWELL, OF NASHVILLE, TENNESSEE.

## IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **170,816**, dated December 7, 1875; application filed September 20, 1875.

*To all whom it may concern:*

Be it known that I, DANIEL H. CASWELL, of Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Grain Cleaner and Separator; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to cleaning and separating grain by suction-blast.

The construction and operation of the machine have special regard to its adaptation for cleaning and separating different kinds of grain at the same time and from the same suction-blast, while the latter is regulated to suit light and heavy grain, and maintaining two separate and distinct courses for the feed and discharge of the grain to and from the machine.

In carrying out my invention I combine a blast-trunk, consisting of a vertical section rising from a horizontal suction fan-case and horizontal branches extending equidistant from opposite sides of the central section, and terminating in drop-trunks, open at their lower ends, while between these and the central section are closed drop-chambers, provided with pendent deflectors for interrupting the direct air-currents toward the central section. With this suction-blast superstructure I combine two oppositely-inclined vibrating separators or shakers, upon which the grain is delivered from the hoppers by elevators, and after separating the large stuff, such as wheat-heads, cobs, &c., discharges the grain to be cleaned into the open drop-trunks, which, in passing through the ascending air-currents, is cleaned of all dirt, chaff, cheat, rotten grains, and foreign matters, and which, in passing upward with the suction-blast, strike the pendent deflectors in the intermediate drop-chambers, whereby all heavy stuff fit for feed is precipitated to the bottom of said drop chamber or chambers, while the dust, chaff, and dirt pass into the central section and out through the fan-case.

The drop-chambers necessarily increase the area of the horizontal branches of the trunk, and the draft is not so strong in the chambers as in passing a narrow passage, and at these points the heavier particles will fall, aided by the deflectors, and thus save all the refuse that can be utilized as fuel, while the sound grain falls out of the drop-trunks and is spouted off. In this operation the suction-blast through the two opposite horizontal trunks meet, and descend alike the central section, while the different kinds of grain pass into the separate drop-trunks from the separate shakers and are cleaned. The intermediate drop-chambers are provided with weighted valves, which, opening automatically, under the weight of the collected feed-stuff, let it out and close again, to shut off air from entering at that point.

The blast of the fan is regulated in the opposite sections of the horizontal trunk to suit grain of different specific gravity, by means of slides placed in the drop-sections above the entrance of the grain therein.

In cleaning wheat and corn, the draft for the latter must be greater than that of the wheat, and the suction is increased by opening the slides in that side more than those of the other side, and so distribute the suction as to draw from each kind of grain with a force adapted to its specific gravity, and this regulation is effected in a blast drawn from a central point through two independent suction and cleaning drop-trunks.

In the accompanying drawings, Figure 1 represents an elevation of a grain-cleaning machine embracing my invention, the separators or shakers being shown in section; Fig. 2, a vertical section through the double-blast trunks and their suction-fans; Fig. 3 an end elevation, and Fig. 4 a top view.

The suction fan-case A is mounted horizontally upon a suitable frame, B, and the fan C is carried and driven by a vertical shaft, D, suitably stepped in bearings above and below the fan-case, and provided with a driving-pulley. To one side of the fan-shaft D a blast-trunk, E, communicates with and rises from the fan-case a suitable distance, and, joining a horizontal trunk of two equidistant branches, F F<sup>2</sup>, terminate in open drop-trunks G G<sup>2</sup>, de-



pending a suitable distance therefrom, forming the letter T, and constituting, with the fan-case, a grain-receiving and suction cleaning-trunk, of sufficient area to admit only of a properly-regulated suction-draft, which, meeting from opposite directions, descends to the fan-case and passes therefrom through a trunk-outlet, H, at the side.

Two oppositely-arranged separators or shakers, I I<sup>2</sup>, are suitable supported at the side of the trunk-branches F F<sup>2</sup> in positions to bring their delivering ends vertically coincident with the drop-trunks G G<sup>2</sup>, to deliver the separated grain therein to be cleaned, while the larger refuse passes off from the screens. For this purpose the separators incline in opposite directions, and have closed bottoms a, which terminate in inclined cross-chutes b, and from which the grain passes into spouts J J<sup>2</sup> at the sides of and into the drop-trunks, passing out through the ascending air-currents therein. The separators are operated by crank-shafts K K<sup>2</sup> supported upon the drop-trunks, and driven by belts L L<sup>2</sup> from a pulley, c, on the upper end of the fan-shaft. The T-branches of the suction-trunk are provided with V-shaped closed drop-chambers M, located between the drop-trunks and the junction of the branches with the fan-case section E, and within these chambers deflectors N extend from the top just over the deepest part of the chambers, and direct in the path of the current from the drop-trunks, so that all the particles drawn up from the descending grain through the drop-trunks will strike the deflectors and be turned downward, and the heavier matters will be precipitated to the bottom of the chambers, while the lighter matters pass on beneath the deflectors to the central section, and into and out of the fan corn-case. These chambers are provided with weighted valves P P<sup>2</sup>, pivoted to the angular side, so as to open under the weight of the matter and let it pass out, and close again by the action of a weighted arm, d, extending from the pivot of the valve. These cleanings are used as food, and the diminished strength of the draft within the chambers, by reason of their increased area, aids the collection of the heavier cleanings within the chambers.

In cleaning two kinds of grain, such as

wheat and corn, the draft must be regulated to suit the difference in the weight of each. As both streams of grain are cleaned by suction from the same fan, and as the suction into and through the opposite branches of the grain-cleaning trunk converge to and descend the central trunk, I am enabled to regulate the draft through each drop-trunk to the required force by increasing the draft in the corn-cleaning section and lessening that in the wheat-cleaning part. This I effect by means of slide-valves Q fitted in the central and two outside drop-trunks. By drawing the slides out more or less the force of the draft in one drop-trunk can be made greater than that in the other, or they may be made uniform in cleaning the same kind of grain from both the separators.

I claim—

1. The combination, in a grain-cleaning machine, of a grain-cleaning trunk of two opposite open drop-trunks, G G<sup>2</sup>, and a central section, E, with a suction-fan, C, and two oppositely-inclined separators, I I<sup>2</sup>, from which the grain passes into the drop-trunks G G<sup>2</sup>, whereby different kinds of grain may be cleaned at the same time and by the same blast within and through the opposite trunks.

2. The combination, in a grain-cleaning machine, having the opposite open drop-trunks G G<sup>2</sup>, central suction-trunk E, suction-fan C, and oppositely-inclined separators I I<sup>2</sup> of the intermediate closed drop-chambers M, provided with pendent deflectors N and valves P P<sup>2</sup>, substantially as and for the purpose set forth.

3. The combination, with the oppositely-inclined separators I I<sup>2</sup>, outer and central trunk-sections G G<sup>2</sup> and E, and suction-fan C, of the slides Q Q Q, whereby the suction-currents in the outer trunk-sections may be regulated either together or independently of each other, substantially as herein set forth.

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

DANIEL H. CASWELL.

Witnesses:

ED. S. FISHER,  
H. A. MACEY.