

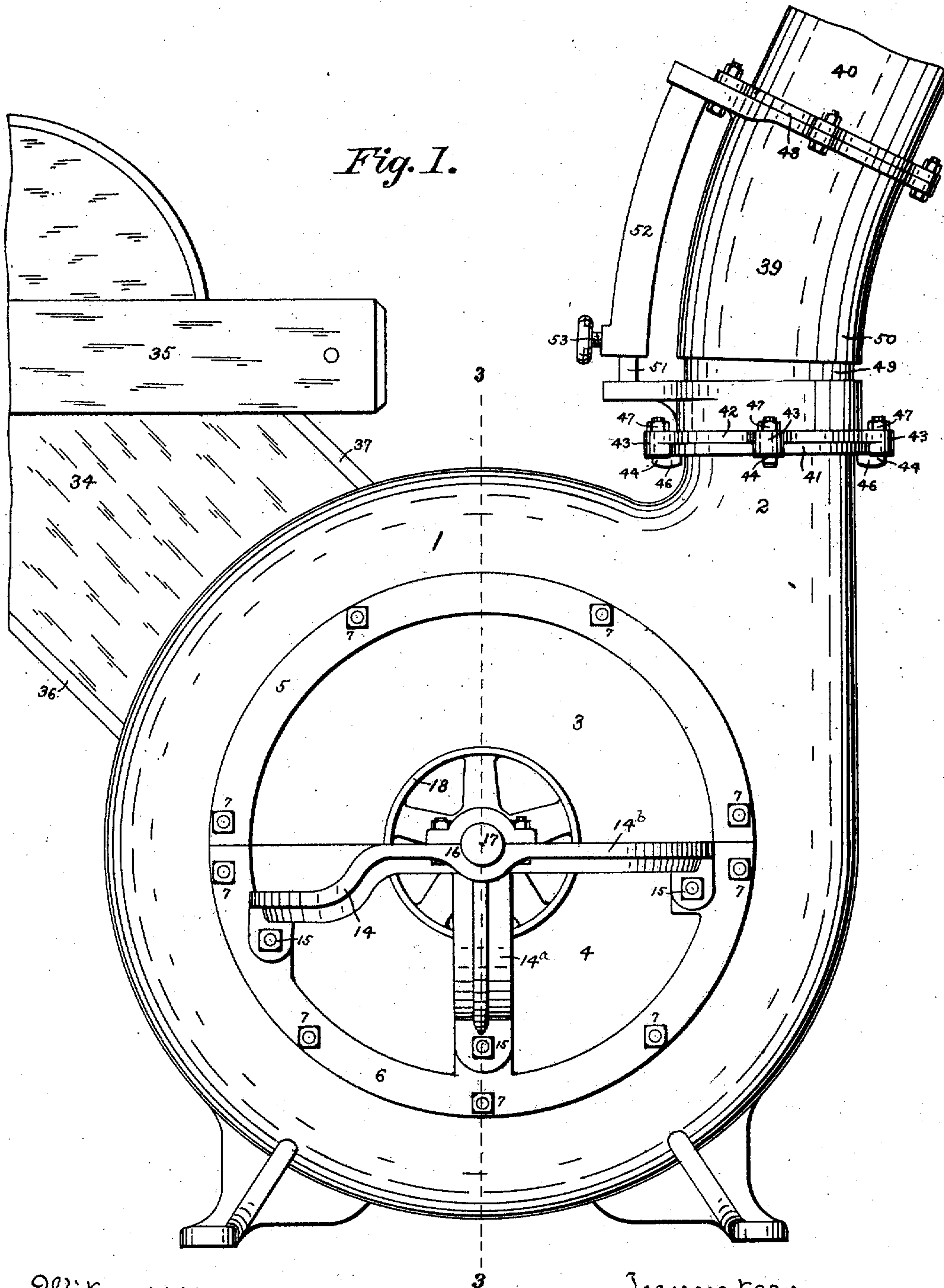
No. 687,960.

Patented Dec. 3, 1901.

