

A. MESTITZ.
PUMP FOR VACUUM CLEANERS.

APPLICATION FILED APR. 15, 1907.

2 SHEETS—SHEET 1.

Fig. 1

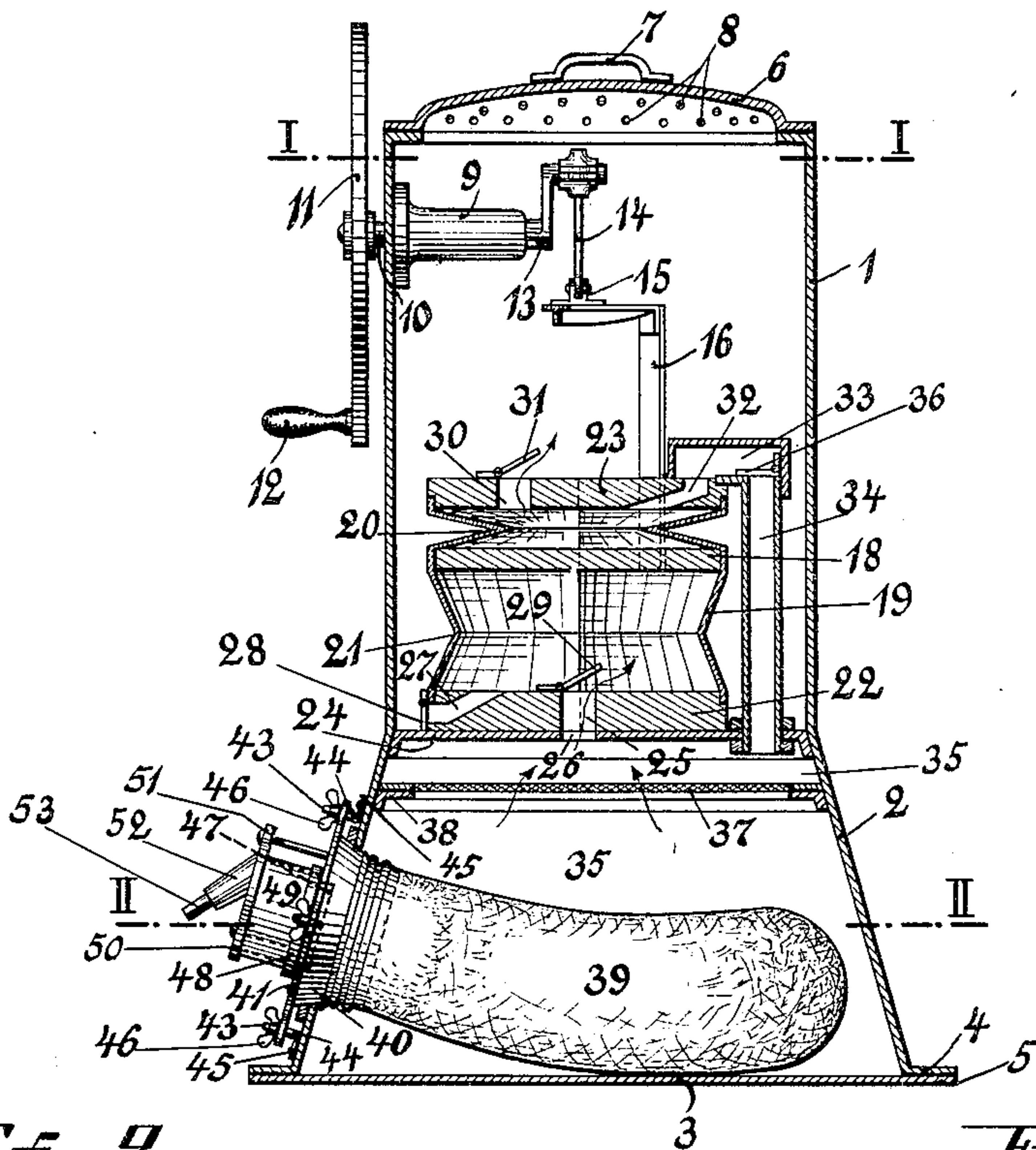


Fig. 2

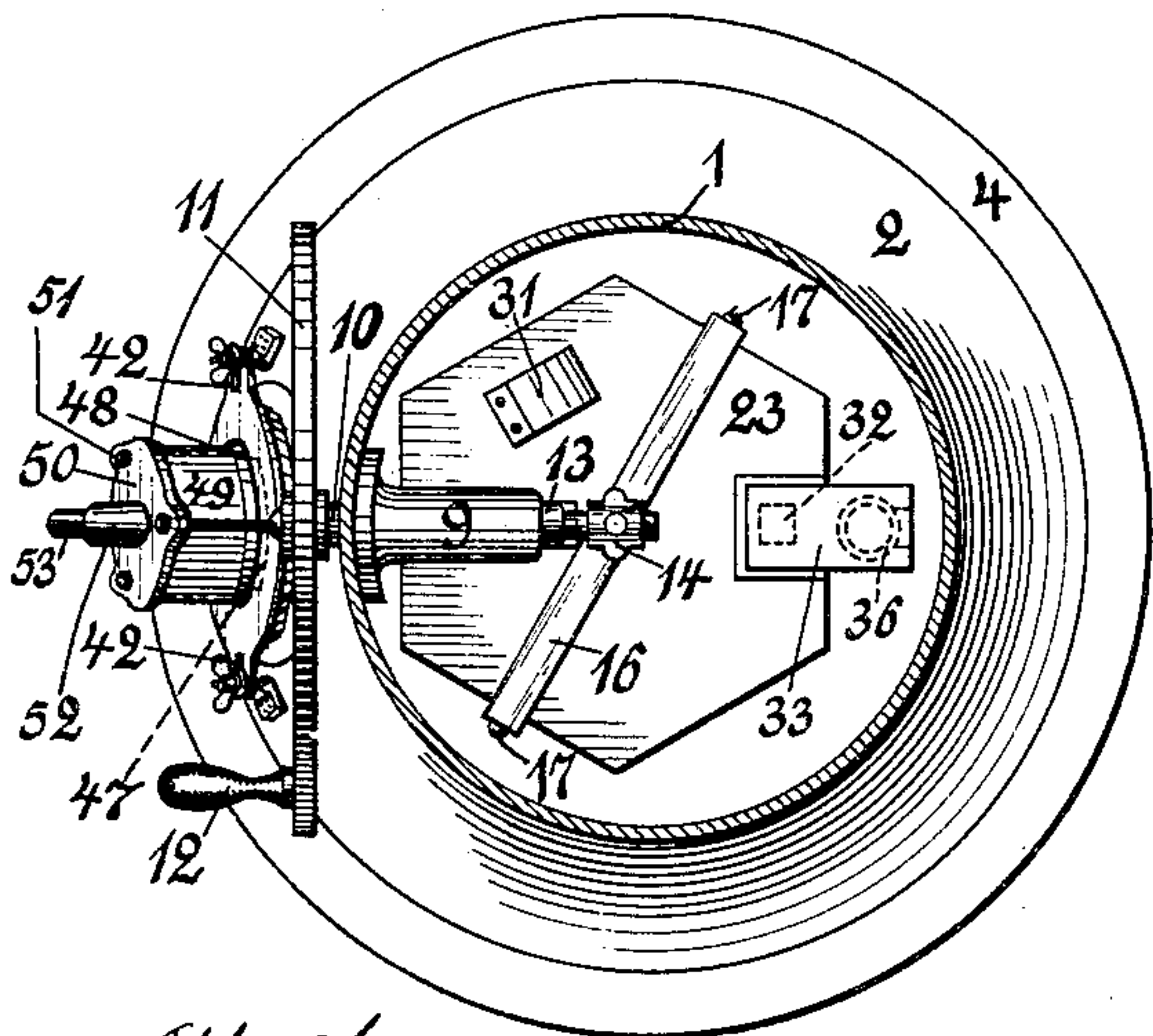
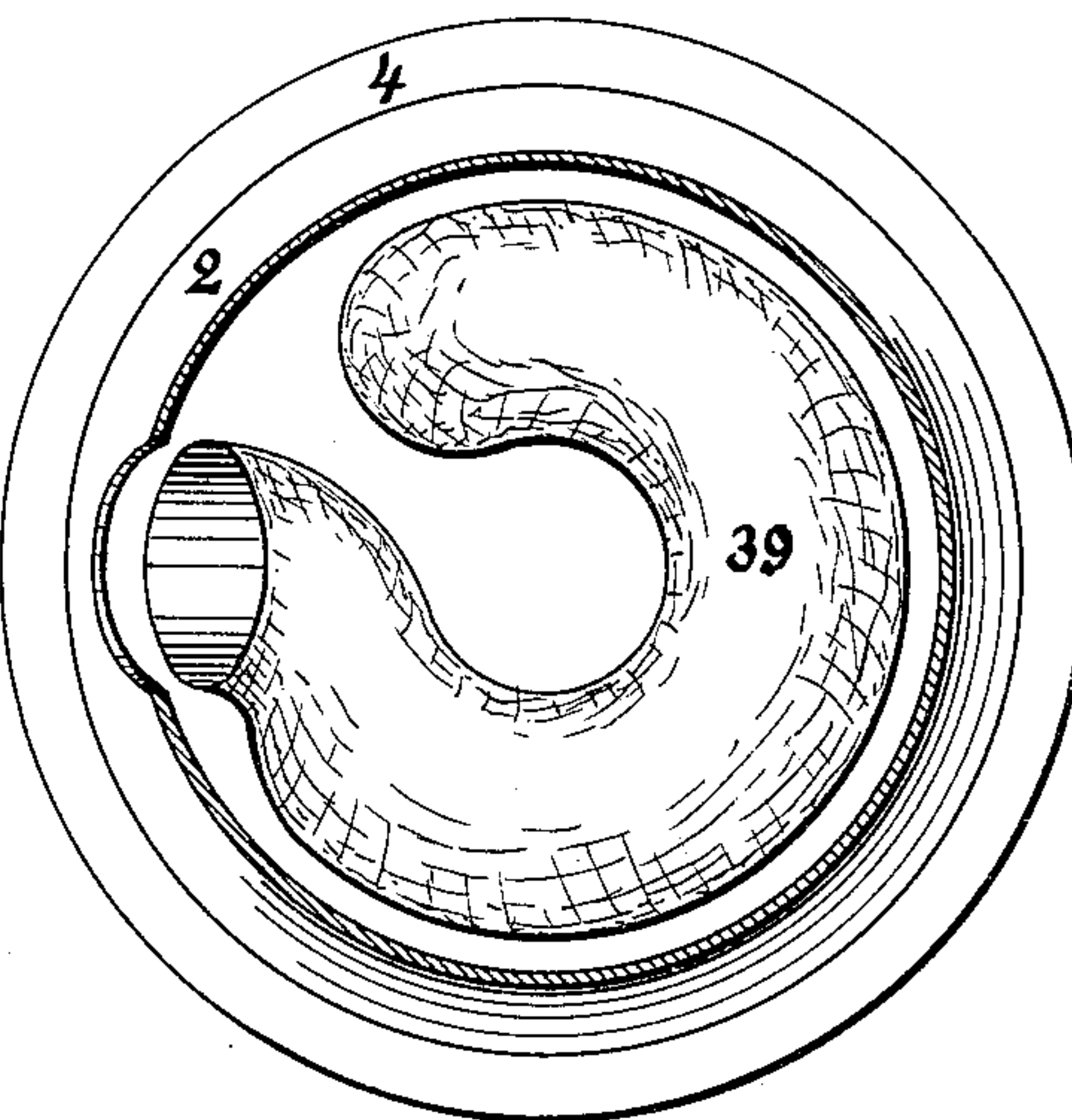


Fig. 3



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No. 875,446.

PATENTED DEC. 31, 1907.

