

(No Model.)

3 Sheets—Sheet 1.

G. H. RECTOR.

DUST COLLECTOR.

No. 308,628.

Patented Dec. 2, 1884.

Fig. 1.

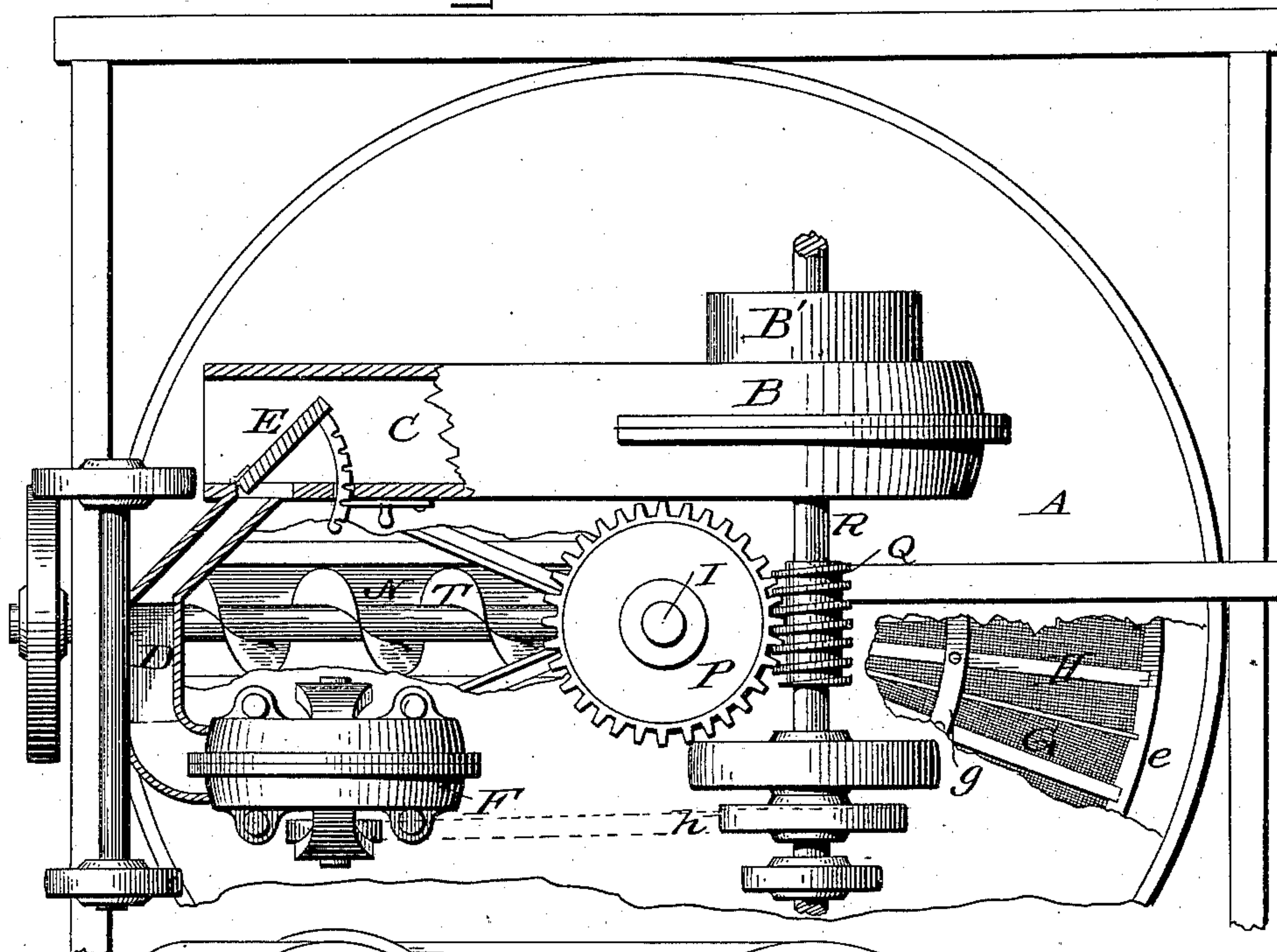
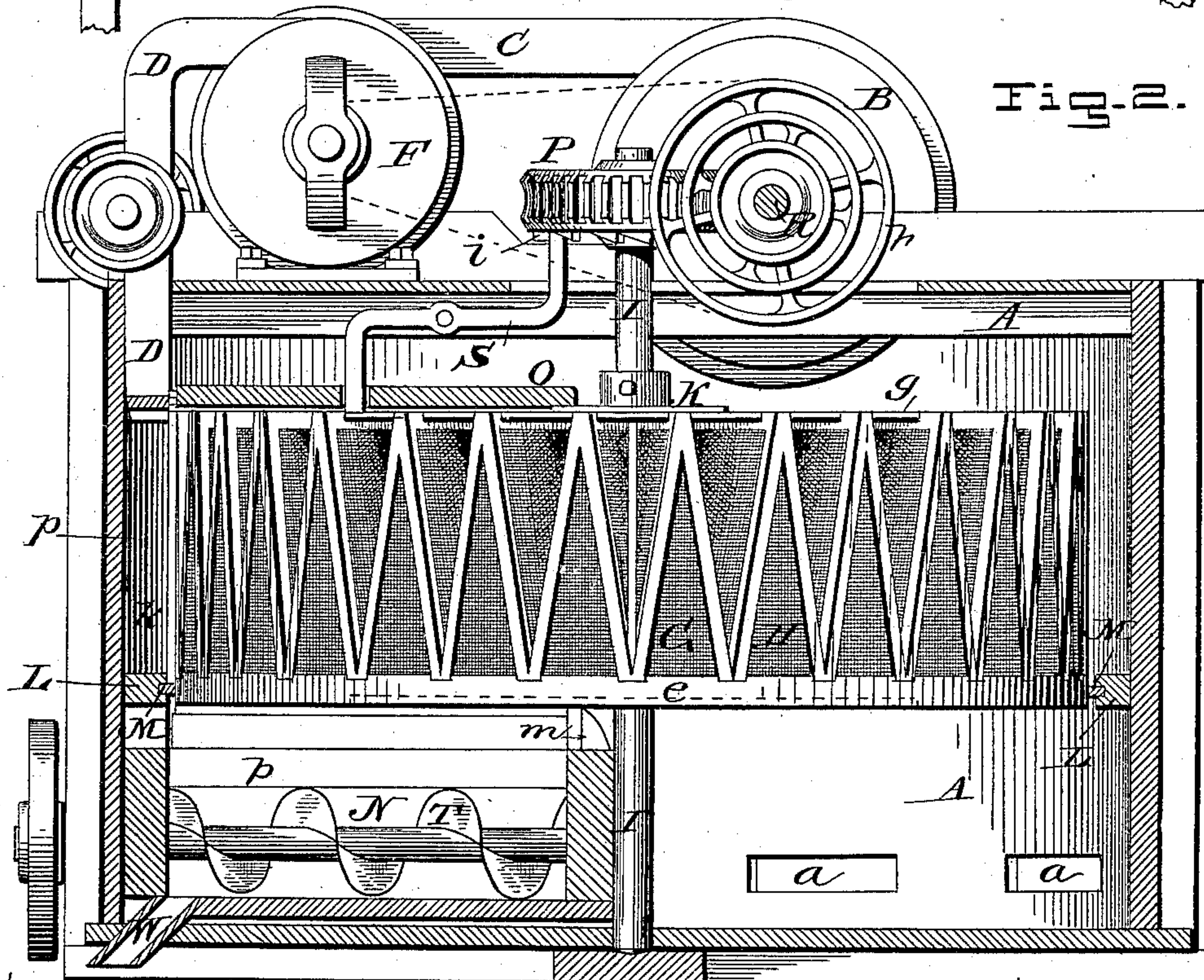


