

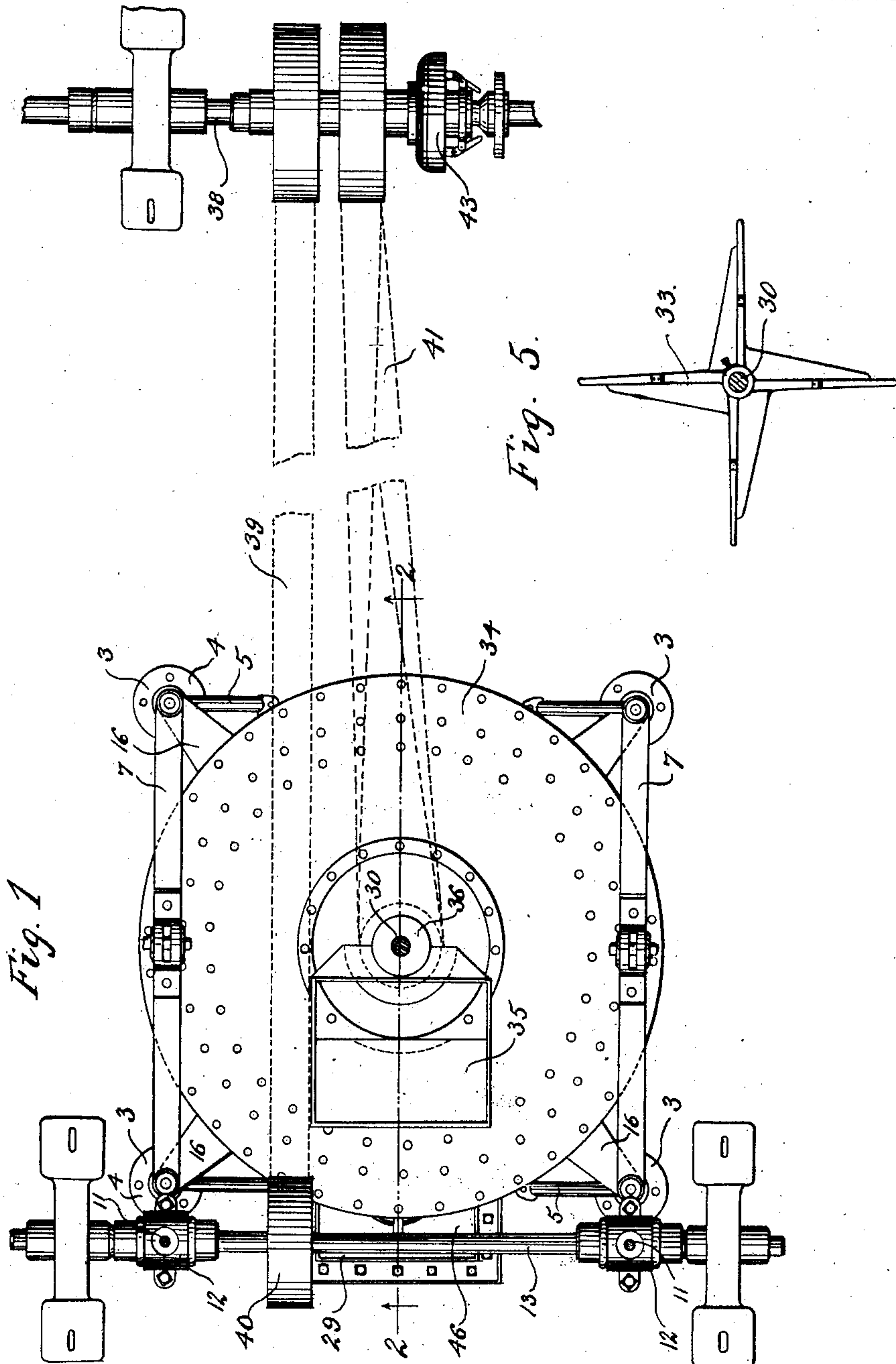
No. 826,731.

PATENTED JULY 24, 1906.

F. MEYER.
SEPARATOR.

APPLICATION FILED APR. 18, 1902.

3 SHEETS—SHEET 1.



Witnesses.

Otto C. Johnson.

Blanche Michael.

