

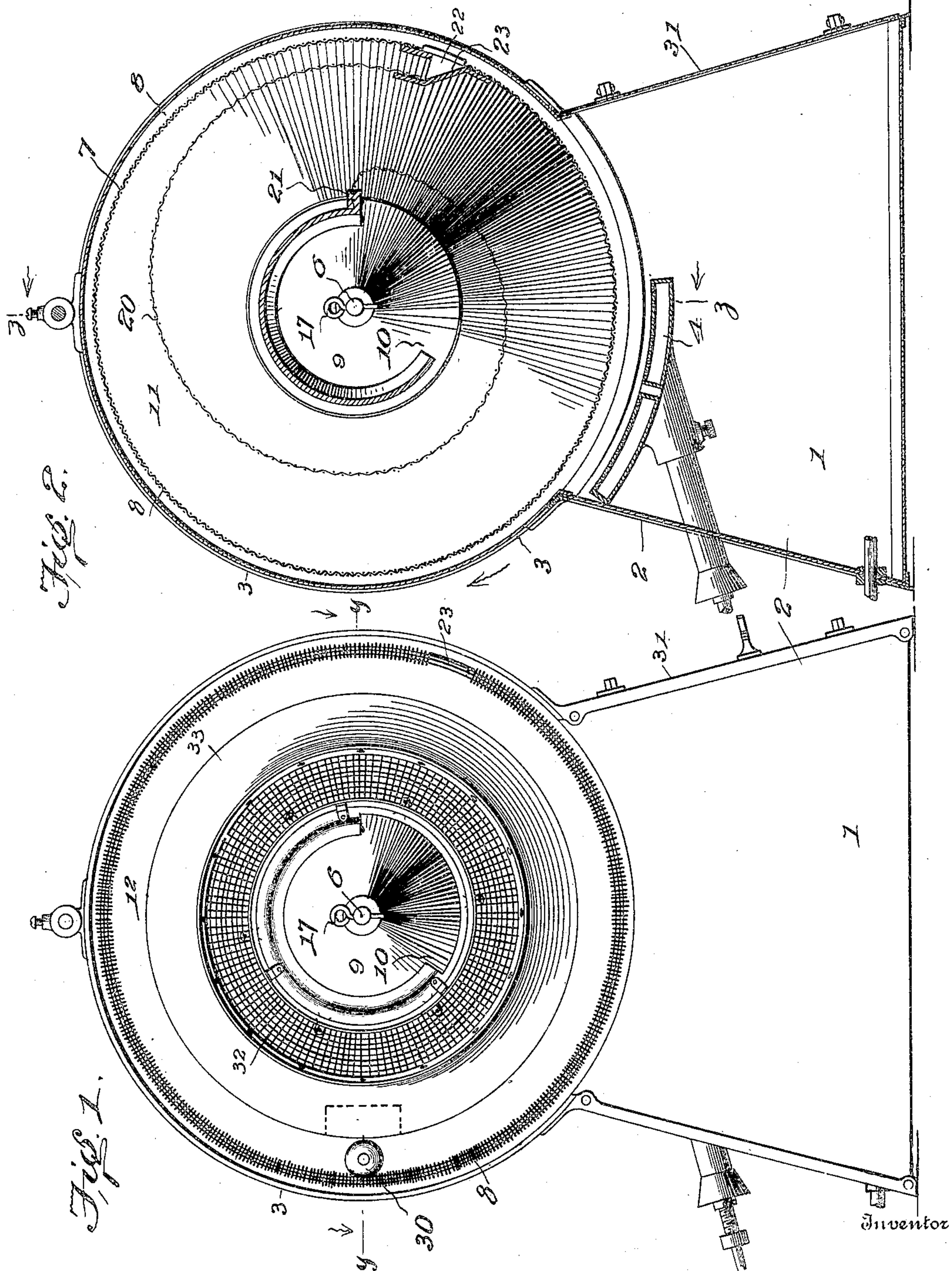
No. 808,734.

PATENTED JAN. 2, 1906.

H. W. EAKINS.
CORN POPPER.

APPLICATION FILED JULY 31, 1903.

4 SHEETS—SHEET 1.



Witnesses

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4 SHEETS—SHEET 2.

Fig. 3.