Fig. 2.



WITNESSES

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(No Model.)

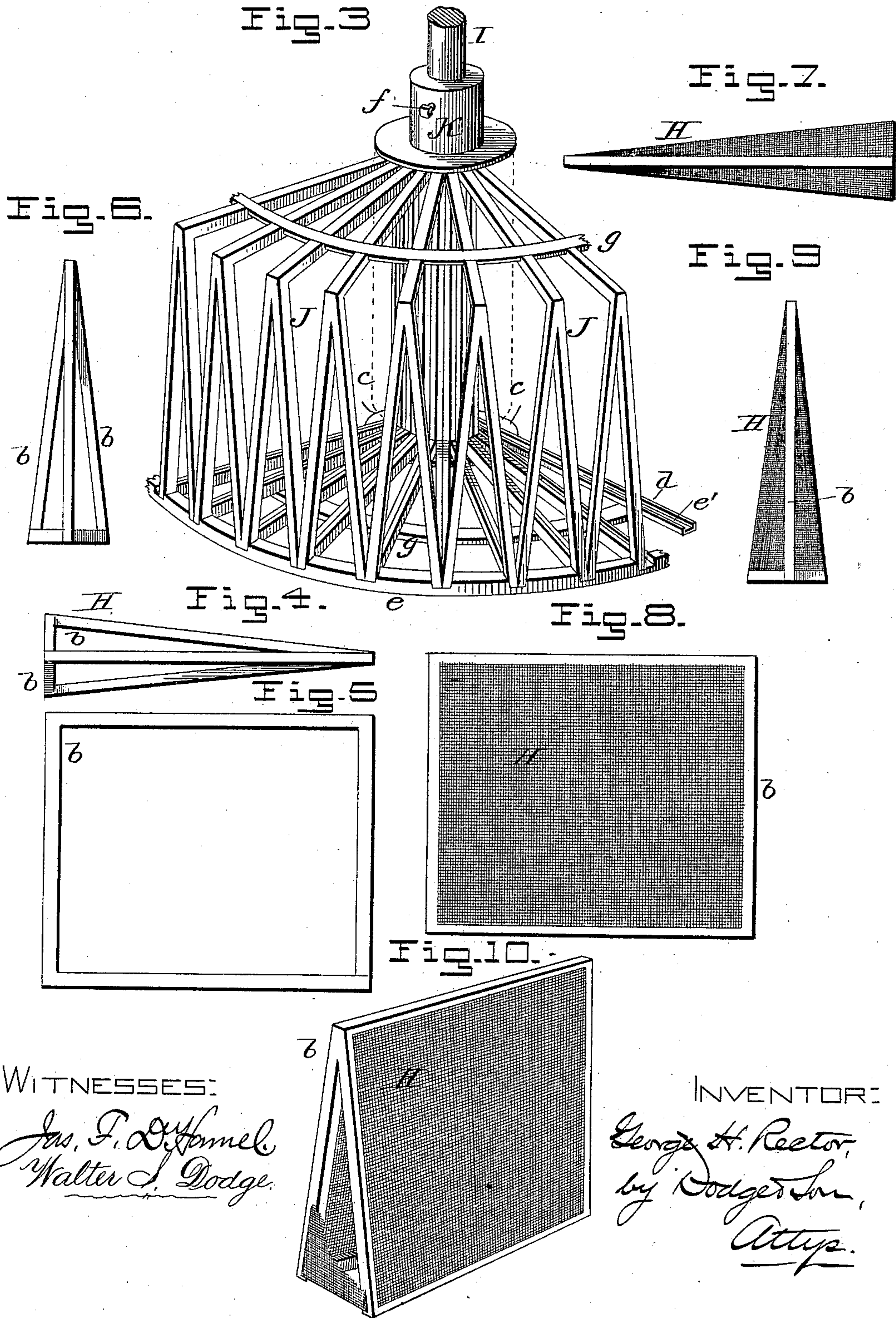
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3 Sheets—Sheet 3.

