

(No Model.)

L. V. RATHBUN.
DUST COLLECTOR.

2 Sheets—Sheet 1.

No. 496,897.

Patented May 9, 1893.

Fig. 2.

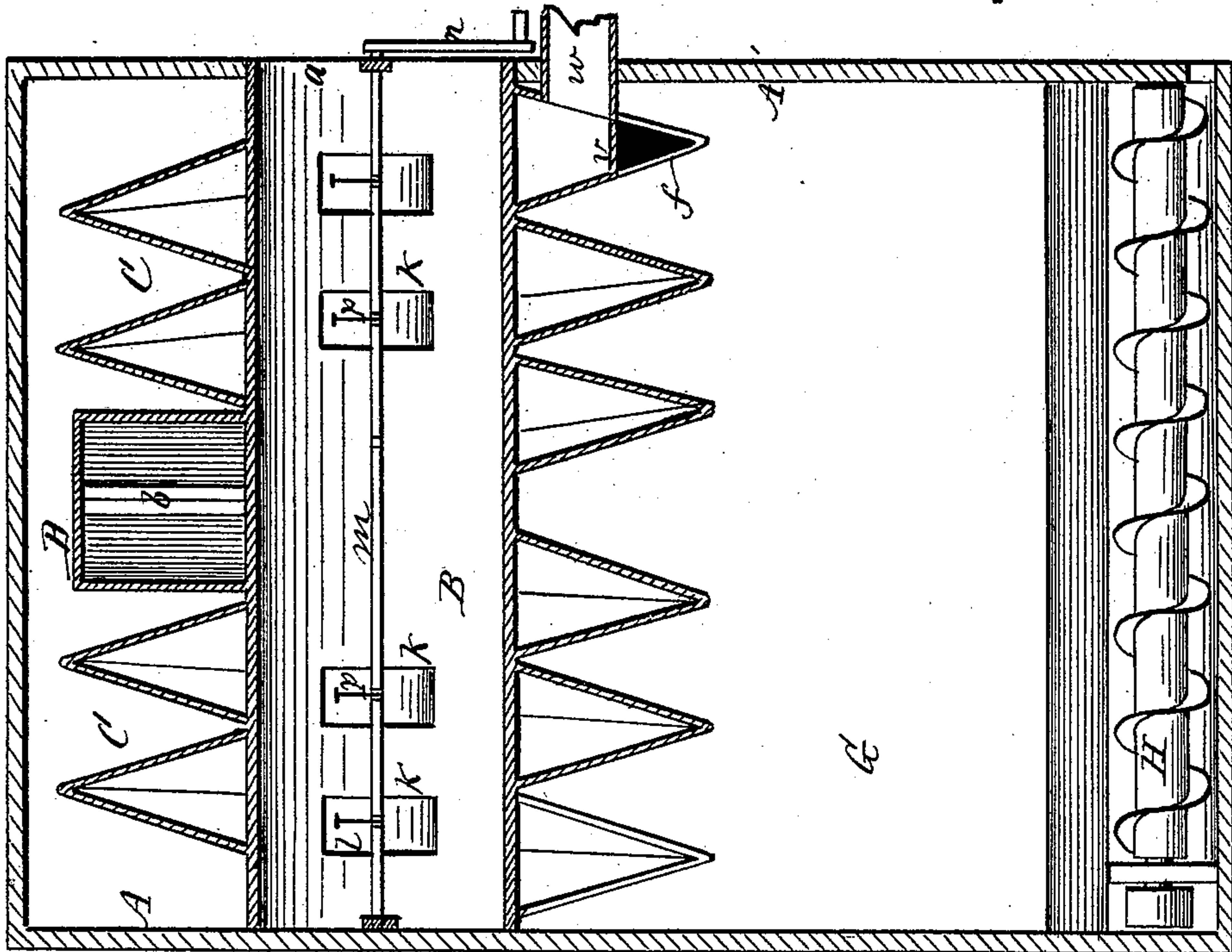
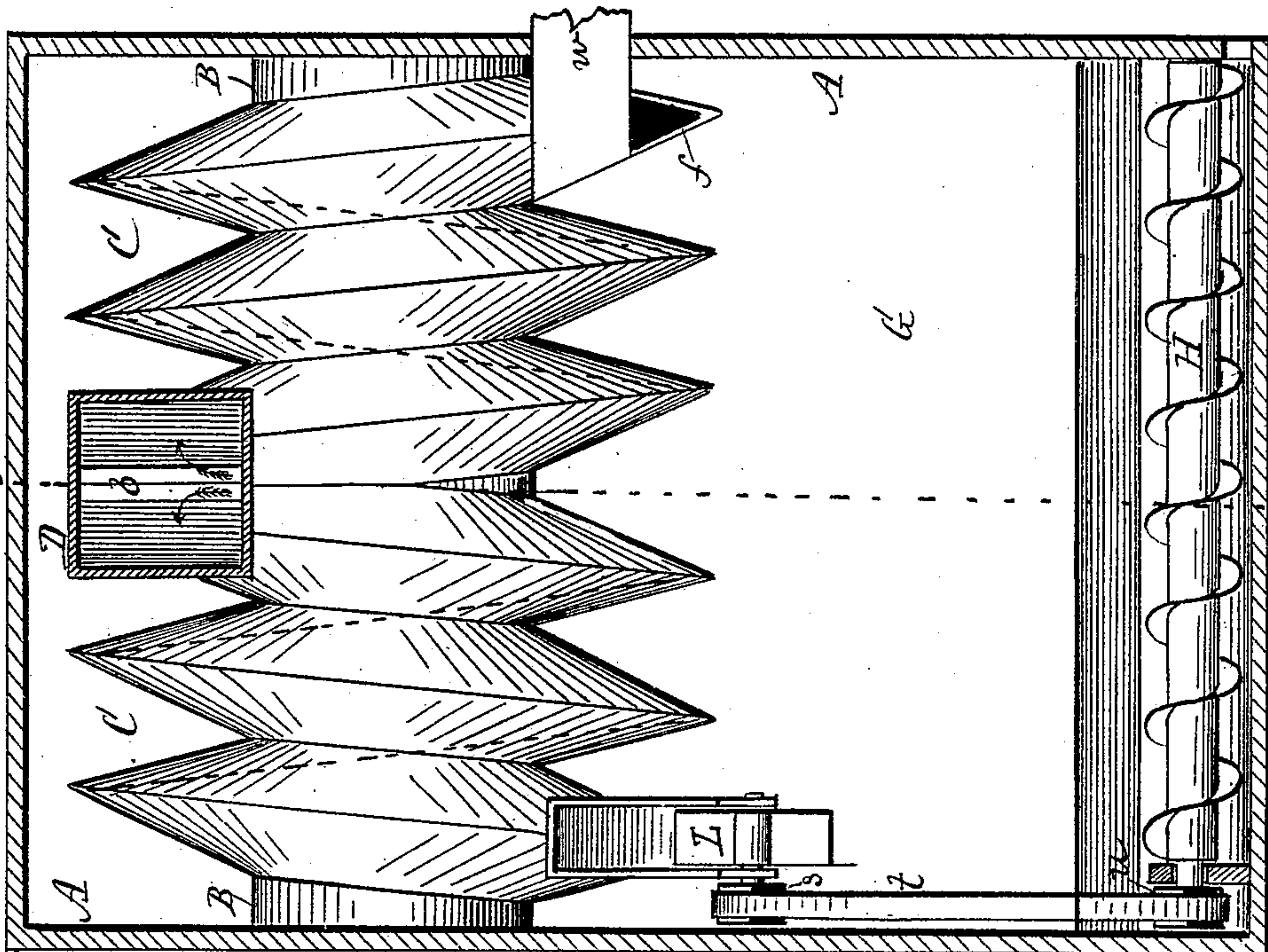