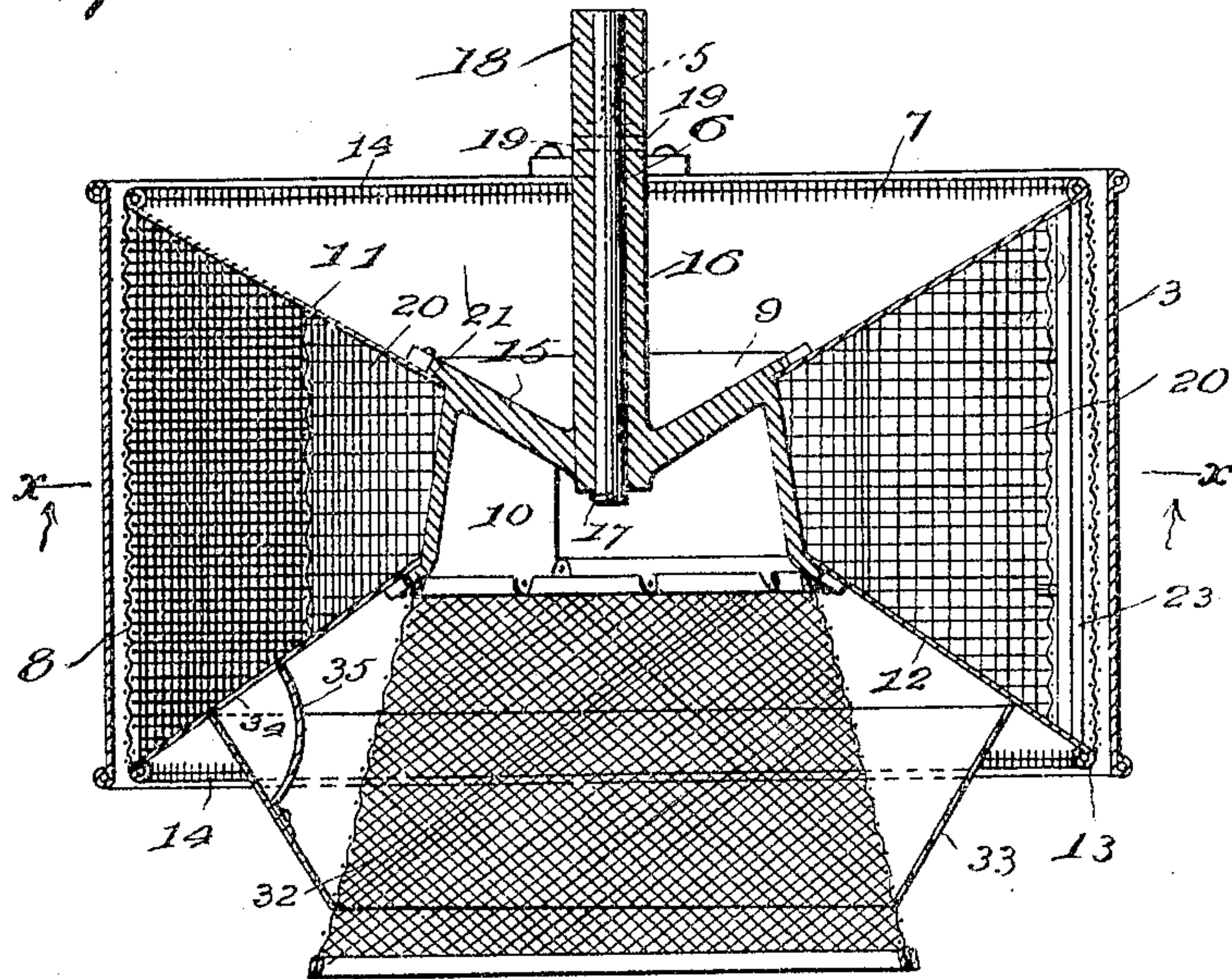
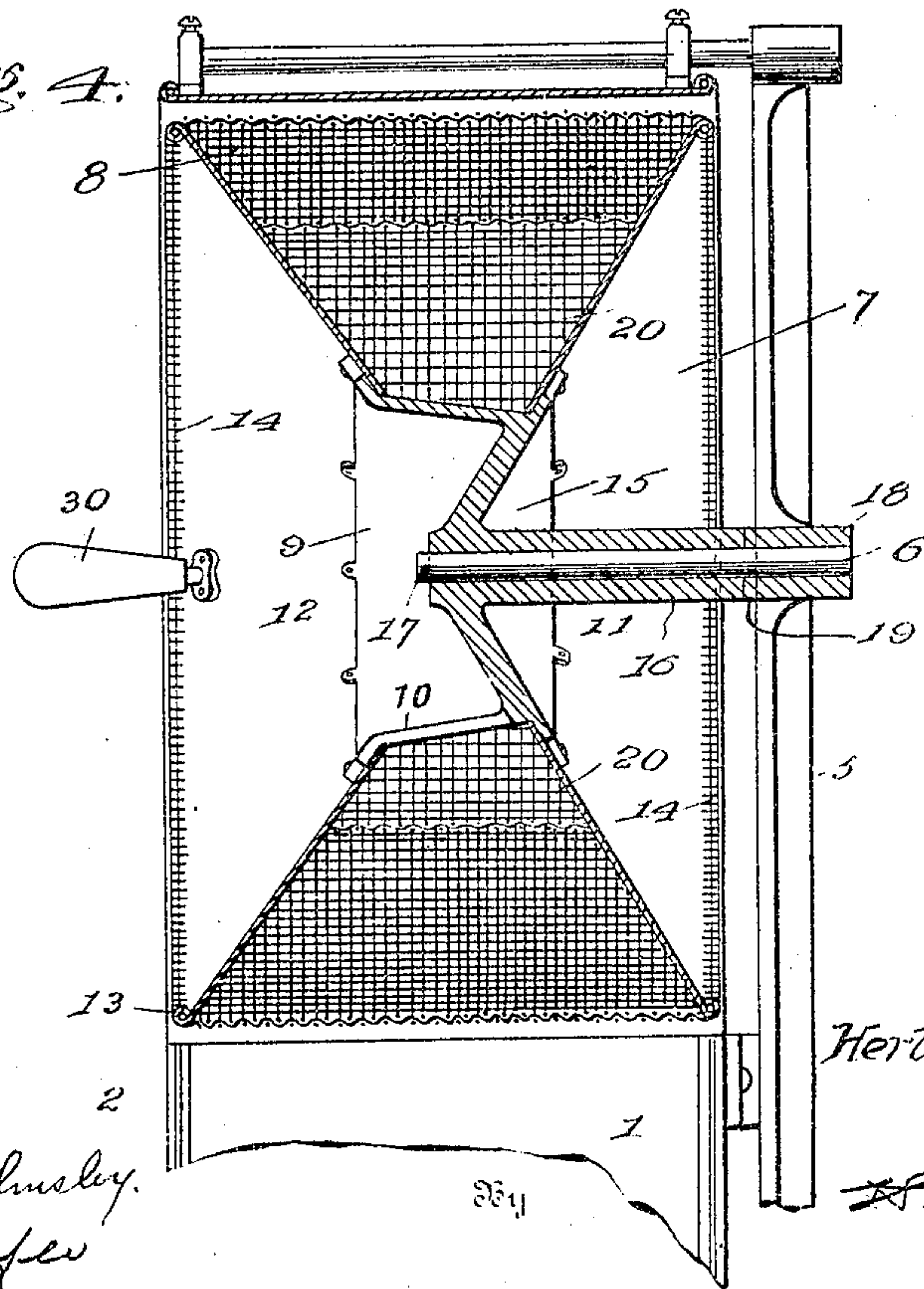