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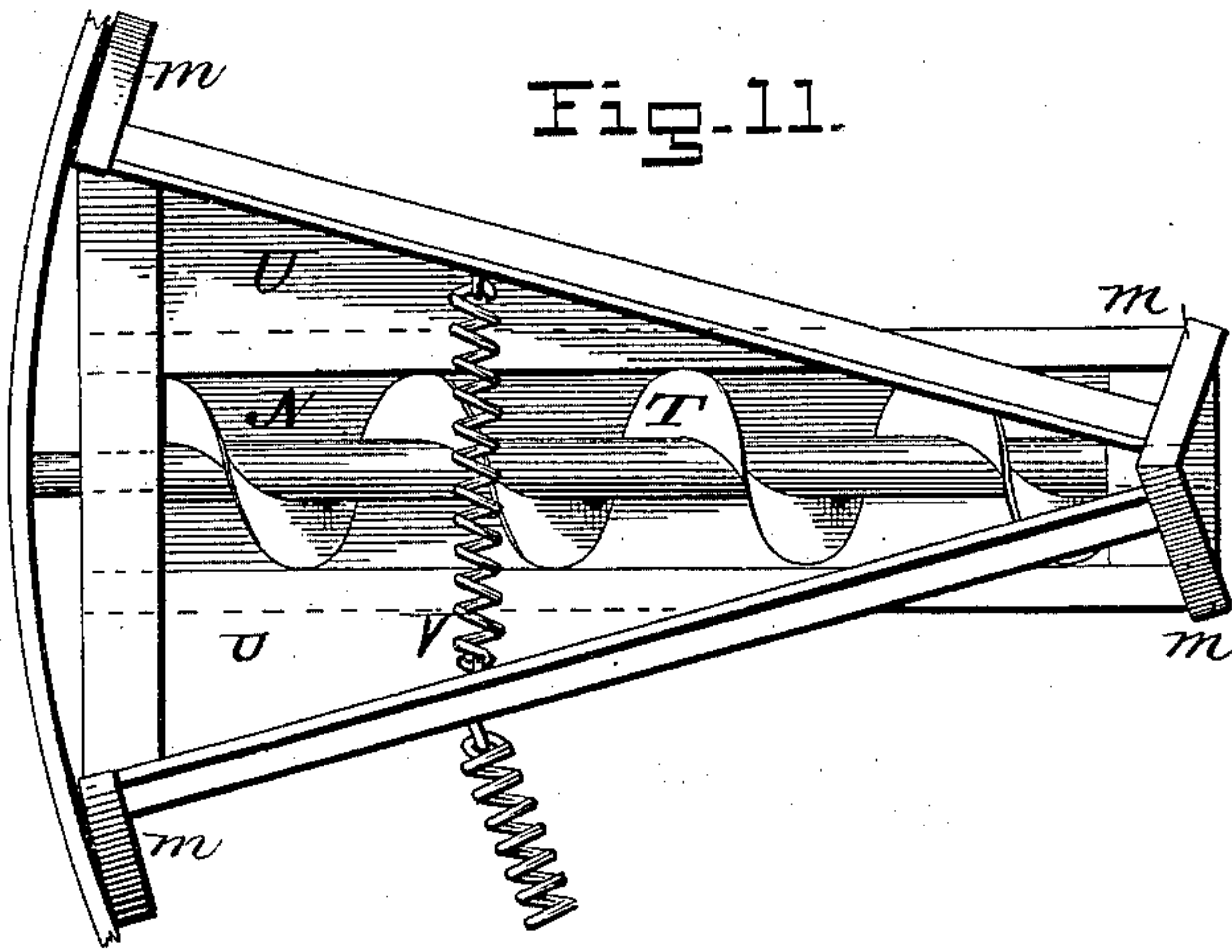


Fig. 11.

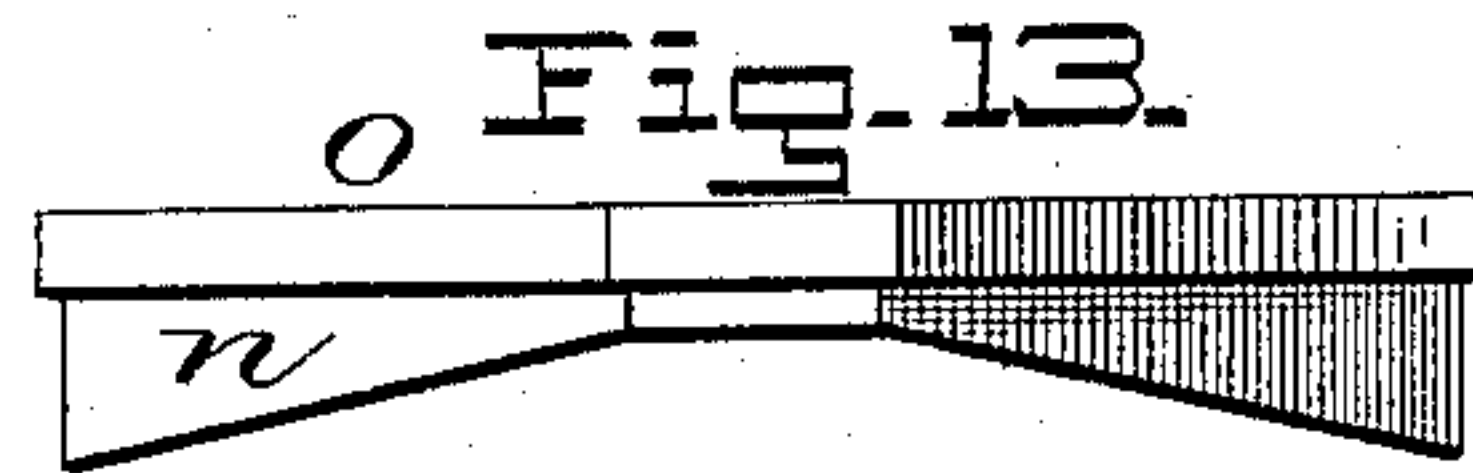


Fig. 13.