Fig. 1.



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Fig. 4.

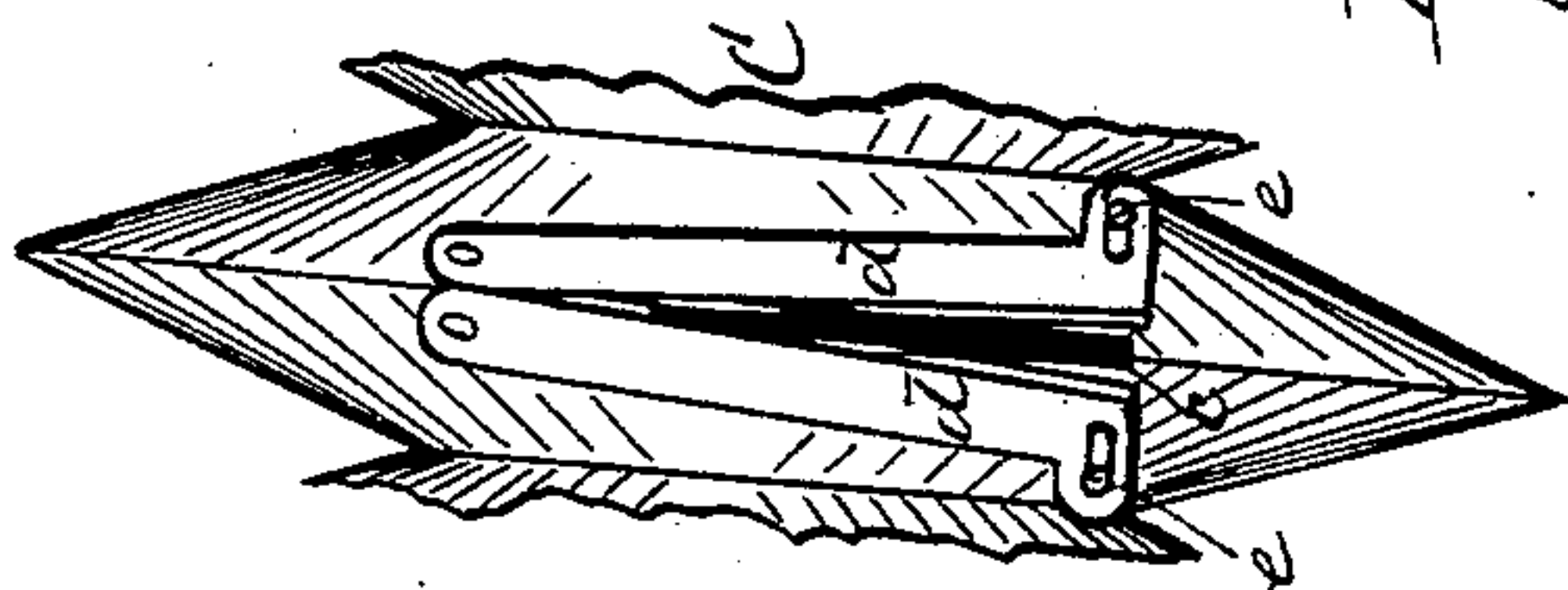


Fig. 6.