F. G. HARRISON.
PNEUMATIC ELEVATOR.
(Application filed July 11, 1901.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses:
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Theo. F. Heim

Inventor;
Frank G. Harrison,
Per *Harry Grease* Attorney

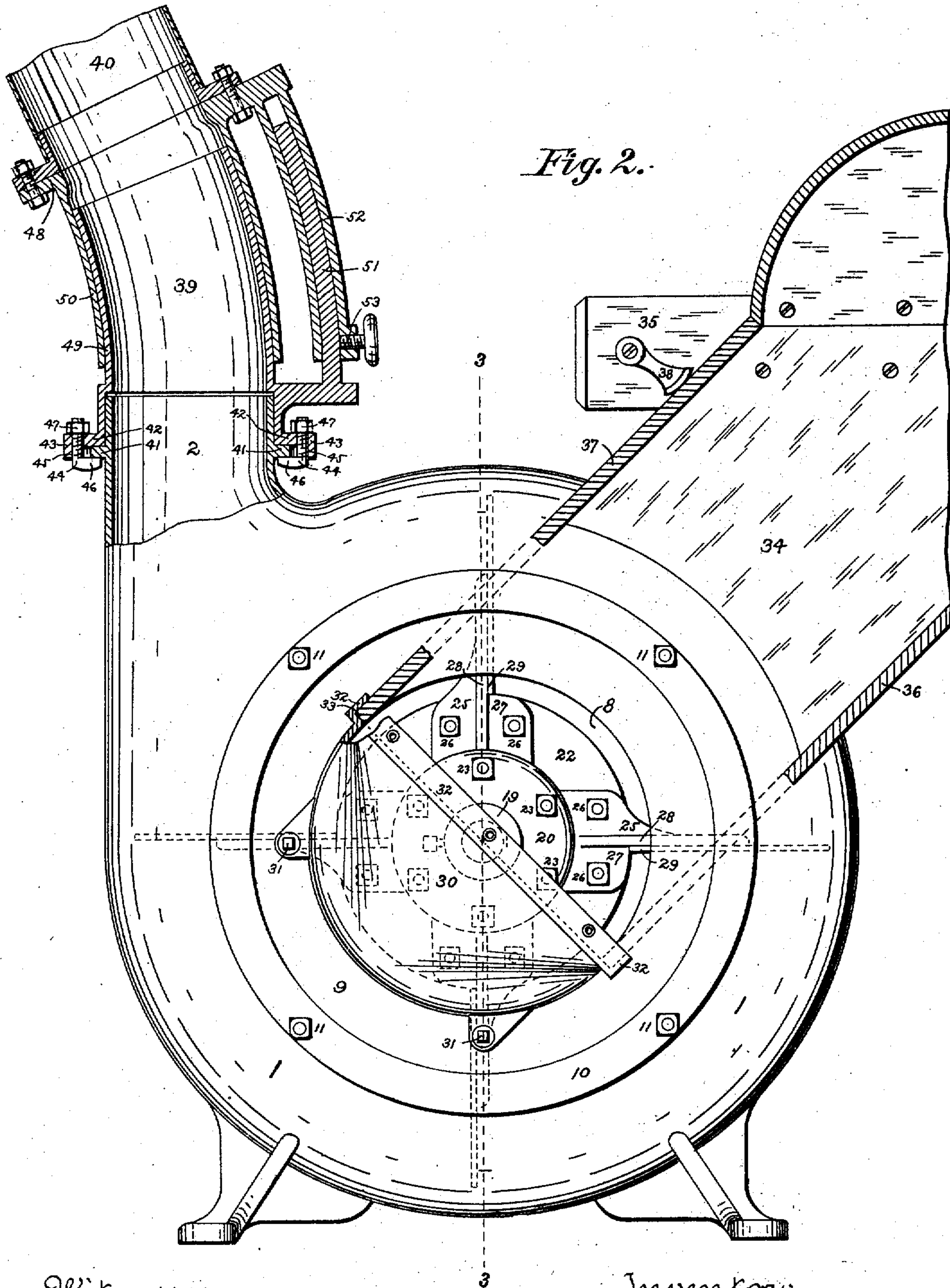
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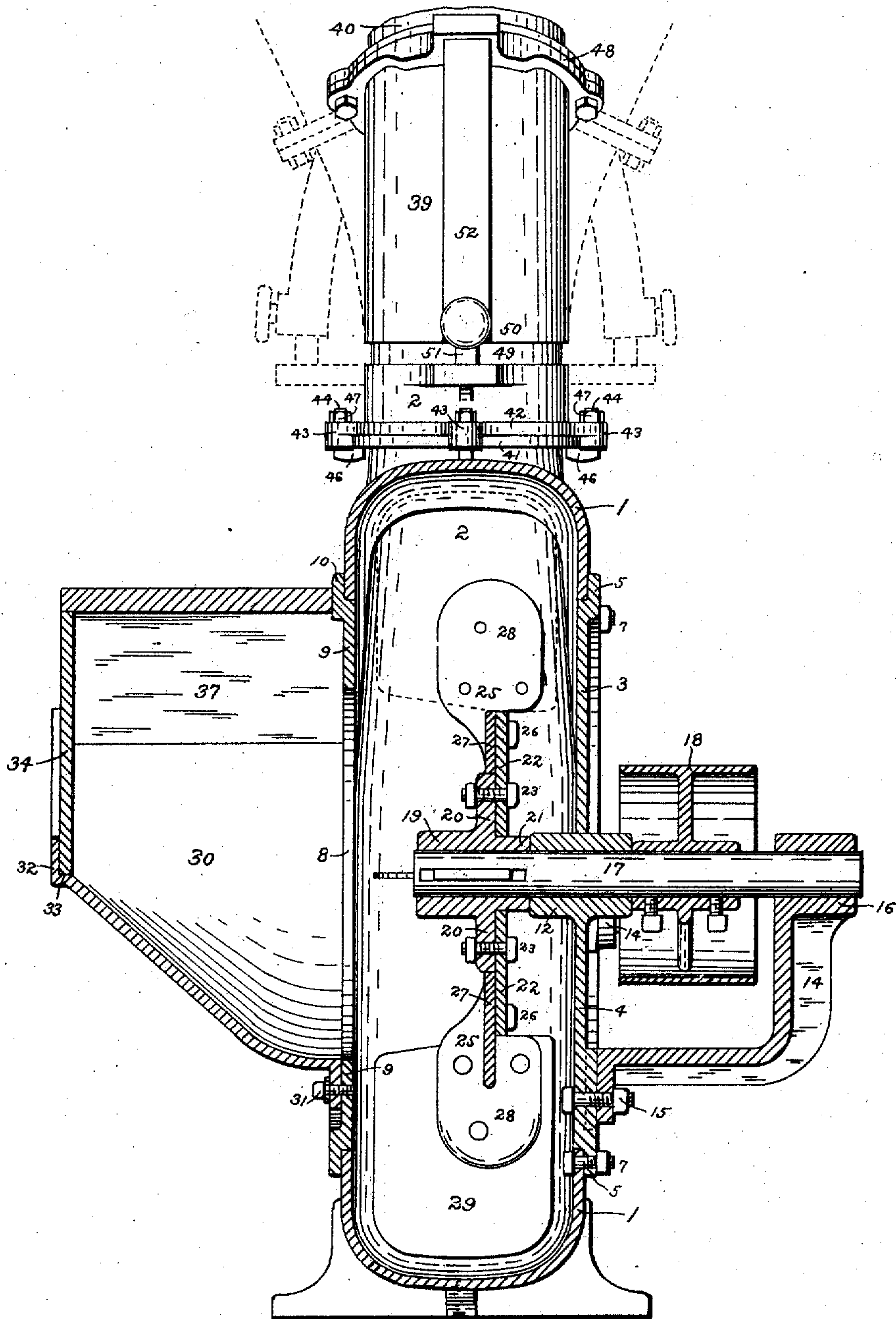