Fig. 4.



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4 SHEETS—SHEET 3.

Fig. 5.

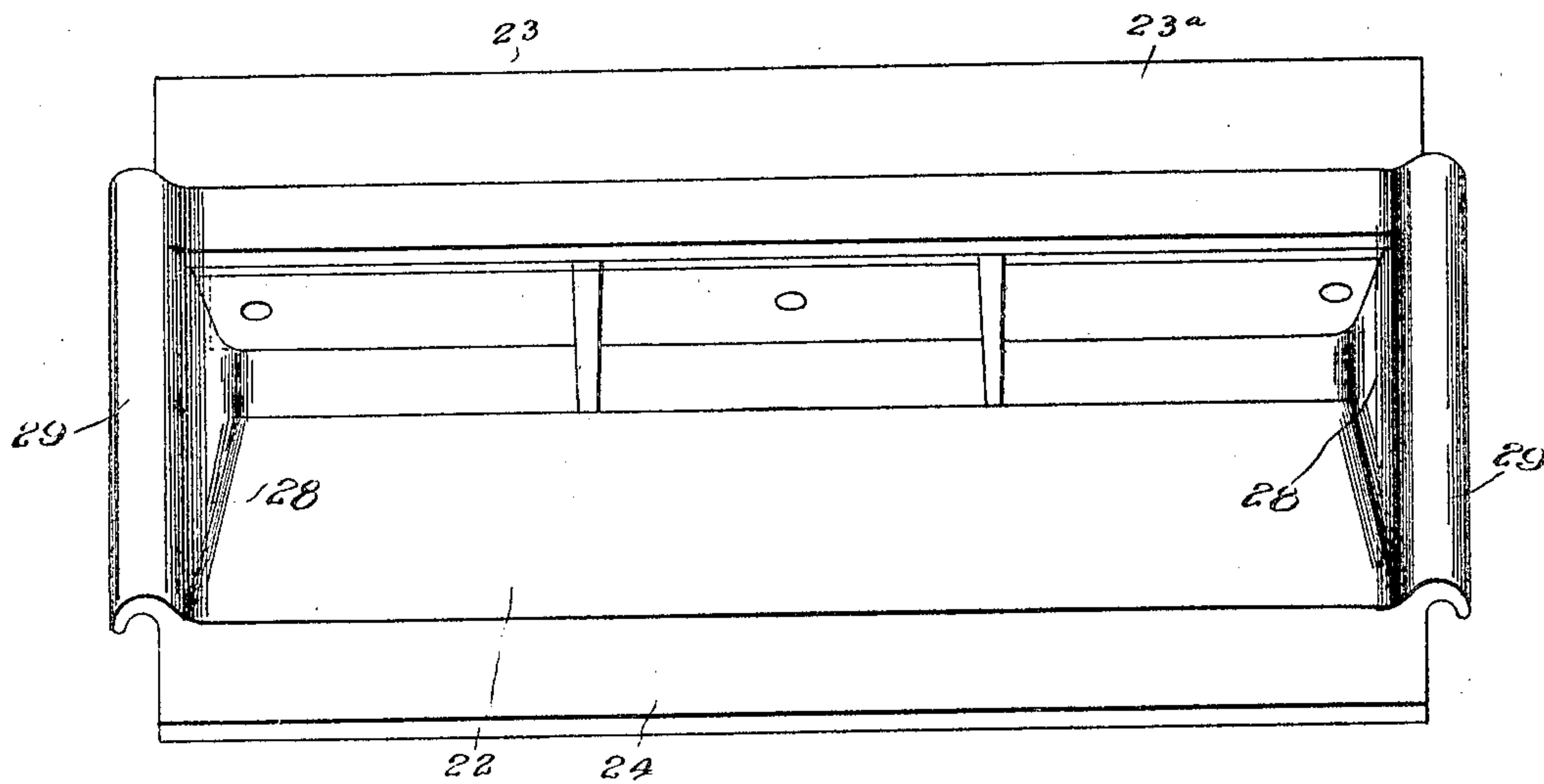
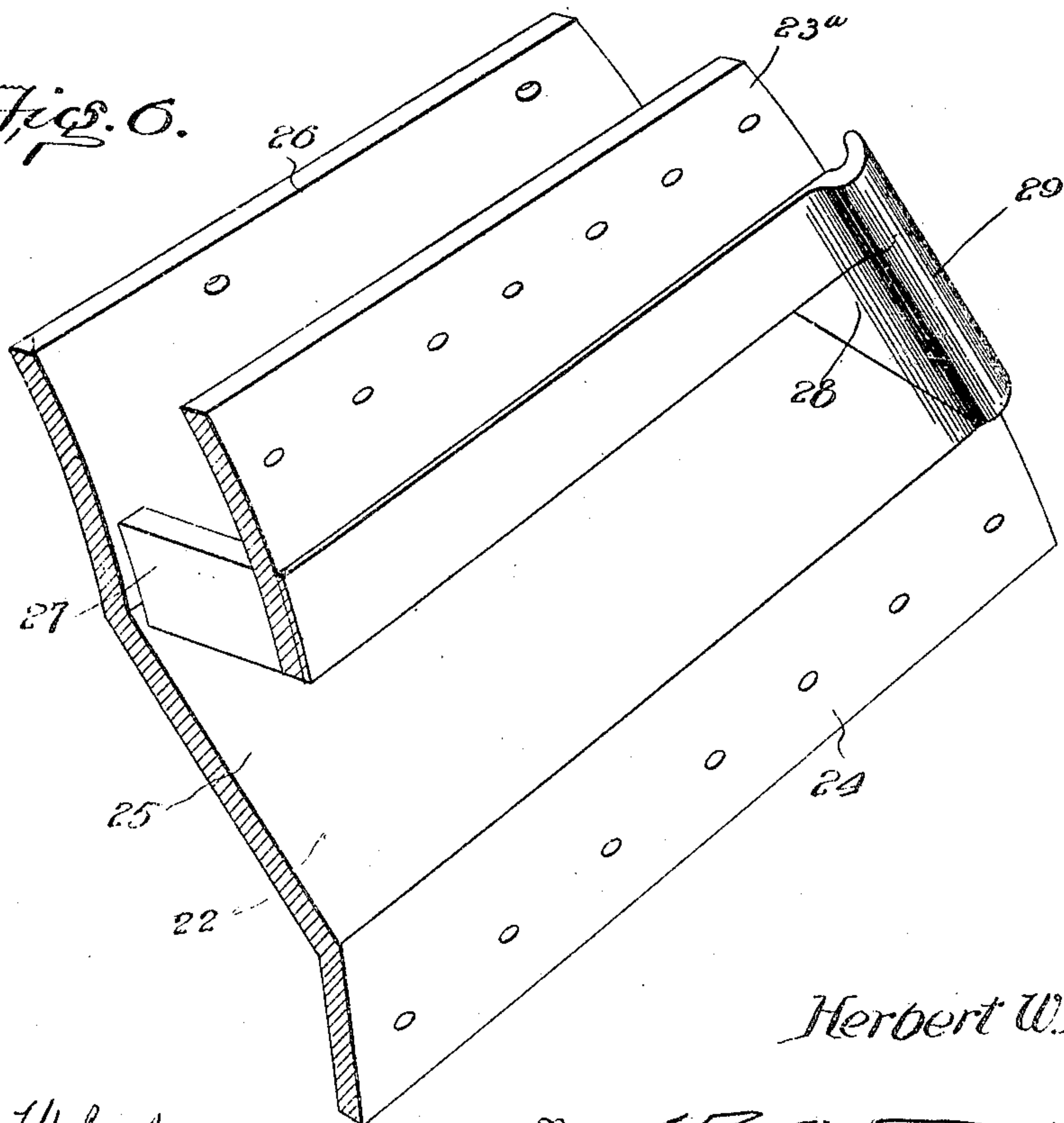