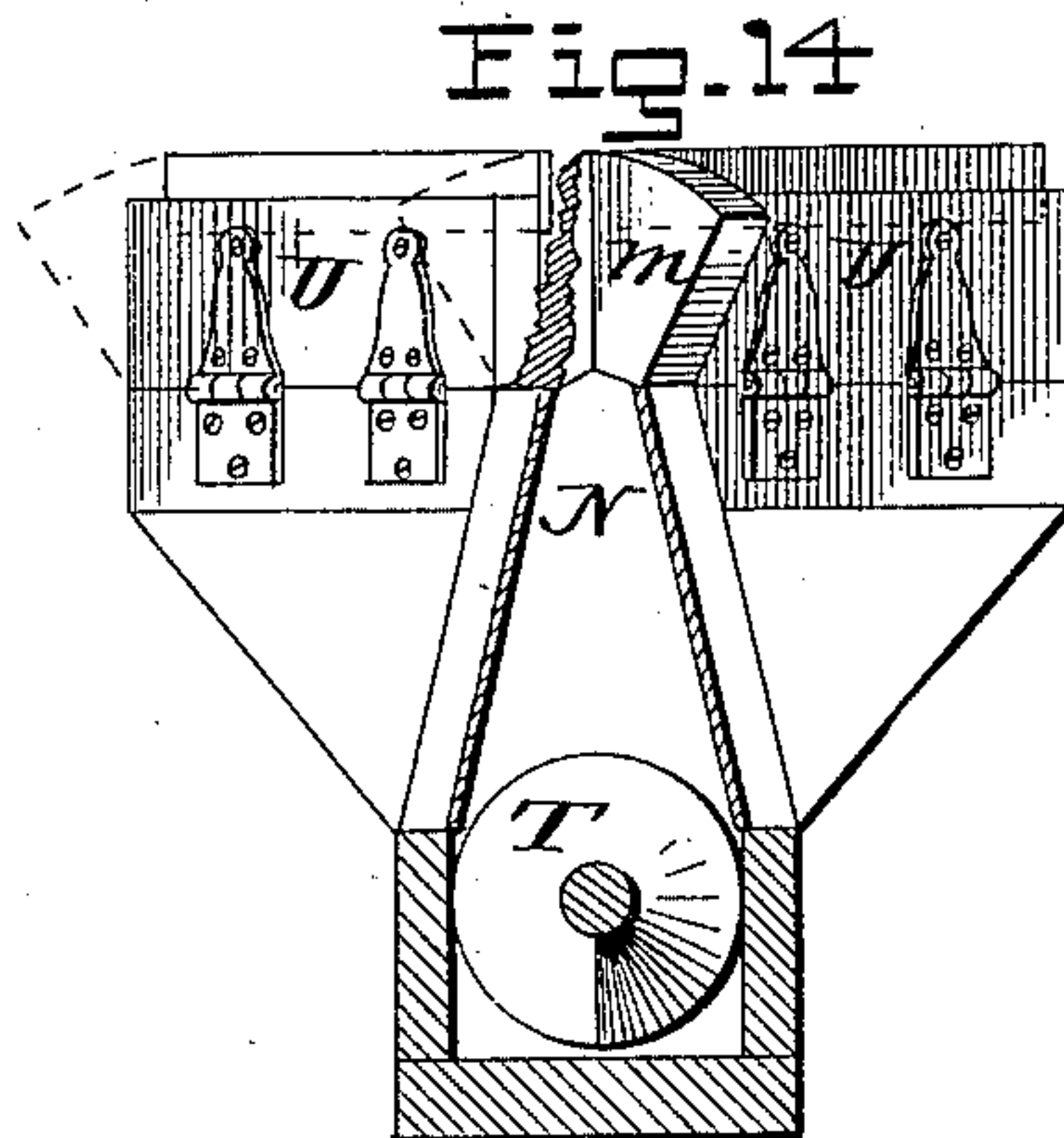


Fig. 14.

Fig. 12.