Inventor,

Frederick Meyer,

By ~~Rummler & Rummler~~
his Att'ys.

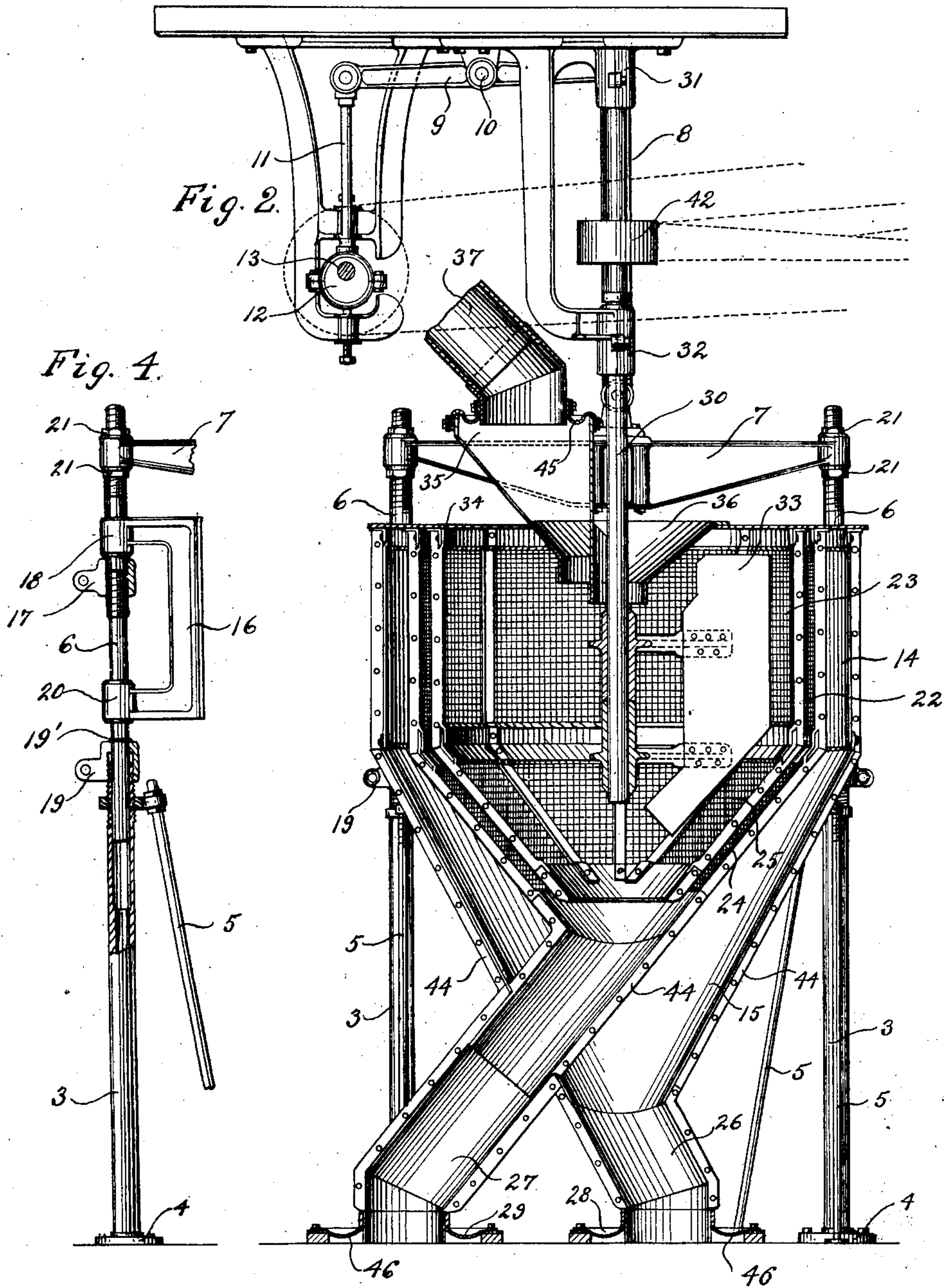
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3 SHEETS—SHEET 2.



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By Rummel & Rummel,
his Attys.