Fig. 3.

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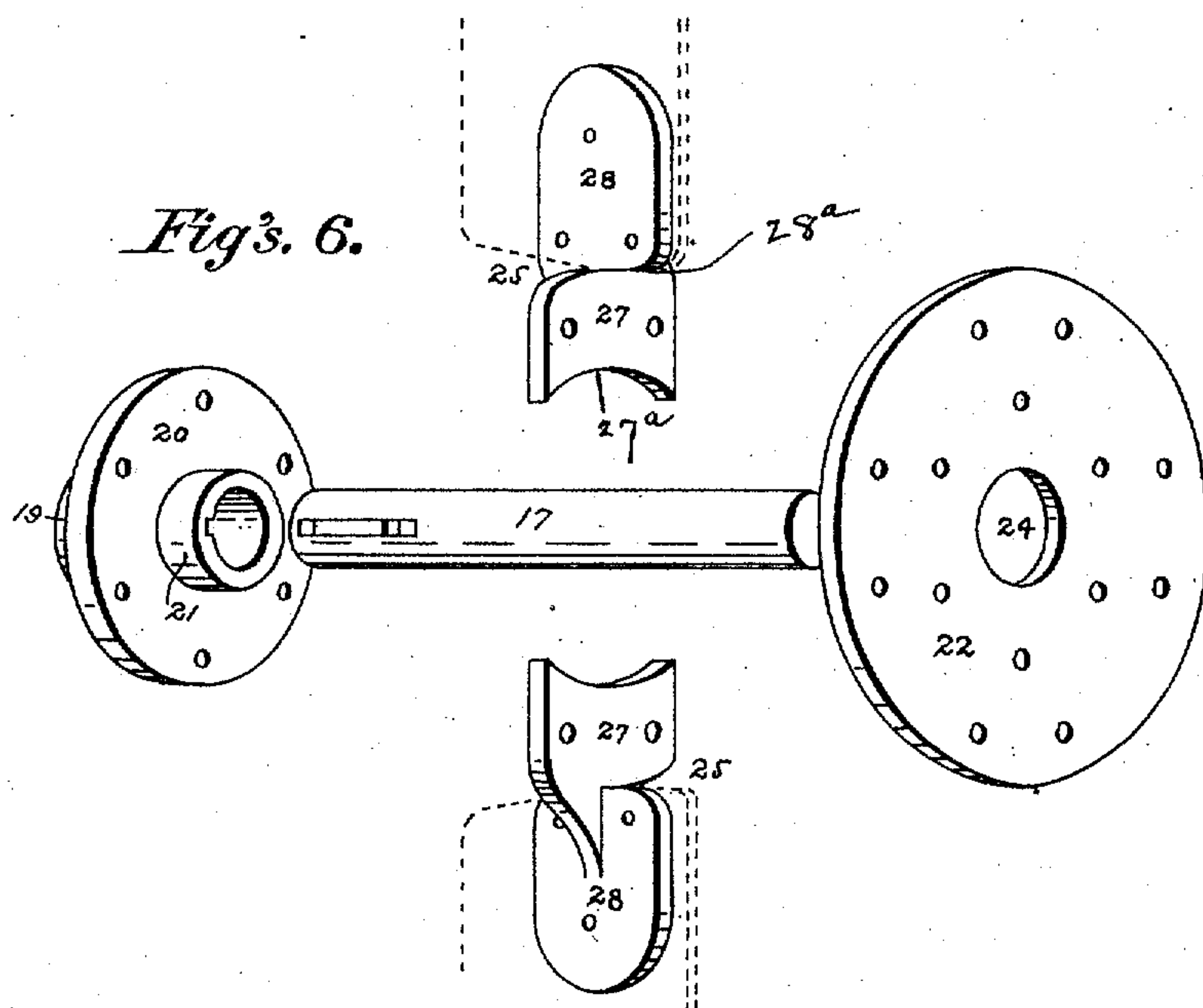
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4 Sheets—Sheet 4.



Fig's. 5.