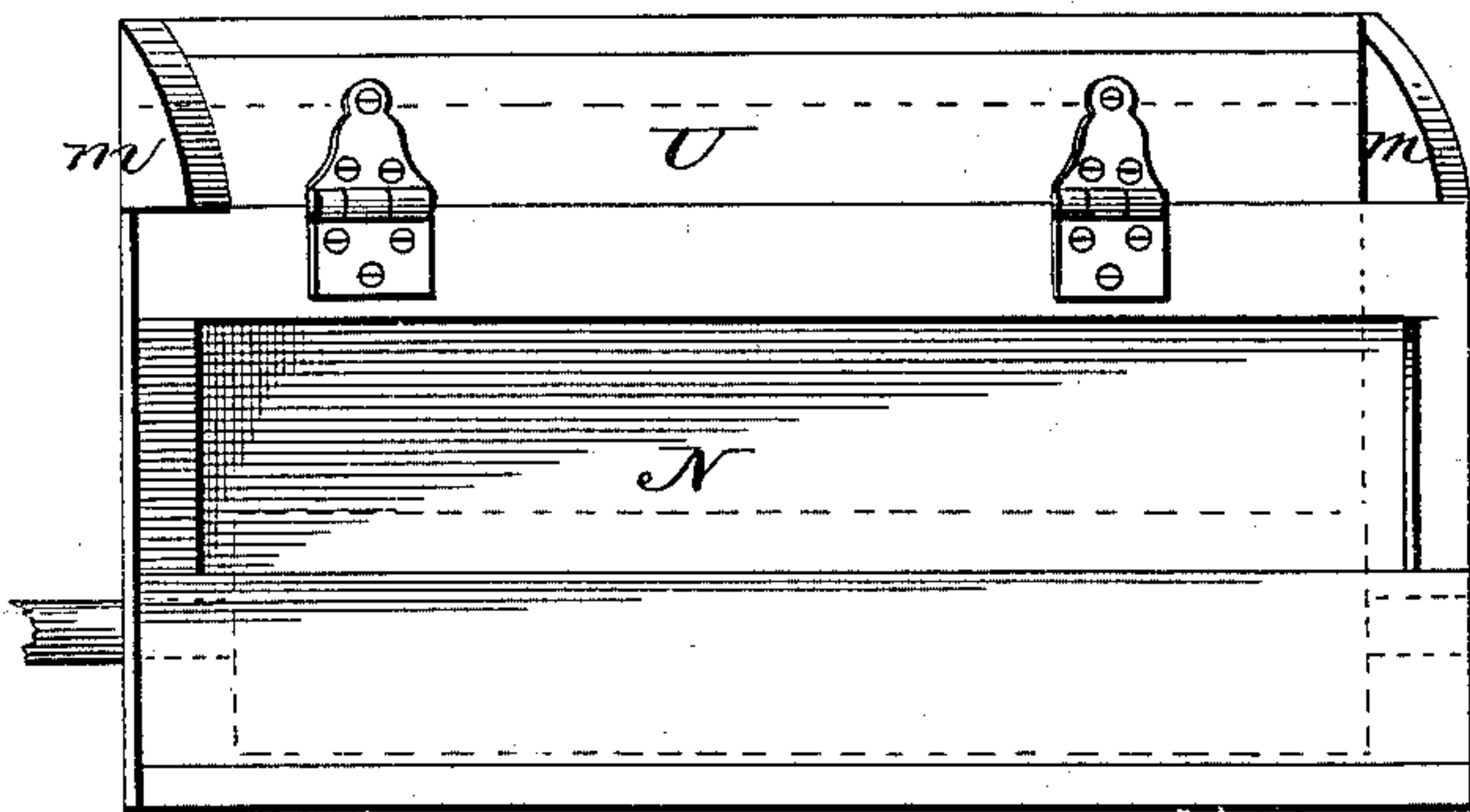


Fig. 18.

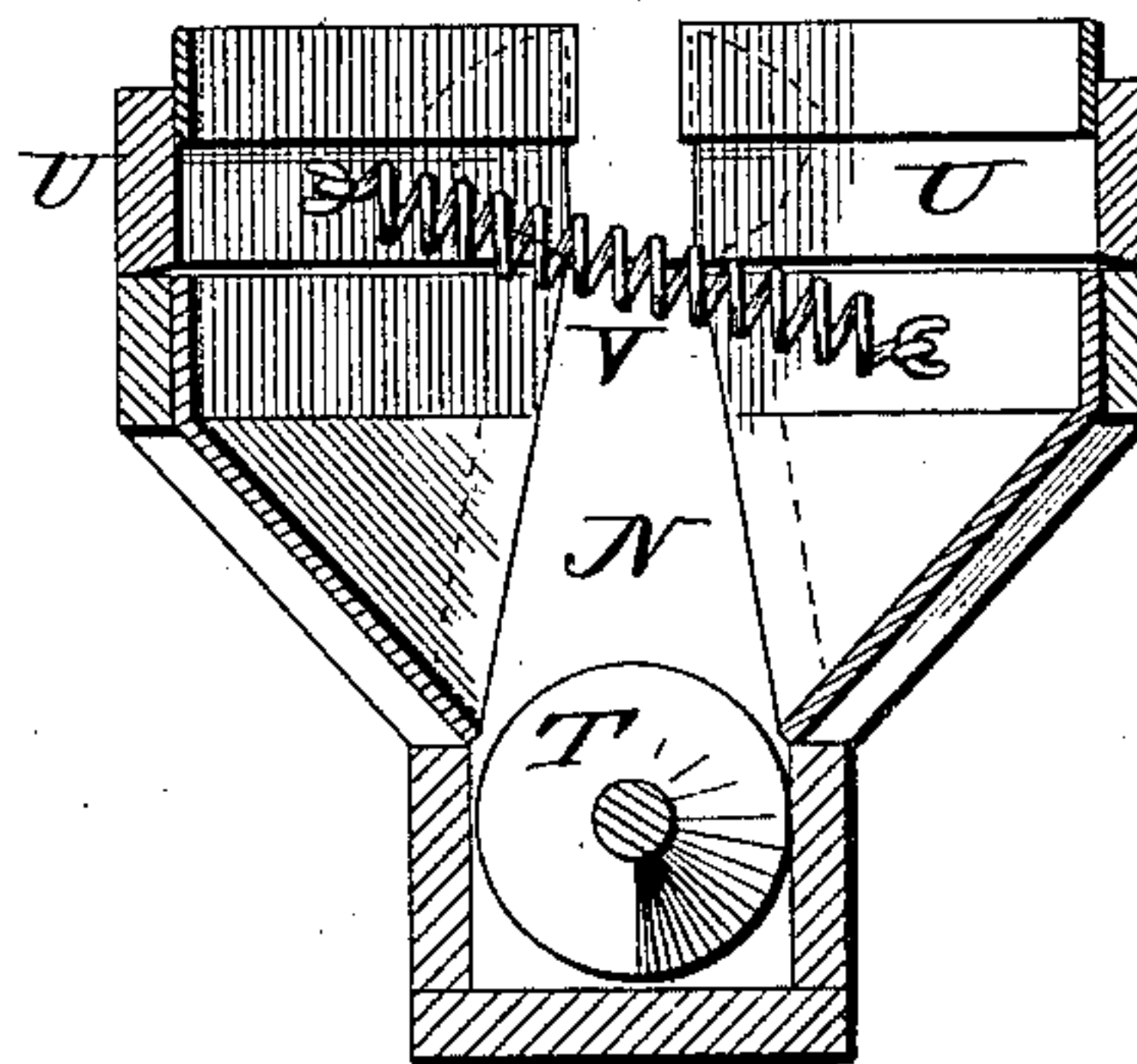


Fig. 15.