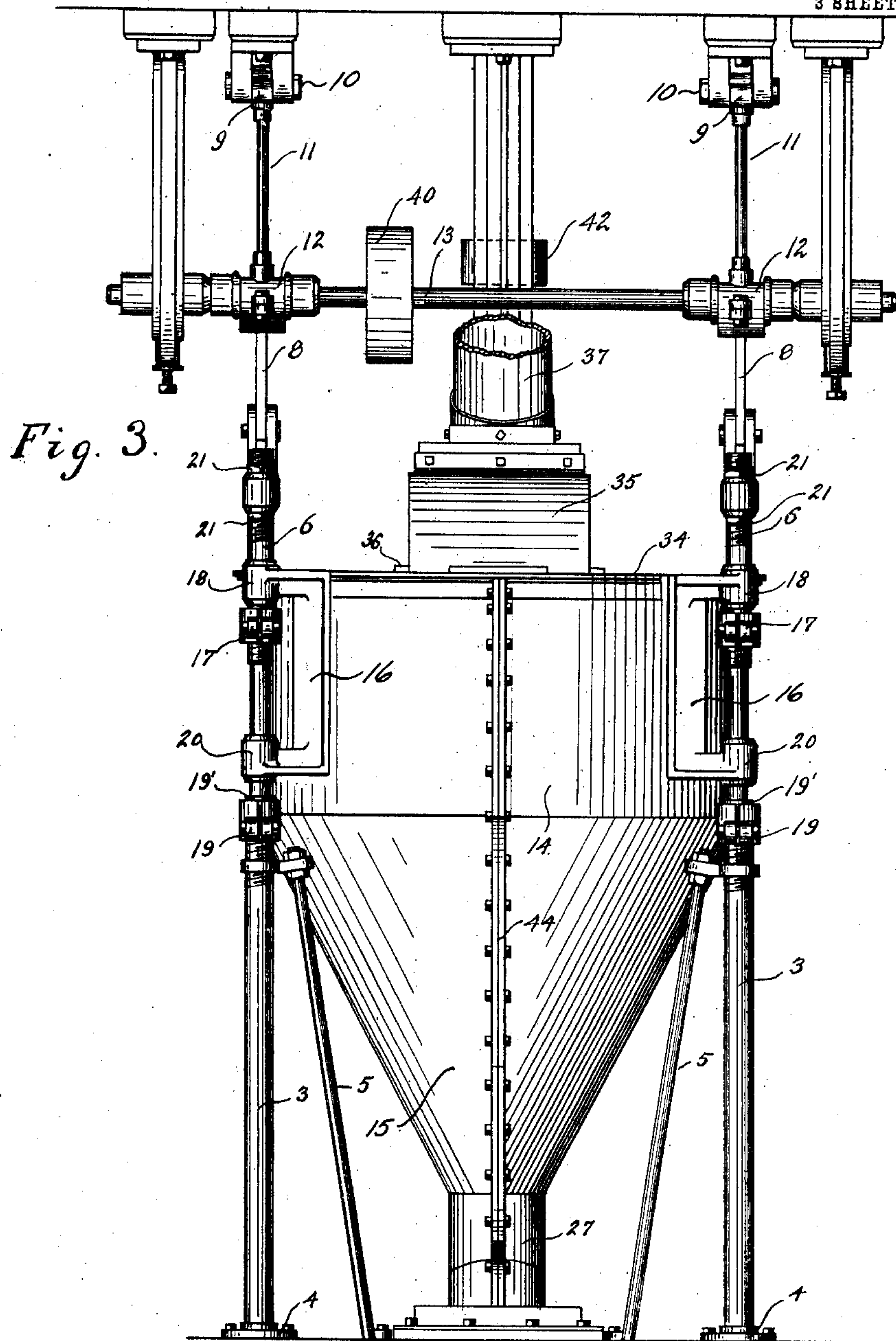
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3 SHEETS—SHEET 3.



Witnesses.
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Blanche Michael.

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UNITED STATES PATENT OFFICE.

FREDERICK MEYER, OF CHICAGO, ILLINOIS.

SEPARATOR.

No. 826,731.

Specification of Letters Patent.

Patented July 24, 1906.

Application filed April 18, 1902. Serial No. 103,560.

To all whom it may concern:

Be it known that I, FREDERICK MEYER, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Separators, of which the following is a specification.