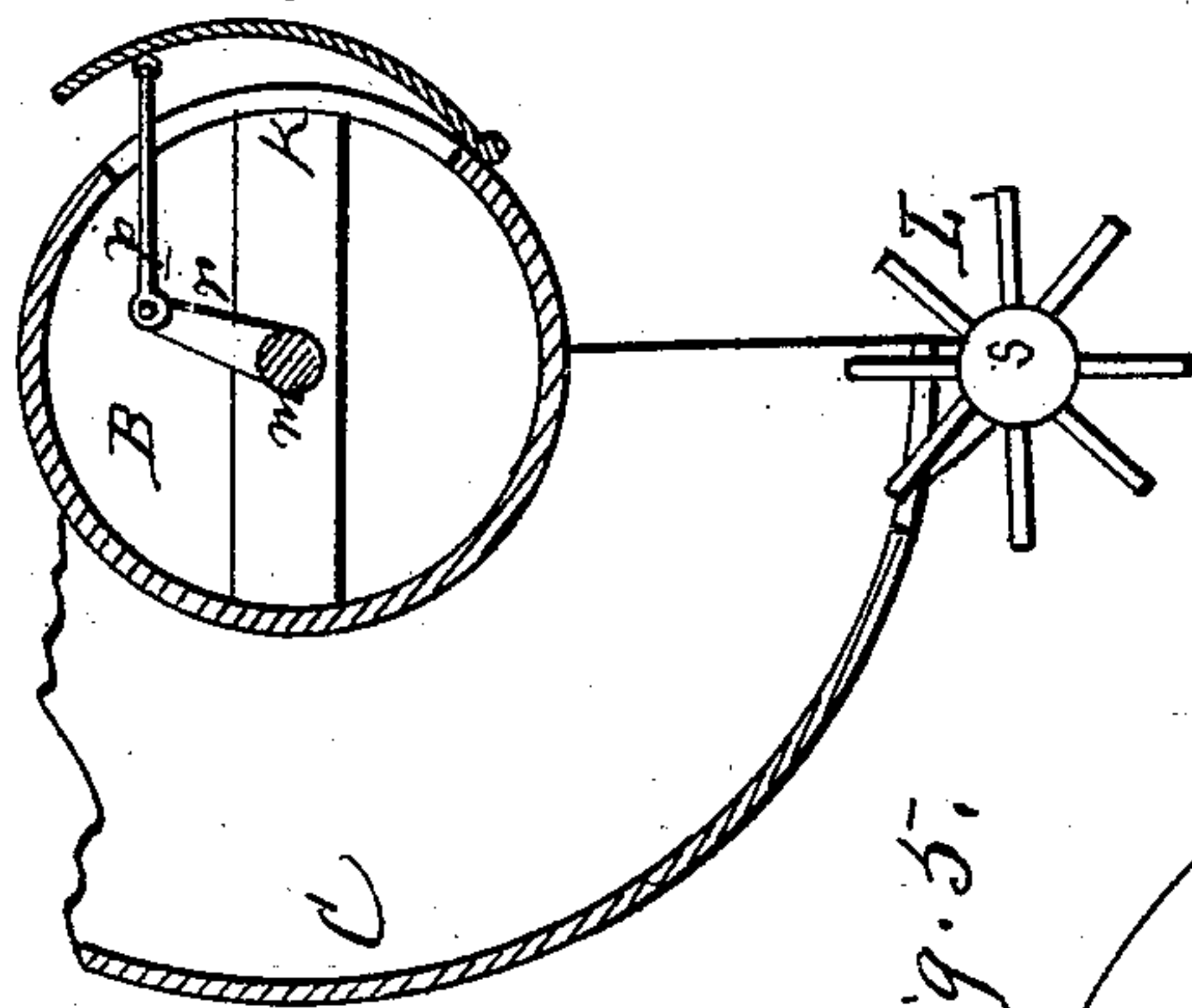


Fig. 5.