Fig. 6.



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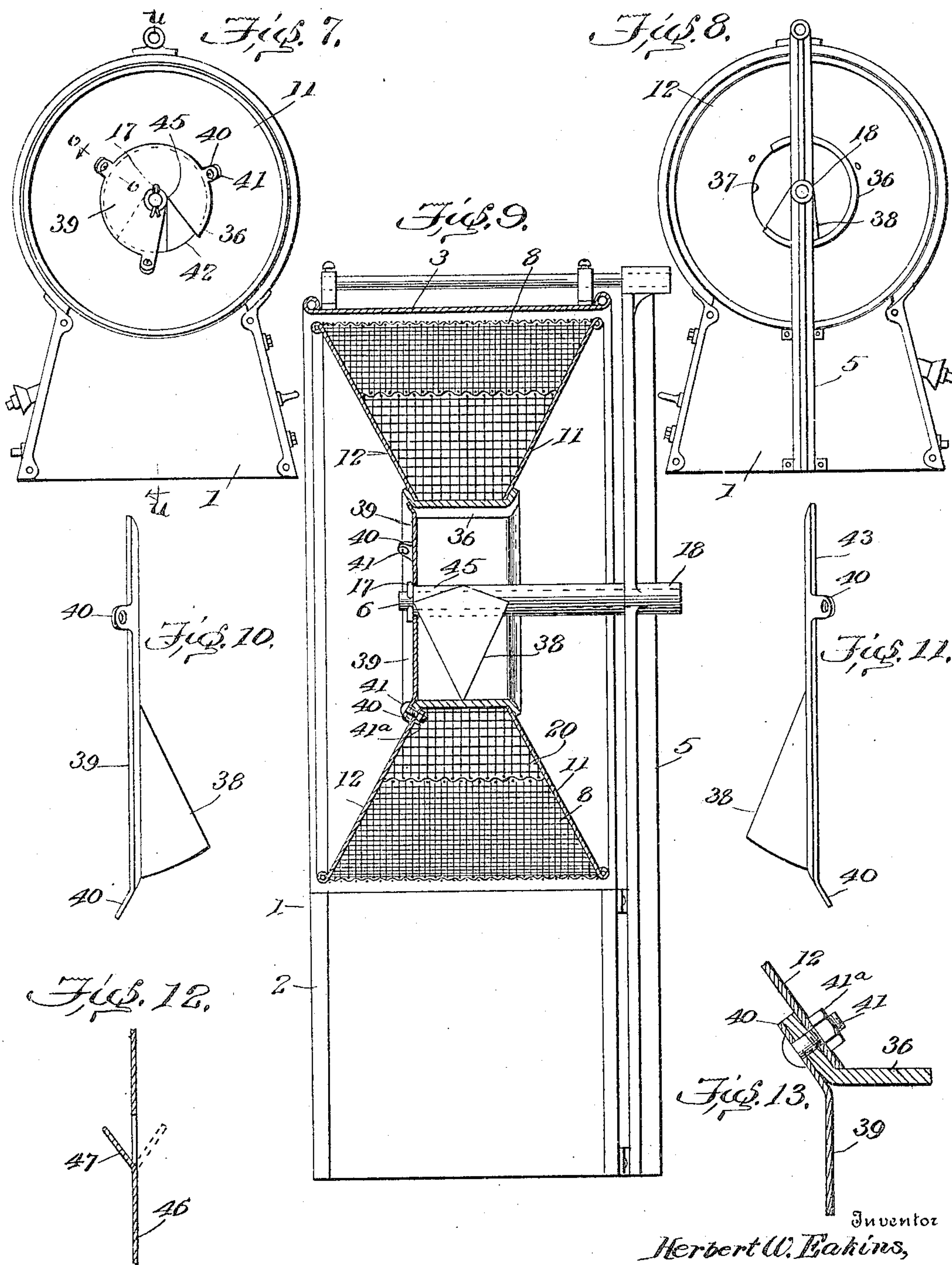
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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CORN-POPPER.

No. 808,734.

Specification of Letters Patent.