The main object of my invention is to provide an improved form of separator or screening device suitable for quickly and thoroughly separating crushed ore, broken stone, and similar substances into grades of varying degrees of coarseness. I accomplish this object by the device shown in the accompanying drawings, in which—

Figure 1 is a top plan of a device constructed according to my invention, with some of the overhead mechanism removed. Fig. 2 is a vertical section along the line 2 2 of Fig. 1. Fig. 3 is an elevation of the left end of Fig. 1. Fig. 4 is an elevation, partly broken away, of one of the standards of the supporting-frame. Fig. 5 is a top plan of the group of vanes.

In the construction shown the supporting-frame for the main part of the device consists of four hollow vertical standards 3, secured in position by means of base-flanges 4 and rigidly braced by the stays 5. Telescoping into the upper end of each standard 3 and vertically slidable therein is a shaft 6. The shafts 6 are connected in pairs at their upper ends by means of the beams 7, and each of the beams 7 is suspended at the middle of its length from a link 8, which connects same to a working beam 9, fulcrumed at 10 above the beams 7. The working beams 9 are connected, by means of rods 11, to eccentrics 12 on a horizontal shaft 13.

A cylindrical casing 14, having a conical bottom 15, is suspended between the shafts 6 by means of arms 16, which are secured to the shafts 6 and vertically slidable thereon. A locking-nut 17, fitting a threaded part of the shaft 6 and adjustable along same, is adapted to engage the hub 18 of the arm 6, and thus controls the upward movement of the casing 14. A second adjustable nut 19, fitting the screw-threaded upper end of the standard 3, engages the hub 20 of the arm 16 and limits the downward movement of the casing 14. The beams 7 are adjustably connected to shafts 6 by means of nuts 21 on the threaded upper ends of said shafts.

Within the casing 14 and located concen-

trically therewith is an annular screen 22 of wire-netting. The screen 22 is somewhat similar in outline to the casing 14 and is rigidly secured thereto. A second annular screen 23 of wire-netting of coarser mesh than the screen 22 is rigidly secured concentrically within the screen 22. The screens 22 and 23 are also provided with conical bottoms 24 and 25. The bottom 15 of the casing 14 communicates with a chute 26, and a similar chute 27 communicates with the bottom 24 of the screen 22. The chutes 26 and 27 are independent of each other and are adapted to conduct material which is deposited therein to separate receptacles. These receptacles are not shown in the drawings, but the openings leading thereto are indicated at 28 and 29.

A vertical shaft 30 is journaled at 31 and 32 above the casing 14 and extends downwardly into the center of the inner screen 23. Four vertically-disposed vanes 33 are rigidly secured to the shaft 30 and revoluble therewith, as indicated in Figs. 2 and 5. A cover-plate 34 closes the upper end of the casing 14. A small hopper 35 communicates with the interior of the casing 14 through the cover 34, and a funnel-shaped aperture 36 receives the shaft 30 and affords an inlet for air.

37 represents the end of a chute, by means of which material is delivered to the hopper 35.

Power is applied to the device from a counter-shaft 38, (shown in Fig. 1,) which is connected by a belt 39 with the pulley 40 on the shaft 13 and which is connected, by means of a second belt 41, with the pulley 42 on the vertical shaft 30. A single clutch 43 controls the operation of both belts 39 and 41.

The sides of the casing and screens are preferably made in two parts separable along a vertical plane, which is represented as the plane of section in Fig. 2. The corresponding edges of the various parts are provided with flanges 44, which are adapted to be bolted together.

The chute 37 and the hopper 35 are connected by a loose canvas diaphragm 45 to prevent the escape of dust at this place. Similar diaphragms 46 close the openings 28 and 29.

The operation of the device shown is as follows: When the clutch 43 is thrown into its engaged position, the shaft 30 will revolve and carry with it the vanes 33, and the shaft

13 will revolve and through the action of the eccentrics 12 operate the working beams 9 and cause the connecting-links 8 to reciprocate vertically. The casing 14, with the screens 22 and 23, move with the beams 7 as limited by the nuts 17 and 19. The throw of the eccentrics 12 is constant; but the vertical movement of the casing 14 is adjustable by means of the nuts 17 and 19. It will be seen that upward movement of the casing 14 will only take place while the nuts 17 are in engagement with the hubs 18 of the arms 16, and downward movement of the arms 16 is limited by means of the nuts 19. A rubber or leather cushion is preferably inserted between the nut 19 and the hub 20.