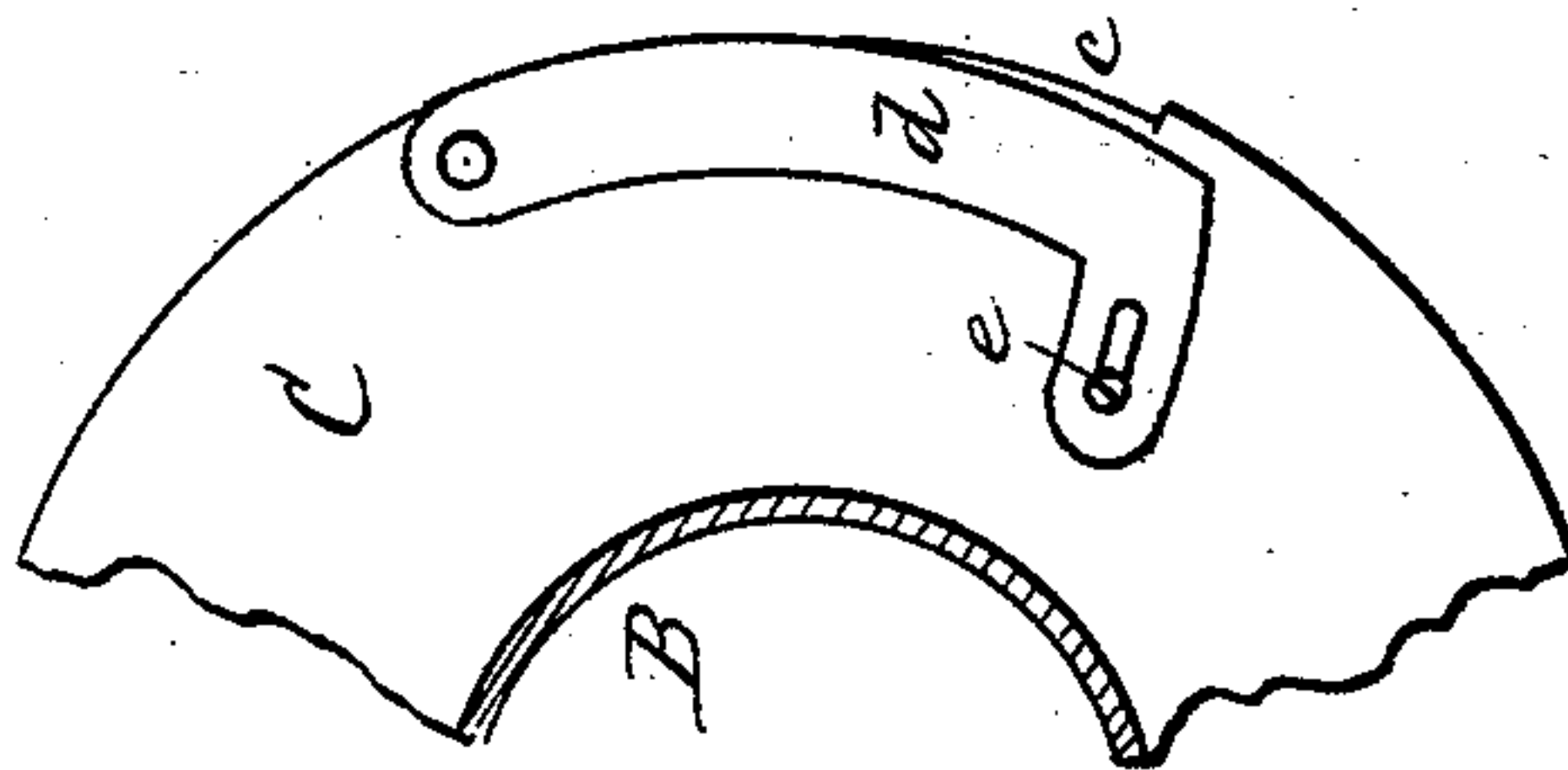
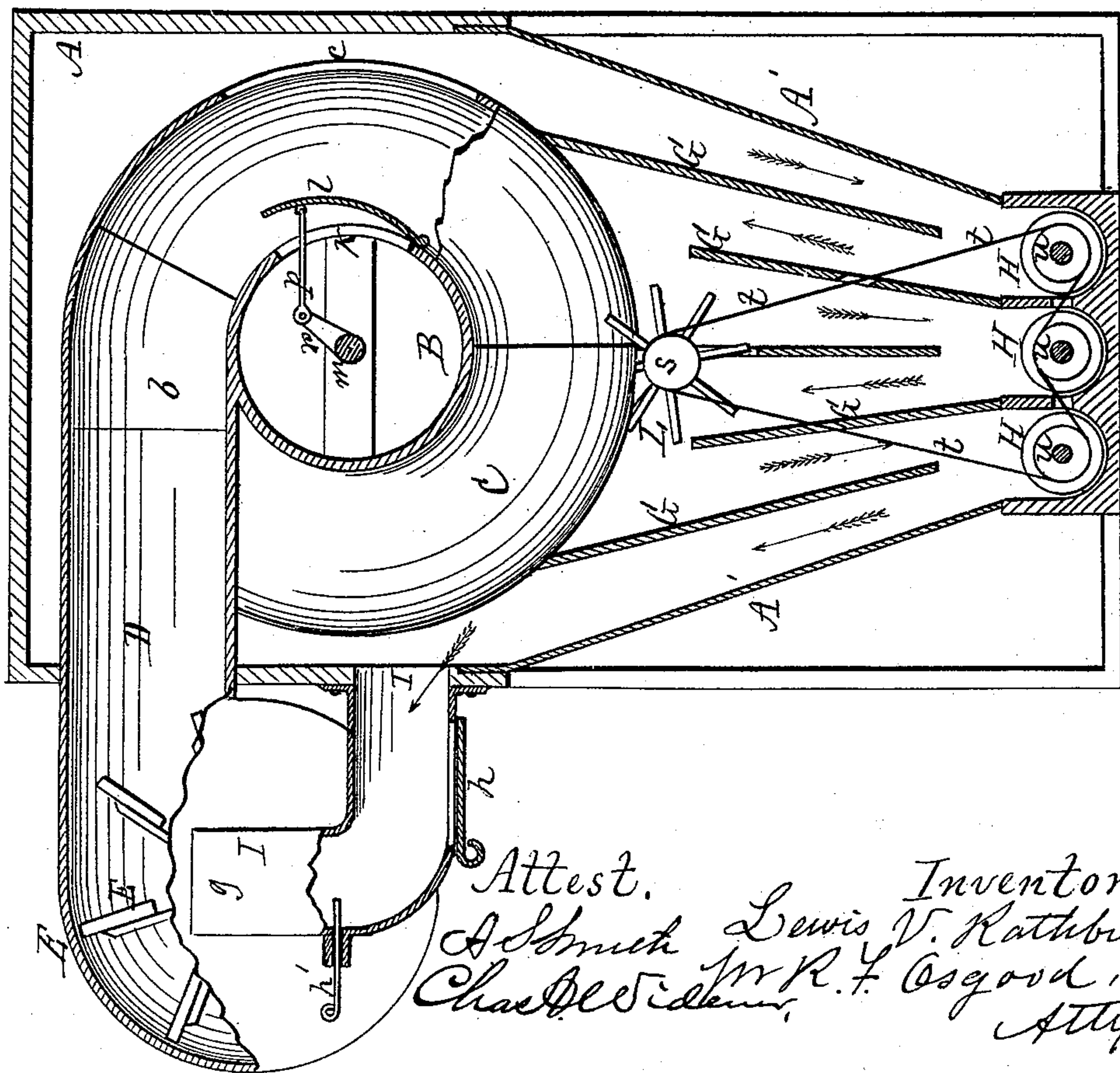