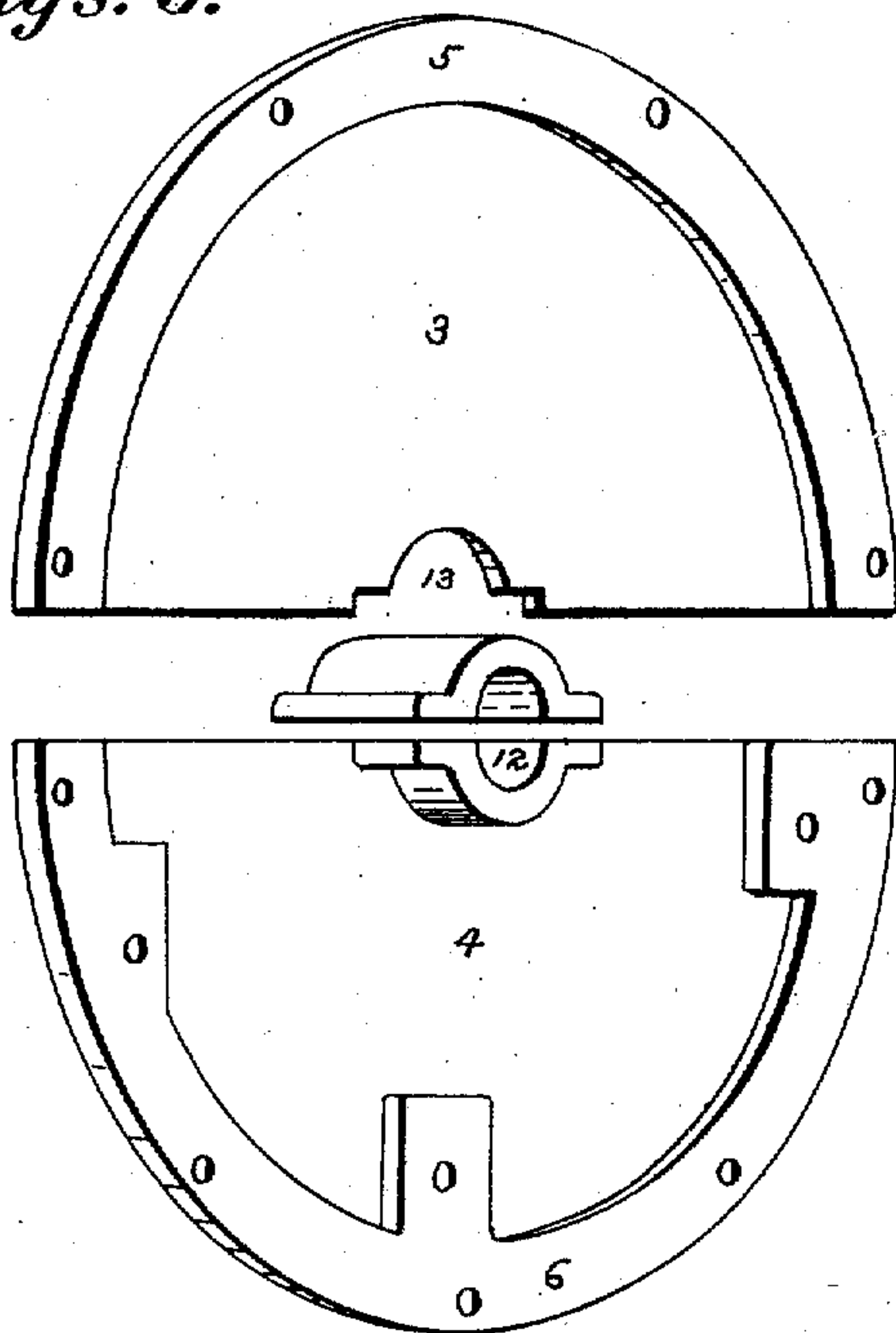
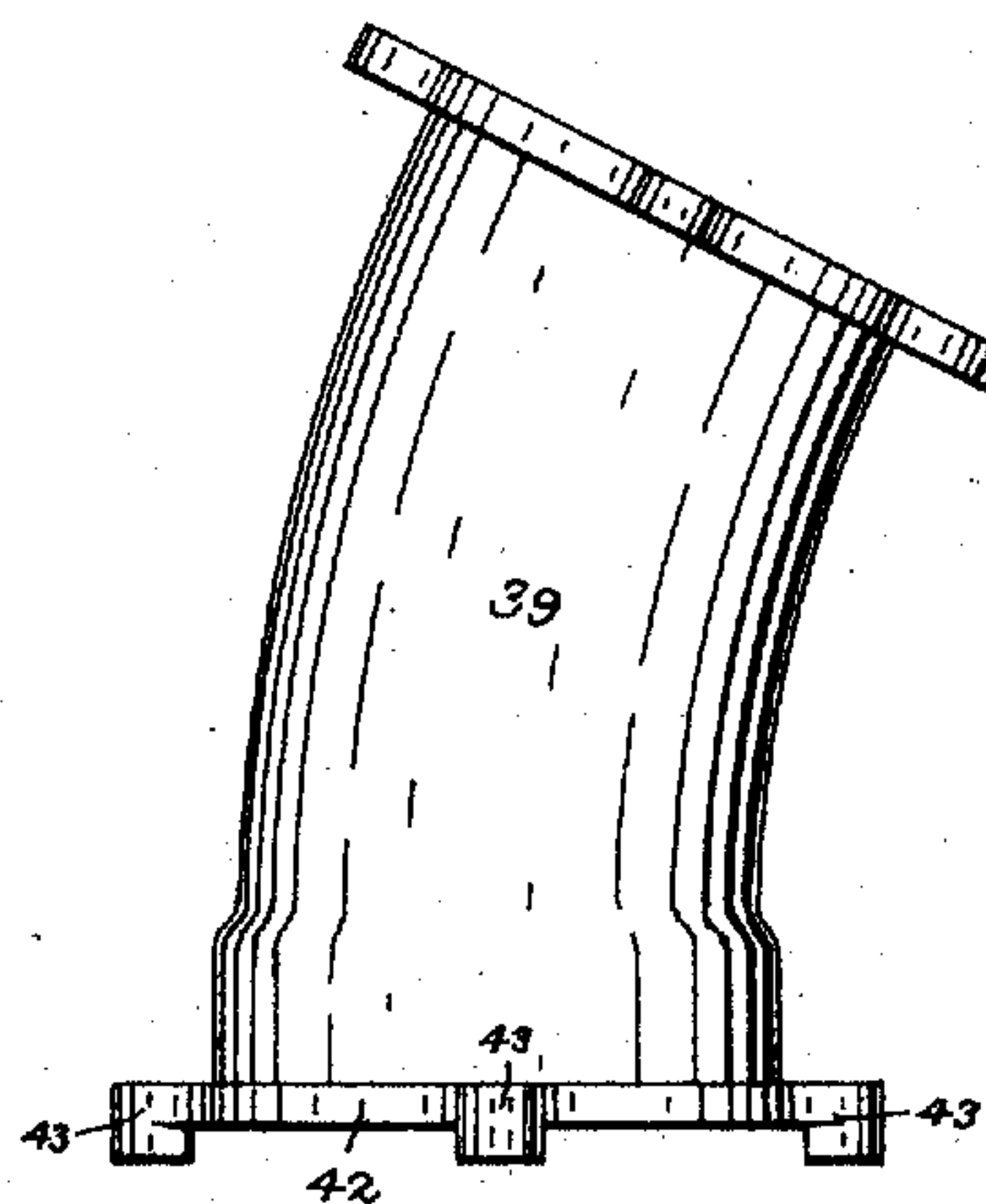