Fig. 16.

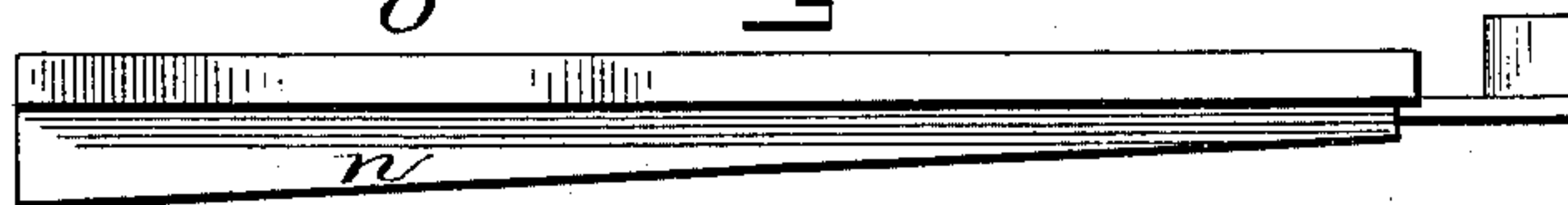
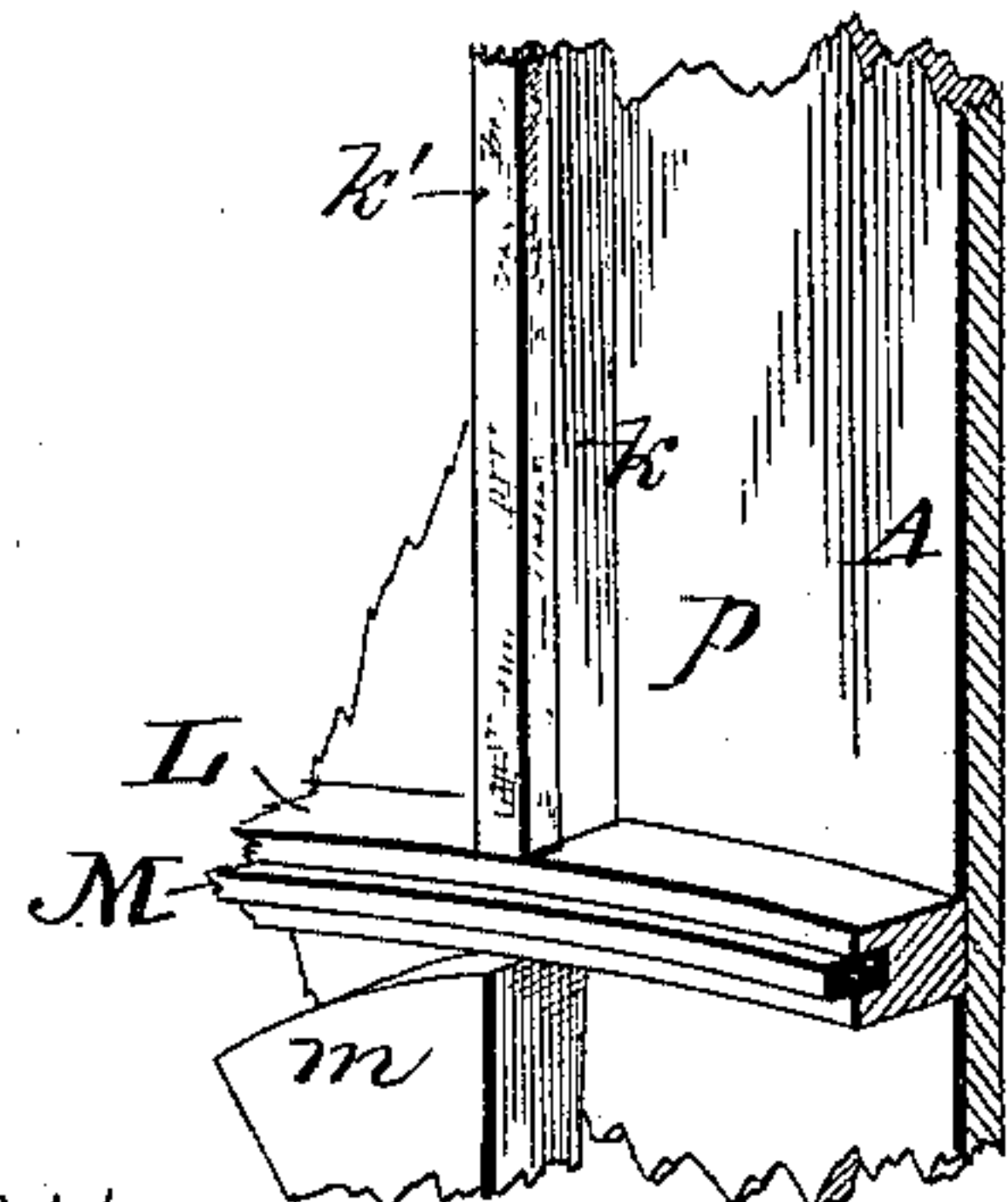


Fig. 17.



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UNITED STATES PATENT OFFICE.