Fig. 3.



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UNITED STATES PATENT OFFICE.

LEWIS V. RATHBUN, OF ROCHESTER, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MARY E. RATHBUN, OF SAME PLACE.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 496,897, dated May 9, 1893.

Application filed June 4, 1888. Serial No. 275,928. (No model.)

To all whom it may concern:

Be it known that I, LEWIS V. RATHBUN, of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Dust-Collectors; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the drawings accompanying this specification.

My improvement relates to dust collectors, in which a blast of air is forced through a spiral trunk of V-shape in cross section, the centrifugal action of the current carrying the dust to the outer angle or apex of the trunk and discharging it as it is carried around.

The invention consists in the construction and arrangement of parts hereinafter more fully described and definitely claimed.

In the drawings—Figure 1 is a vertical section of the inclosing case and a side elevation of the dust collector. Fig. 2 is a central, longitudinal, vertical section of the apparatus. Fig. 3 is a vertical cross section in line $x x$ of Fig. 1. Fig. 4 is a front elevation of a portion of one of the spiral trunks showing the slot therein for the discharge of the dust, and the valve for opening and closing the slot. Fig. 5 is a side elevation of Fig. 4. Fig. 6 is a sectional view of one of the trunks of the scroll showing the wind wheel or fan for running the conveyers.

A shows the exterior inclosing case, which may be of any desired form, but the bottom portion, A' , is preferably inclined at the sides, as shown in Fig. 3, in order to allow the dust to pass down without gathering or clogging.

B is a cylinder extending across the case, the same being open at one or both ends, as shown at a .

C C are two trunks forming air passages, extending spirally around the cylinder B, in the same manner that the thread does around a screw. These trunks, where two are used, start from the center and extend in reverse directions as shown in Fig. 1. But if desired only a single trunk may be used extending in only one direction.

D is the air spout, extending from the fan case E and opening into the spiral trunk or trunks at the top. In case two reverse trunks are used, this spout opens into them at their

junction, and is provided at that point with a divider b , which divides the blast and turns a part of it into one trunk and a part into the other. The trunk C is V shaped in cross section, the apex being at the outer edge, and as the blast is forced through the trunk the tendency is for the dust to pass to the outer angle by reason of the centrifugal action. The dust is carried around in this angle by the force of the current and finally discharged.

c (Figs. 3, 4 and 5) is a slot formed in one or more of the turns of the trunk, preferably on the side at right angles to the entrance of the air spout, for the purpose of discharging the dust at that point. This slot is covered by a valve by which the slot can be opened or closed more or less to grade it to the proper discharge of the dust. The valve shown consists of two half valves $d d$ pivoted at their upper ends to the sides of the trunk and turning in and out to open or close the slot, being fixed at any adjustment by set screws $e e$ at the bottom. These half valves are so located that they commence to close first at the top, and then close gradually downward, thereby contracting the size of the slot both in its length and width. In addition to these slots for the discharge of the dust the outer extremity of the trunk is open as shown at f .