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANK G. HARRISON, OF MASSILLON, OHIO, ASSIGNOR TO WILLIAMSON R. HARRISON, OF MASSILLON, OHIO.

PNEUMATIC ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 687,960, dated December 3, 1901.

Application filed July 11, 1901. Serial No. 67,843. (No model.)

To all whom it may concern:

Be it known that I, FRANK G. HARRISON, a citizen of the United States, residing at Massillon, in the county of Stark and State of Ohio, have invented a new and useful Pneumatic Elevator, of which the following is a specification.

My invention relates to improvements in the construction of pneumatic elevators used for receiving the cut materials from a feed or fodder cutter and elevating the same to a silo or other receptacle and for other similar purposes; and the objects of my improvements are to make the elevator so that the working parts are readily accessible for inspecting and repairing, that a breaking of the parts can be quickly and economically remedied, and that the discharge-pipe can be directed to deliver the cut material at various points without moving the elevator. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the drive-pulley side; Fig. 2, an elevation of the opposite side, showing the feed-spout and discharge-pipe in section; Fig. 3, a vertical section on line 3-3, Figs. 1 and 2; Fig. 4, a detached view of a form of elbow for the discharge-pipe. Fig. 5 represents detached perspective views of the side plates and journal-bearing; and Fig. 6 represents detached perspective views of the shaft, hub, disk, and blade-brackets.

Similar numerals refer to similar parts throughout the drawings.