Patented Jan. 2, 1906

Application filed July 31, 1903. Serial No. 167,669.

To all whom it may concern:

Be it known that I, HERBERT W. EAKINS, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Corn-Poppers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to corn-poppers, and has for its object to provide a simple and efficient valveless corn-popper of the rotary-cylinder type.

To these and other ends the invention consists in certain novel features, which I will now proceed to describe and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 is a front elevation of a structure embodying my invention in one form. Fig. 2 is a vertical sectional view of the same, taken on the line *xx* of Fig. 3 and looking in the direction of the arrows. Fig. 3 is a plan section taken on the line *yy* of Fig. 1 and looking in the direction of the arrows. Fig. 4 is a vertical sectional view taken on the line *zz* of Fig. 2 and looking in the direction of the arrows. Fig. 5 is a detail view in elevation of the casting forming the waste-discharge opening. Fig. 6 is a detail perspective view of a portion of the same. Fig. 7 is a detail elevation of a modified form of my invention, the same being viewed from the closed side thereof. Fig. 8 is a similar view of the opposite side of the structure shown in Fig. 7. Fig. 9 is a detail sectional view taken on the line *uu* of Fig. 7 and looking in the direction of the arrows. Fig. 10 is a view of the form of closure or discharge-plate employed to direct the discharge at one side of the machine. Fig. 11 is a view of the form of plate employed to effect the discharge at the other side of the machine. Fig. 12 is a view of a modified form of the plates shown in Figs. 10 and 11, and Fig. 13 is a detail sectional view taken on the line *vv* of Fig. 7.

In the said drawings I have shown two embodiments of my invention, the first or preferred form of the machine being illustrated in Figs. 1 to 6, inclusive, while the remaining figures illustrate a modification.

I will first describe the machine shown in Figs. 1 to 6. In said figures, 1 indicates as a whole a suitable casing and support, compris-

ing a hollow base portion 2, preferably rectangular in cross-section and with upwardly-converging ends, and a cylindrical upper portion 3, open at the front, rear, and bottom. The base portion 2 contains the burner or other heating apparatus 4, which may be of any suitable construction, while the upper cylindrical portion of the casing contains the popping-cylinder. At the rear of the casing 1 there arises a standard 5, in which is mounted the forwardly-extending shaft or axis 6 of the popping-cylinder. This popping-cylinder (designated as a whole by the reference-numeral 7) comprises an outer portion of relatively greater length, an inner portion of relatively lesser length, and inwardly-converging heads or ends connecting the outer and inner portions. The outer relatively long portion consists of a cylindrical screen 8 of relatively fine mesh, the openings therein being sufficiently small to prevent the passage through them of the unpopped corn. The inner and relatively short portion of the popping-cylinder consists of a hollow drum 9, open at its front end and closed at its rear end. In the preferred form of my invention (shown in Figs. 1 to 6, inclusive) this inner portion or drum is in the form of a frustum of a cone, being of larger diameter at its open or discharge end than at its closed end. The body of this drum is provided with an opening 10, preferably extending around a little more than one-fourth of its circumference, said opening forming the means for the entrance of the popped corn into the interior of said drum. The rear head of the cylinder is indicated at 11 and the front head at 12. Both of these heads or ends are frusto-conical in shape, converging inwardly from the outer screen to the inner drum, and are preferably constructed of sheet-iron. Their outer margins are preferably strengthened by means of a bead 13, and the wire fabric of which the screen 8 is composed is preferably secured in position by bending it around the beaded edges of the ends, as indicated at 14. This forms a simple and inexpensive mode of securing the screen in position. The plate or diaphragm 15, which closes the rear end of the drum, is preferably conical in shape, so that its surface forms a continuation of the rear head or end 11 of the popping-cylinder. Said popping-cylinder is provided with a bearing-sleeve 16, which fits upon the shaft 6.