G G are a series of partitions in the lower part, A' , of the case, alternately open at top and bottom, forming a zigzag passage through the case. The air which escapes from slots c passes down, then up, then down again, then up again, till the end of the passage is reached. The dust is deposited at the bottom in the several pockets in grades, and at the end the air is comparatively free of dust. After passing the last partition the air passes through a spout I which connects the lower part of the case with the fan case E. By this means the air, which has already been passed through the machine, can be passed through again and again, thereby removing all dust that remains therein. The spout I has slides $h h'$, the latter arranged to cross the passage of the spout, and by opening one and closing the other the exhaust air can be cut off from the fan and discharged into the outer air.

K K are one or more openings made through the cylinder B, communicating with the in-

terior of the trunk C, and *l l* are one or more hinged valves covering these openings.

m is a shaft extending longitudinally through the cylinder and operated by a crank *n*, at the outer end.

r r are crank arms attached to the shaft, and *p p* are links connecting the crank arms with the valves. By turning the shaft the valves can be opened or closed. By opening the valves a portion of the air that circulates through the trunk is drawn into the cylinder and discharged at its outer end outside the case. The air drawn into the cylinder is the inner strata of that in the trunk and is comparatively pure or free of dust. This arrangement serves to grade the intensity of the blast and adapt it to the conditions under which the machine is used. Where the dust is very heavy, or in large volume, the valves can be closed so that all the air will pass through the trunk to drive the dust out. When it is very light, or in small amount, a large portion of the air can be drawn out through the cylinder which may be open at both ends. The valves *l* stand with their swinging sides upward, in the direction reverse to the current, by which means they not only serve to grade the opening of the slots *k*, but also act as deflectors to catch the air and direct it inward through the slots.

L is a wind wheel located in one of the discharge ends *f* of the trunk C, so as to take the force of the blast at the outer edge.

s is a pulley on the shaft of the wind wheel, and *t* is a band that extends downward and passes around pulleys *u u u* on the shaft of the conveyers H, H, H. The blast from the trunk C is sufficient to operate the conveyers through the medium of the wind wheel and band as above described. At the other discharge end *f* of the trunk C is a partition *v* forming two passages at said discharge end, the dust passing out through the lower angular passage into the case A while the purer air passes from the upper passage through a spout *w* to the outside of the case.

Having described my invention I do not claim simply and broadly a spiral passage through which the dust-laden air is driven, with slats therein for the passage of the air. Neither do I claim a double V-shaped chamber with discharge openings at the ends.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a dust collector, the combination with a hollow cylinder, open at one or both ends and provided with a tangential inlet spout

of a hollow trunk with spiral convolutions V shaped in cross section surrounding the cylinder, provided with slots at the apex for the discharge of dust, and with an open outer end for the discharge of the blast, as herein shown and described.

2. In a dust collector, the combination, with a hollow cylinder, open at one or both ends and hollow trunks with spiral convolutions extending in reverse directions, around said cylinder and provided with open outer ends for the discharge of the blast, of a blast tube opening into the trunks at their junction, and a dividing block in the blast tube for separating the blast and causing a portion to enter each trunk, as herein shown and described.

3. In a dust collector, the combination, with a hollow cylinder open at one or both ends, having a tangential inlet spout, and provided with valve openings in its body, and with a spiral hollow trunk surrounding the cylinder and inclosing the openings, of valves hinged to the cylinder and covering the openings, the swinging sides being opposed to the current passing through the trunk, whereby said valves act as deflectors to carry a part of the current into the trunk, as herein shown and described.

4. The combination, with the hollow cylinder B open at one or both ends and provided with a tangential inlet spout, and hollow trunk C, of the valve *l*, the shaft *m*, crank arm *r* and link *p*, as and for the purpose specified.

5. In a dust collector, the combination, with the trunk C, and conveyer H, of the wind wheel L located in the discharge end of the trunk, and a band *t* passing around pulleys of the wind wheel and conveyer shafts, for the purpose of giving motion to the conveyer, as herein shown and described.

6. In a dust collector, the combination of the inclosing casing A, the hollow cylinder B, located therein, the hollow spiral trunk C surrounding the cylinder and provided with slots *c* in its periphery, the fan case E, the spout D connecting the fan case with the trunk, the spout I connecting the fan case with the inclosing casing, and the slides *h h'* in the spout I, as shown and described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

LEWIS V. RATHBUN.

Witnesses:

R. F. OSGOOD,
P. A. COSTICK.