GEORGE H. RECTOR, OF LA PORTE, INDIANA, ASSIGNOR OF ONE-HALF TO
WILLIAM H. BENNETT, OF CHICAGO, ILLINOIS.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 308,628, dated December 2, 1884.

Application filed February 1, 1884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. RECTOR, of La Porte, in the county of La Porte and State of Indiana, have invented certain Improvements in Dust-Collectors, of which the following is a specification.

My invention relates to that class of dust catchers or collectors in which a rotating cylinder or drum is employed to carry the screening material, and is made to travel through a dead-air chamber, to permit or facilitate the removal of adhering matter from said screening material.

The improvements consist in a novel construction of the drum, whereby a very extended screening-surface is secured within a small space, and in other features and details, hereinafter fully explained and claimed.

The accompanying drawings illustrate my invention embodied in a preferred form, though various modifications may be made without departing from the spirit of my invention.

Figure 1 is a top plan view of my improved machine, partly broken away to show the internal construction; Fig. 2, a side elevation of the same, showing the casing broken away and certain parts in section; Fig. 3, a perspective view of a part of the frame of the drum or wheel; Figs. 4, 5, and 6, top, side, and end views of the screen-frames before covering, Fig. 6 showing the inner end of the section; Figs. 7, 8, and 9, like views after covering; Figs. 10 to 18, inclusive, detail views of the various parts, hereinafter referred to and explained.

Hitherto star-shaped wheels or drums clothed with screening material and arranged to rotate within a casing containing a dead-air chamber, through which the wheel or drum travels, have been employed in machines of this class, in connection with means for drawing a current of air through the porous covering of the wheel or drum into the interior, and thence out at the end or head thereof, and with a hammer to jar the wheel and dislodge adhering matter. Such features, broadly considered, are hereby recognized as being old, and hence are not claimed.

In order to insure the proper purification of a large body of air without making the ma-

chine of undue size it is necessary to multiply as much as possible the surface of the screening material within a given space, and this I accomplish in a manner which I will now explain.

Referring again to the drawings, A indicates an upright cylindrical casing closed at the top and bottom, but provided with openings *a* in its sides near the bottom to admit air, which is drawn upward through the case by means of a fan, B, at the top of the casing through a trunk opening into casing A, and into the fan-casing at or near the center of the latter, and discharged through a spout, C, directly into the atmosphere, or passed wholly or partly down a spout, D, for a purpose presently explained. A valve, E, serves to direct more or less of the air into spout D, or to open the spout C to discharge directly into the atmosphere.

F indicates a second fan, which takes air from the atmosphere and forces it through spout or trunk D, either in connection with or independently of a current from fan B.

G indicates a rotary drum or wheel composed of a series of sections, H, each consisting of two rectangular frames, *b*, joined along their upper edges and at their inner ends, but spread apart at their outer ends in inverted form, so that a space is left between the two frames of segmental form longitudinally and of A shape vertically, as will be more readily understood upon referring to Figs. 1 to 10, Figs. 4 and 7 showing a top plan view of a section, Figs. 5 and 8 a side view of the same, Figs. 6 and 9 an inner end view, and Fig. 10 a perspective view of a complete section. The sides and open or wider end of each frame or section are covered with flannel, gauze, or other suitable pervious material. As a consequence of this construction I secure far more surface than is attainable with the ordinary star-shaped drum, first, because a larger number of frames can be used, and, second, because each frame presents double the surface of the ordinary star-wheel sections, beside the portion at the end of the section. Each frame *b* has its inner end arranged parallel with the axis of a central shaft, I, which supports and carries the wheel or drum;

but its outer end being inclined as explained, it of course follows that a slight twist or wind is given to the frame, so slight, however, as to offer no difficulty in manufacture and cause
5 no considerable or injurious strain upon the frame.

J represents a wheel or skeleton platform secured rigidly to the central shaft, I, and composed of a metal disk, *c*, having radial
10 arms which support the wooden spokes *d*, the spokes being bolted or otherwise firmly attached thereto and stayed and kept in proper relation by a circular hoop or band, *e*, forming the circumference of the wheel or platform,
15 as shown in Fig. 3. The spokes or arms *d* have their upper faces provided with grooves *e'*, to receive the lower edges of screen-frames *b*, which may be inserted either in their connected form as completed sections H or separately, in which latter case their upper edges
20 will be subsequently drawn together and united. Each spoke or arm *d* receives the lower side of two frames, *d*, as shown in Fig. 3, retaining them in close contact, and properly
25 holding apart the two frames of each section at the lower side. In this way the lower edges of adjoining sections are closely united in the same manner as the upper edges of the two
30 frames of each separate section. The sections, or the individual frames thereof, are pressed and held down to their seats in the arms by a circular plate or disk, K, provided with a hub or sleeve, which encircles
35 and slides freely upon shaft I, except when made fast thereto by means of a set-screw, *f*, with which it is furnished, or by equivalent means, and annular bands *g* serve to tie the sections together and retain each in proper relation to the others.

L indicates an annular ledge or rib projecting inward from the inner wall of the casing A, and provided with a packing-strip, M, of felt, leather, rubber, cloth, or other material adapted to rest against the face of band or rim
45 *e* of wheel G, and to form an air-tight joint therewith, without producing wear or friction sufficient to interfere with the efficient operation of the machine. The wheel G is raised up somewhat from the bottom of casing A,
50 and beneath it is placed, within the casing, a depositing-chamber, N, of segmental form, and including about one-eighth of the circle of the casing ordinarily, hence covering about three or four sections, H, of the wheel at a
55 time. It will of course be understood, however, that the size and relative proportions of this chamber to the wheel and casing may be varied as required, the above being found advantageous in practice.