Preferably the body of the drum 9, the plate 15, closing the rear end of said drum, and the bearing-sleeve 16 are all formed in one integral casting. The popping-cylinder is remov-
 5 ably held in position upon the shaft 6 by means of a pin 17, which limits the forward movement of the drum, the standard 5 having a sleeve 18, in which the shaft 6 is supported, which sleeve limits the rearward motion of the
 10 popping-cylinder, washers 19 being interposed between the sleeves 16 and 18. Within the popping-cylinder there is located a screen 20, of coarser mesh than the screen 8, the openings therein being of such size as to permit
 15 the passage through them of the unpopped corn, while preventing the passage of the popped corn. This screen 20 is a volute screen, its inner end being connected at 21 to the drum 9 at one end of the opening or mouth
 20 10 thereof. The screen 20 extends from its inner point of attachment in a spiral curve across the opening 10 and around the drum 9, its outer end being connected to the screen 8. This connection at the outer end is preferably
 25 effected in an indirect way by means of the structure shown in detail in Figs. 5 and 6. The outer screen is here provided with a discharge-mouth 22, formed in a casting 23. (Shown in detail in Figs. 5 and 6.) Said cast-
 30 ing is provided with flanges 23^a and 24 on opposite sides of the mouth 22, to which flanges the ends of the screen 8 are secured. Said casting is further provided with an inclined portion 25, extending into the popping-cyl-
 35 nder and provided with a terminal flange 26, to which the outer end of the screen 20 is secured. Uprights 27 connect the flanges 26 and 23^a. The casting is provided with end plates 28, terminating in curved or hooked-
 40 like flanges 29, which fit over the margins of the heads 11 and 12. Rotary motion may be imparted to the popping-cylinder in any suitable manner—as, for instance, by means of a handle 30, secured to the front head 12.
 45 The apparatus so far as thus described is a complete and efficient popper in itself. The parts being in the position shown, the unpopped corn may be introduced in the interior of the popping-cylinder through the open end
 50 of the drum 9 and will pass down through the opening 10 in the body of said drum and through the large-mesh screen 20, resting upon the small-mesh screen 8 above the heating-burner, where it is popped. The passage of
 55 the unpopped corn through the inner screen and the operation of popping may be facilitated by imparting an oscillating movement to the popping-cylinder. The cylinder is then rotated in the direction indicated by the
 60 large arrow in Fig. 2, whereupon the corn will pass on to the outer end of the volute screen 20. The corn remains in the lower part of the cylinder, so that when the cylinder is rotated the outer end of the screen 20 ap-
 65 proaches and passes under the corn, which

then rests upon the inner surface of said screen 20, said screen passing under the corn. The popped corn will remain within the screen 20, while the unpopped corn will fall
 70 through the same, dropping again onto the outer screen 8. As the cylinder continues to revolve the popped corn will be delivered from the inner surface of the screen 20 through the opening 10 into the interior of the drum 9, from the open front end of which drum it will
 75 be discharged into any suitable receptacle. The relative shortness of the central drum so limits its capacity that the popped corn can not merely accumulate therein without passing out at the open end, but is, on the contrary,
 80 promptly discharged at said open end. This discharge is materially facilitated by the inclination of the wall of the drum due to its conical shape. The employment of a relatively long outer cylinder and a relatively
 85 short inner drum in connection with the inwardly-converging ends or heads of the popping-cylinder provides an extended popping-surface, so that a large quantity of corn can be popped, and causes this relatively large
 90 mass of popped corn to converge and be delivered in a relatively small space in the inner drum, from which it is rapidly and effectually discharged by reason of its accumulation and by the force of gravity. After all of the
 95 corn that will pop has been popped there remains more or less imperfect and partially-popped corn, which may be readily discharged by rotating the popping-cylinder in a direction the reverse of that just described. The
 100 imperfect corn and trash will then be discharged through the discharge-mouth 22 of the outer screen and will fall into the base portion 2 of the casing, which is provided with a door 31 to facilitate its removal.
 105

In the popping of corn some unpopped or partially-popped corn usually passes out of the machine along with the finished product, and it is customary and, in fact, necessary to
 110 give the output of the machine a further or secondary screening in order to remove this detrimental substance. This has heretofore been done by means of a separate apparatus, such as an ordinary hand-screen. I have made
 115 provision whereby this secondary screening is performed by the machine itself in connection with its other operations and simultaneously therewith. To this end I attach to the discharge-mouth of the machine, which is
 120 in the present instance the open end of the drum 9, a frusto-conical screen 32 of large mesh, said screen being open at both ends and having its smaller end connected to and communicating with the discharge-mouth of the
 125 popping-cylinder. A frusto-conical plate 33 has its smaller end connected to the screen 32, near the larger end thereof, the larger end of the plate 33 being connected to the head 12. The head 12 has formed through it an open-
 130 ing 34, lying immediately inward from the

edge of the plate 33, and a guard-plate 35 extends from the inner edge of said opening 34 outward to a connection with the plate 33. It results from this construction that when the material is discharged from the popping-cylinder it falls upon the screen 32, and owing to the inclination of said screen it travels outward over the same. The fully-popped corn cannot pass through the screen 32, but is discharged at the large end thereof. The unpopped or partially-popped corn passes through the screen 32 and falls into the space between said screen and the plate 33 and head 12, in which space it accumulates in the trough-like space formed by the junction of the head and plate. When the opening 34 is in its lowermost position, the unpopped or partially-popped corn will pass through said opening back into the popping-cylinder to be again subjected to the popping operation. The guard-plate 35 serves to prevent the corn which is popping in the cylinder from jumping out through the aperture 34 into the space between the head 12 and plate 33. If a popping grain does thus pass through said opening, it will strike the guard-plate 35 and will then fall back through the opening 34 into the cylinder again.