The elevator-case 1 is formed circular in side aspect and has concentric circular openings on both sides, leaving a periphery U-shaped in section, and projecting, preferably, upward from the case is the discharge-pipe 2, the outer side of which is tangent to the periphery of the case. The case 1 is closed on one side by the semicircular plates 3 and 4, having, respectively, peripheral flanges 5 and 6, by which they are attached to the case by bolts 7, and the opening on the opposite side of the case is reduced to proper diameter for the feed-opening 8 by the ring-plate 9, having a peripheral flange 10, by which it is attached to the case by bolts 11. The ring-plate 9 may be rendered unnecessary by forming

the opening on one side of the case small enough for a feed-opening; but I prefer to make the openings on both sides of the case of equal diameter, so the case can be fitted with the drive-pulley on either side and the feed-opening on the opposite side.

On the lower side plate 4 is formed or attached the lower half of the centrally-located journal-bearing 12, and the upper side plate 3 has the notch 13 fitting over the upper half of said bearing. The arms 14, 14^a, and 14^b, respectively, are attached at their inner ends to the lower side plate 4 by bolts 15, and at the juncture of their outer ends is formed or attached the journal-bearing 16.

In the journal-bearings 12 and 16 is mounted the fan-shaft 17, on which is attached outside the case the drive-pulley 18 and within the case the fan-hub 19. On the hub 19 is formed the annular flange 20, and extending beyond said flange is the collar 21. The disk 22 is attached on the collar side to the flange 20 by bolts 23, said disk having a central circular aperture 24 fitting around the collar 21. If desired, the collar extension 21 of the hub can be omitted, in which case the aperture 24 of the disk would correspond with the aperture of the hub and fit around the shaft 17.

A suitable number of blade-brackets 25 are attached to the side of the disk 22, preferably on the same side with the flange 20, by bolts 26. The blade-brackets 25 are formed, preferably, of two plates joined substantially at right angles with each other, of which the inner plate 27 is located against the side of the disk 22, and its inner edge 27^a is curved or shaped to fit against the periphery of the flange 20 of the hub, and the outer plate 28 extends on one side over and beyond the periphery of the disk 22, its inner edge 28^a fitting against said periphery. To the outer plate 28 are attached the fan-blades 29, or said bracket-plates may themselves be made large enough to form said blades. The latter is usually done in smaller-sized elevators; but in the larger sizes it is preferable to make malleable blade-brackets and rivet thereto sheet-metal blades, which is the arrangement illustrated.

To the side of the ring-plate 9 is attached the feed-spout shoe 30 by bolts 31, at the up-

per edge of which shoe projects outward and then upward the flange 32, forming the angular groove 33, in which rests the lower end of the feed-spout 34. The feed-spout 34 is
 5 attached to a suitable frame 35, which may be part of the frame of the machine in which the material to be elevated is cut, and the bottom 36 of the spout is preferably permanently attached to its sides, and its outer side and bot-
 10 tom are likewise attached to the flange 32 of the shoe; but the top or lid, or rather the lower section of the same, is formed separately and is put in place by inserting the lower end 37 in the groove 33, formed by the flange 32,
 15 and it is held securely against the upper edges of the sides by the cam-acting bolt 38, which bolt is pivoted to the frame 35.

By my construction the interior of the elevator-case can readily be reached for inspection or repair on the feed side by removing
 20 the top or lid of the feed-spout and on the pulley side by removing the upper side plate without disturbing any of the working parts. The several parts of the fan can then be separated and removed from the interior of the
 25 case without disturbing the shaft or its bearings, and the shaft and pulley can be removed by taking off the upper parts of the journal-bearings without disturbing the lower side
 30 plate or its attached arms. If any breakage occurs—as, for instance, should one of the bolts 15 break a piece out of the plate to which it is attached—the elevator-case, which would be difficult and expensive to replace or re-
 35 pair, is not affected.