60 Above the wheel or drum G is placed a board or guard, O, corresponding in size and location with the chamber N, the board and the walls of said chamber preventing the upward passage of air through the meshes of those
65 screens which are for the time included within their limits, and thereby forming a dead-air

chamber, so that the matter adhering to the under sides of the screens may be readily jarred from them. The wheel or drum G is
70 rotated by gear-wheel P, which receives motion from a worm or screw, Q, on the shaft R of fan B, said shaft being furnished with a series of pulleys, *h*, by which motion may be imparted thereto, as required.

In order to jar the drum or wheel G to detach adhering matter therefrom, the under
75 side of wheel P is provided with a series of cams, *i*, which ride one after another over the upper arm of a bent lever or hammer, S, pivoted in a suitable support, and, passing off the
80 same, permit the hammer to descend through an opening in guard O and strike upon the annular hoop or band *g* at the upper side of the wheel directly over the chamber N. Since
85 there is no upward suction through the screens at that point the material is readily detached; but to make such detachment, and to clear and open the meshes of the screens more perfectly,
90 I close up the space between the casing and the drum or wheel G included between the walls of the chamber N by boards or plates, which are provided with padded faces, or with
95 yielding packing-strips, *k'*, to bear against the periphery of wheel G and produce a tight joint. I then extend the spout D into the
chamber *p* thus formed, so that the air from fan F and such part of the current from fan B as may be delivered into spout D shall enter
100 said chamber *p* and pass through the screening material of wheel G in a downward direction, or a direction opposite to that in which the air passes in the rest of the casing. In this way all particles not removed through
105 the jarring action of the hammer S are blown off by the blast through spout D.

The hammer S and the counter-blast of the fan or fans act only on that portion of the wheel or drum within the dead-air chamber, or over chamber N; hence the material detached falls directly into the same, whence it
110 is carried off by a conveyer, T, or in any equivalent manner.

In order to secure a close and air-tight joint between the walls and sides of the chamber N and the lower side of the wheel or drum G, I
115 provide said walls with hinged upper sections or valves, U, which are held up against the under side of the wheel or drum by springs V, as shown in Figs. 11 and 15, the upper
120 edges of said valves being provided with strips of felt, rubber, leather, or like yielding material, bearing against the face of the wheel and effecting a close joint. The inner and outer
125 ends of the hinged valves U work against quadrant-shaped boards *m*, which prevent the entrance or exit of air or dust at those points, as shown in Figs. 2, 11, 12, 14, and 18. For
130 a like purpose the guard or board O is furnished with a depending curtain, *n*, which may be of sheet-rubber, canvas, or any other suitable material, as shown in Figs. 17 and 18. The dust and other matter collected in cham-

ber N are discharged through the outlet-spout W.

The machine constructed as above explained is found in practice to be extremely efficient and to perform a large amount of work in a given time. It may be used alone or combined with other apparatus for grinding, purifying, or otherwise treating grain or its products.

I am aware that it is not new to construct a drum or screening-wheel with two sets of spokes in different horizontal planes, the spokes of one set being arranged midway between those of the other set, and the screening material being wound over and under the upper and lower spokes alternately. I do not claim such construction, nor does it give the result attained by my plan. The construction just mentioned necessitates a waste of the screening material, because it must be cut wider at the outer than at the inner part of the drum in order to compensate for the wider spread of the spokes. By my construction each section is completed before the wheel or drum is put together, and the material can be stretched and tacked with perfect ease, whereas great difficulty is experienced in tacking or otherwise securing the material in the narrow spaces between the spokes.

Another and important advantage of my construction is that in case of injury to any part of the screening material the particular section in which the injury occurs can be withdrawn, repaired, and replaced, or a new section substituted quickly and with ease. The greatest advantage of this construction is, however, found in the increased surface secured.

As fully set forth in the specification, the inner ends of each pair of screens forming a section are joined and lie parallel and close to each other, closing the inner ends against entrance or escape of air. In like manner the inner ends of the respective sections are closely laid together, and as a result the utmost space is utilized, whereas under former constructions the available space was reduced just in proportion to the spread or separation of the inner ends of the screens. The difference is very considerable.

Having thus described my invention, what I claim is—

1. In a dust-collector, a drum or wheel composed of a series of sections each composed of two screen-frames united along their upper edges and inner ends, and separated at the

opposite edges and ends, substantially as described and shown.

2. In a dust-collector, a drum or wheel, G, composed of independent removable sections H, each covered on its sides and outer end with screening material, said sections abutting at their lower edges and inner ends, as shown and described.

3. In a dust-collector, the combination of a casing, a rotary screening wheel or drum therein, a dead-air chamber embracing a part of the circumference of said wheel, a fan for producing an upward current through the casing and wheel, an outlet-trunk from said fan opening into the atmosphere, a branch trunk connecting the main trunk with the dead-air chamber, and a valve arranged, substantially as shown, to regulate the flow of air from the main trunk into the secondary trunk, for the purpose explained.

4. In combination with the casing A, having ledge L, packing M, dead-air chamber N, and chamber p, drum or wheel G, fan B, and guard O, extending over that portion of the drum opposite chamber p, and provided at its edges with flexible curtains, substantially as and for the purpose set forth.

5. In combination with casing A, fan B, and screening-wheel G, depositing-chamber N, provided with hinged valves or sections U, and springs V, for holding said valves against the wheel G.

6. The herein-described screening-wheel for dust-collectors, consisting of central shaft, I, supporting-wheel or skeleton platform J, sections H, each composed of two screens united at one longitudinal edge and at one end, and a clamping-disk, K, all combined and arranged substantially as set forth.

7. In a screening-wheel for dust-collectors, the combination of a central shaft, I, a supporting-wheel or skeleton platform, J, secured thereto, and provided with grooved arms, sections H, consisting of frames b, united along their upper edges and inner ends, and having their sides and outer ends covered with screening material, and a clamping-disk, K, bearing against the upper edges of the sections, and serving to hold their lower edges in the grooved arms of wheel J, as explained.

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Witnesses:

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