From the foregoing it will be seen that the vanes 33 are revolving within the casing 14, while at the same time the casing 14 and its connected screens are intermittently reciprocated vertically. If now material in lumps—such as ore, broken stone, &c.—is introduced from the chute 37 and directed by means of the hopper 35 against the revolving vanes 33 said material will be thrown outwardly by said vanes and against the screen 23. Such of the material which is sufficiently fine will pass through the screen 23 and strike the screen 22. The vertical reciprocation of the casing and screens aids the sifting of the material and keeps same in agitation, thus preventing choking of the screens and casing. Only such material as is sufficiently fine to pass the screen 22 enters the chute 26 and is delivered through the opening 28 to a receptacle, where said material is stored ready for use. Such material as is too coarse to pass the screen 22 enters the chute 27 and delivered to a second receptacle, from which it is returned to the crusher, where it is broken into finer fragments. The inner screen 23 protects the finer screen 22 against injury by large pieces of material which may be hurled outwardly by the vanes 33. The rotation of the vanes also causes a current of air to enter the aperture 36 and blow outwardly, carrying with it all dust and fine particles and insuring the delivery of same into the space outside of the screens and downwardly through the chute 26.

It will be seen that numerous details of the device shown may be altered without departing from the spirit of my invention. I therefore do not confine myself to such details except as hereinafter limited in the claims.

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

1. A separator, comprising a frame, a casing secured to said frame and vertically movable thereon, a vertically-disposed screen secured within said casing in suitable position to provide a space between said screen and the walls of the casing, and movable therewith, a vertical shaft journaled in said frame

and extending into said casing, a vane secured to said shaft and revoluble therewith, suitable mechanism for causing said casing to reciprocate vertically on said frame, suitable mechanism for rotating said shaft, a chute adapted to direct particles of matter against said vane, and suitable chutes communicating independently with the spaces within and without the screen in said casing.

2. A separator, comprising a frame; a casing mounted to reciprocate vertically on said frame; a vertically-disposed rotary shaft extending into said casing and carrying a vane revoluble in said casing; an annular screen secured within said casing to reciprocate therewith, extending around the path of said vane and removed from the walls of said casing to provide a downwardly-extending passage between the screen and said walls; an inlet-chute communicating with the interior of said screen at its upper part; an outlet-chute communicating with the interior of said screen at its lower part, an independent outlet-chute communicating with the space between the walls of said casing and said screen; and means for rotating said shaft and reciprocating said casing and screen.

3. A separator, comprising a frame, a casing mounted to reciprocate vertically on said frame; a vertically-disposed rotary shaft extending into said casing and carrying a vane revoluble in said casing; an annular screen secured within said casing to reciprocate therewith, extending around the path of said vane and removed from the walls of said casing to provide a downwardly-extending passage between the screen and said walls; a hopper communicating with the interior of said screen at its upper part; an inlet-chute having a flexible connection to said hopper; an outlet-chute communicating with the interior of said screen at its lower part and having a flexible extension; an outlet-chute communicating with the space between the walls of said casing and said screen and having a flexible extension; and means for rotating said shaft and reciprocating said casing and screen.

4. In a separator, the combination of a frame, a screen mounted in said frame having vertically-disposed annular perforated walls and being open at the top and bottom, a feed-chute at the upper end of said screen for discharging granular matter downwardly into the same, an air-inlet at the upper end of said screen at one side of said feed-chute, a rotatable vane mounted within said screen and adapted to produce centrifugal air-currents for causing said granular matter to be deflected out of its normal path and against said screen, means for agitating said screen, a hopper below said screen having its mouth adjoining the lower edges of the screen for collecting and discharging the par-

articles which fail to pass through said screen,
and a casing surrounding said screen and
adapted to collect the particles which pass
through the screen, said casing having a
5 downwardly-disposed outlet-chute extend-
ing toward one side of the discharge end of
said hopper.

Signed at Chicago this 14th day of April,
1902.

FREDERICK MEYER.

Witnesses:

WM. R. RUMMLER,
JOHN J. PACKARD.