The discharge-pipe 2 preferably terminates near the case 1 and is extended by an elbow 39 and an extension-pipe 40 any desired distance. Near the end of the discharge-pipe 2
 40 is formed externally the annular flange 41, on which rests a similar flange 42, formed on the lower end of the elbow 39, which lower end telescopes over the upper end of said discharge-pipe. A suitable number of lugs 43
 45 project outward from the flange 42 and downward past the periphery of the flange 41. Bolts 44 are passed upward through apertures 45 in said lugs, the heads of said bolts being formed L-shaped. By turning the bolts 44
 50 with the L-shaped heads inward to engage the lower side of the flange 41 the elbow 39 can be securely coupled to the discharge-pipe by tightening the bolt-nuts 47, or by loosening said nuts the elbow may be rotated on said
 55 discharge-pipe, and by turning said bolts with the L-shaped heads outward free from the flange 41 the elbow can be removed from said pipe. The extension-pipe 40 is attached to the upper end of the elbow 39 by the flange-
 60 coupling 48 or other suitable means. By rotating the elbow on the discharge-pipe the extension-pipe may be turned in any direction desired to reach the place of delivery.

The elbow 39 can be formed of one piece, 65 as illustrated in Fig. 4, or can be formed in two telescoping pieces 49 and 50, respectively, as shown in the other views. The telescop-

ing elbow is adjusted and secured in a desired position by the curved rod 51, attached to the elbow-piece 49, sliding in the curved sleeve 52, 70 attached to the elbow-piece 50, and a set-screw 53, turning through said sleeve against said rod, the rod and sleeve being curved concentric with the curve of the elbow and being located, preferably, on the outer side of the same, 75 by which adjustment of the telescoping elbow various inclinations can be given to the extension-pipe, and in connection with the rotation of the elbow on the discharge-pipe any desired point of delivery within the limits of 80 the telescoping adjustment can be reached by the extension-pipe, so that various silos or other receptacles can be filled without changing position of the elevator-case.

Having described my invention, what I 85 claim as new, and desire to secure by Letters Patent, is—

1. In a pneumatic elevator, a case, having circular openings in each side, separately-detachable semicircular plates closing one side 90 opening of said case, one of said plates having a centrally-located journal-bearing and the other a notch corresponding therewith, arms projecting from the former plate having a journal-bearing at the junction of their 95 outer ends, and a fan and pulley-shaft mounted in said journal-bearings, substantially as specified.

2. In a pneumatic-elevator fan, a shaft, a hub on said shaft having an annular flange, 100 a disk attached to said flange, and fan-blade brackets attached to said disk, substantially as specified.

3. In a pneumatic-elevator fan, a shaft, a hub on said shaft having an annular flange, 105 a collar extending from said hub and flange, a disk attached to said flange, there being a central aperture in said disk fitting said collar, and fan-blade brackets attached to said disk, substantially as specified. 110

4. In a pneumatic-elevator fan, a shaft, a hub on said shaft having an annular flange, a disk attached to said flange, and fan-blade brackets attached to said disk, the inner edges of said brackets being formed in contact 115 with the periphery of the flange, substantially as specified.

5. In a pneumatic-elevator fan, a shaft, a hub on said shaft having an annular flange, a disk attached to said flange, and fan-blade 120 brackets attached to said disk, an inner edge of each bracket being formed in contact with the periphery of said disk, substantially as specified.

6. In a pneumatic-elevator fan, a shaft, a 125 hub on said shaft having an annular flange, a disk attached to said flange, and fan-blade brackets attached to said disk, the inner edges of each bracket being formed respectively in contact with the peripheries of said 130 flange and disk, substantially as specified.

7. In a pneumatic-elevator feed-spout, a shoe, there being a groove along the edge of said shoe, a frame, the sides and bottom of

said spout being attached to each other, to said frame and in said groove, a removable lid engaging the groove at one end, and a cam-bolt pivoted to the frame securing said lid
5 near its other end, substantially as specified.

8. In a pneumatic elevator, a discharge-pipe having an annular flange near its outer end, an elbow telescoping over said end of the discharge-pipe having an external annu-
10 lar flange at its inner end fitting against the discharge-pipe flange, lugs projecting from the periphery of said elbow-flange engaging

the periphery of the discharge-pipe flange, and rotatable bolts having L-shaped heads passing through apertures in said lugs and
15 being adapted to engage the discharge-pipe flange substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK G. HARRISON.

Witnesses:

WARREN E. SLENTZ,
HARRIETT CONN.