While I have described the inner drum as being preferably frusto-conical in shape to facilitate the discharge of the popped corn therefrom, such a form of said drum is not absolutely necessary. In Figs. 7 to 13, inclusive, I have shown a structure similar in its general features to that already described. The inner drum is, however, in this case cylindrical in form, being indicated by the reference-numeral 36. The opening in the body of said drum is indicated at 37, and in front of the forward edge of said opening (using the term "forward" with reference to the normal direction of the rotation of the drum) there is located a wedge-like or prism-shaped deflector 38, the inclined sides of which will divert the corn toward either end of the drum, which latter is open at both ends. If this deflector is used alone, the popped corn will be discharged at each end of the drum. I prefer, however, to employ a plate 39 in connection with the deflector, said plate closing one end of the drum, to which it may be detachably secured in any suitable manner—as, for instance, by means of lugs 40 and screws 41, screwing into nuts 41^a, brazed to the inner sides of the heads 11 and 12. This plate is provided with an inclined wing or blade 42, which extends into the drum into contact with one side of the deflector 38, so that the plate, deflector, and wing completely close one end of the drum, the popped corn being discharged from the other end. A similar plate 43, having a reversely-arranged wing 44, may be applied to the other end of the drum, the plate 39 being omitted, in which case the popped corn will be discharged from the opposite end

of the drum. Thus with this arrangement the corn may be discharged from either end of the cylinder at will. While I have described two separate plates 39 and 43 as being employed to effect this result, said plates being ordinarily constructed of relatively thin sheet metal, a single plate may be employed, the wing or blade being bent to either side thereof, as desired. Such a sheet-metal plate is shown in Fig. 12, its body being indicated by the reference-numeral 46 and the wing by the reference-numeral 47, said wing being shown in full lines in one of its two positions and in dotted lines in the other of said positions. In this particular form of construction the deflector 38 is preferably cast in one piece with the body of the drum 36, and a bearing-sleeve 45 to receive the shaft 6 is formed in one piece with said deflector 38.

I do not wish to be understood as limiting myself strictly to the precise details of construction hereinbefore described, and shown in the accompanying drawings, as said details may obviously be modified without departing from the principle of my invention.

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

1. A corn-popper, comprising a rotatable popping-cylinder having a body composed of a relatively long outer portion consisting of a cylindrical screen of relatively fine mesh, a relatively short central portion consisting of a hollow drum closed at one end, open at the other end, and having an opening in its body-wall, and heads or ends converging inwardly from the outer cylinder to the inner drum, and an internal volute screen of relatively large mesh, connected with the outer cylinder at one end, extending around the central drum, and connected with said drum at a point adjacent to the opening in the body-wall thereof, substantially as described.

2. A corn-popper, comprising a rotatable popping-cylinder having a body composed of a relatively long outer portion consisting of a cylindrical screen of relatively fine mesh, a relatively short central portion consisting of a hollow frusto-conical drum closed at its smaller end, open at its larger end and having an opening in its body-wall, and heads or ends converging inwardly from the outer cylinder to the inner drum, and an internal volute screen of relatively large mesh, connected with the outer cylinder at one end, extending around the central drum, and connected with said drum at a point adjacent to the opening in the body-wall thereof, substantially as described.

3. A corn-popper, comprising a rotatable popping-cylinder having a body composed of a relatively long outer portion consisting of a cylindrical screen of relatively fine mesh provided with a peripheral opening, a relatively short central portion consisting of a hol-

low drum closed at one end, open at the other end, and having an opening in its body-wall, and heads or ends converging inwardly from the outer cylinder to the inner drum, and an
5 internal volute screen of relatively large mesh, having one of its ends connected with the outer cylinder at the forward margin of the opening therein, said screen extending around the central drum and being connected therewith
10 at a point adjacent to the rear margin of the opening in the body-wall thereof, substantially as described.

4. In a corn-popper, a popping-cylinder comprising heads and an outer cylindrical
15 screen, an internal volute screen, and a trash-outlet frame or casing having a mouth or opening, said frame being provided with outer flanges extending in opposite directions from said mouth or opening to receive the ends of
20 the outer screen, and said frame being also provided with an inwardly-extending portion provided with a flange to receive the outer

end of the volute screen, substantially as described.

5. In a corn-popper, a popping-cylinder 25 comprising heads and an outer cylindrical screen, an internal volute screen, and a trash-outlet frame or casing having a mouth or opening, said frame being provided with outer flanges extending in opposite directions from
30 said mouth to receive the ends of the outer screen, said frame being also provided with an inwardly-extending portion to which is connected the outer end of the volute screen, said frame being further provided with lat- 35 eral grooved flanges to fit over the margins of the heads, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HERBERT W. EAKINS.

Witnesses:

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IRVINE MILLER.