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2 SHEETS—SHEET 2.

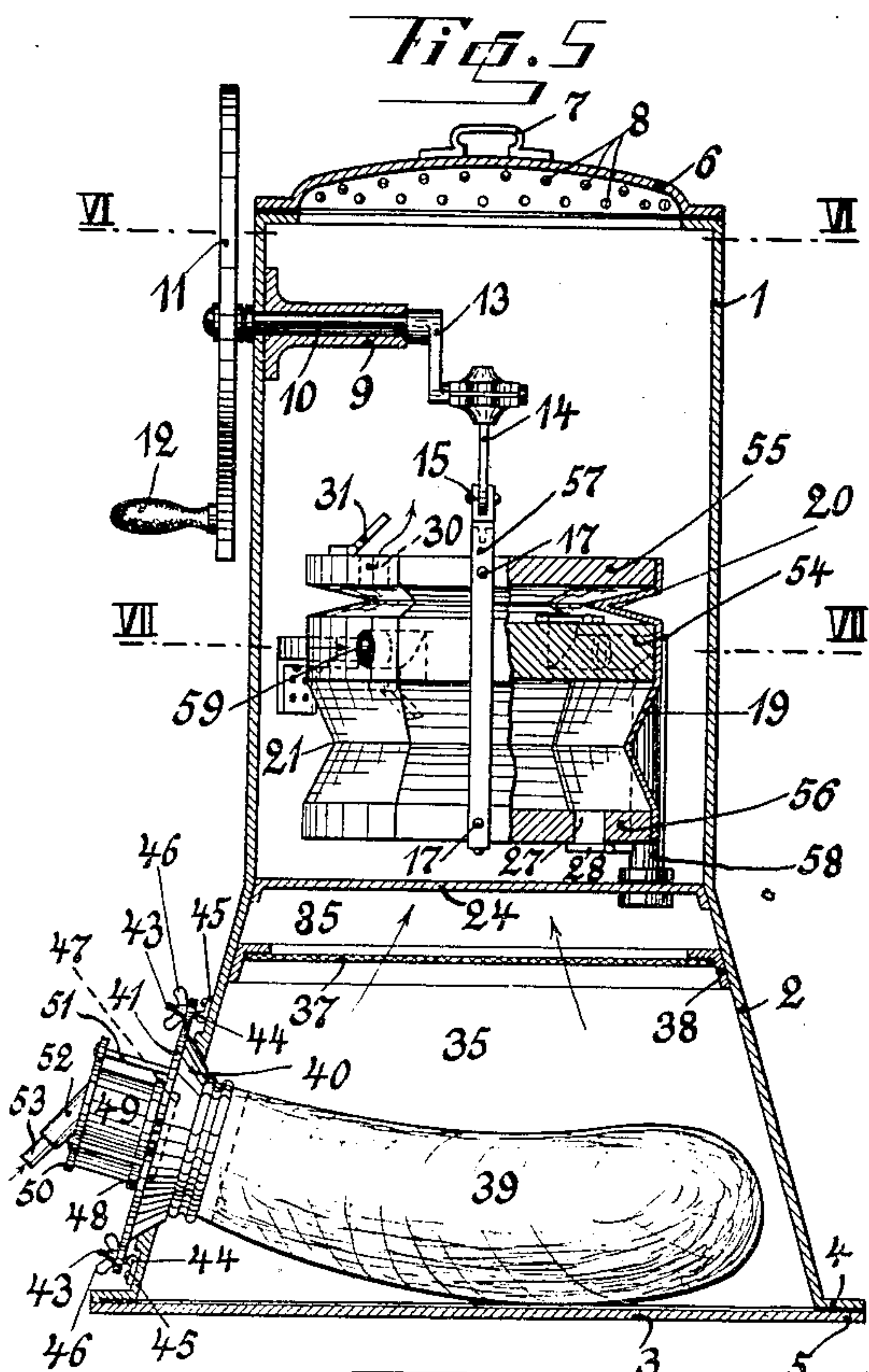


Fig. 5

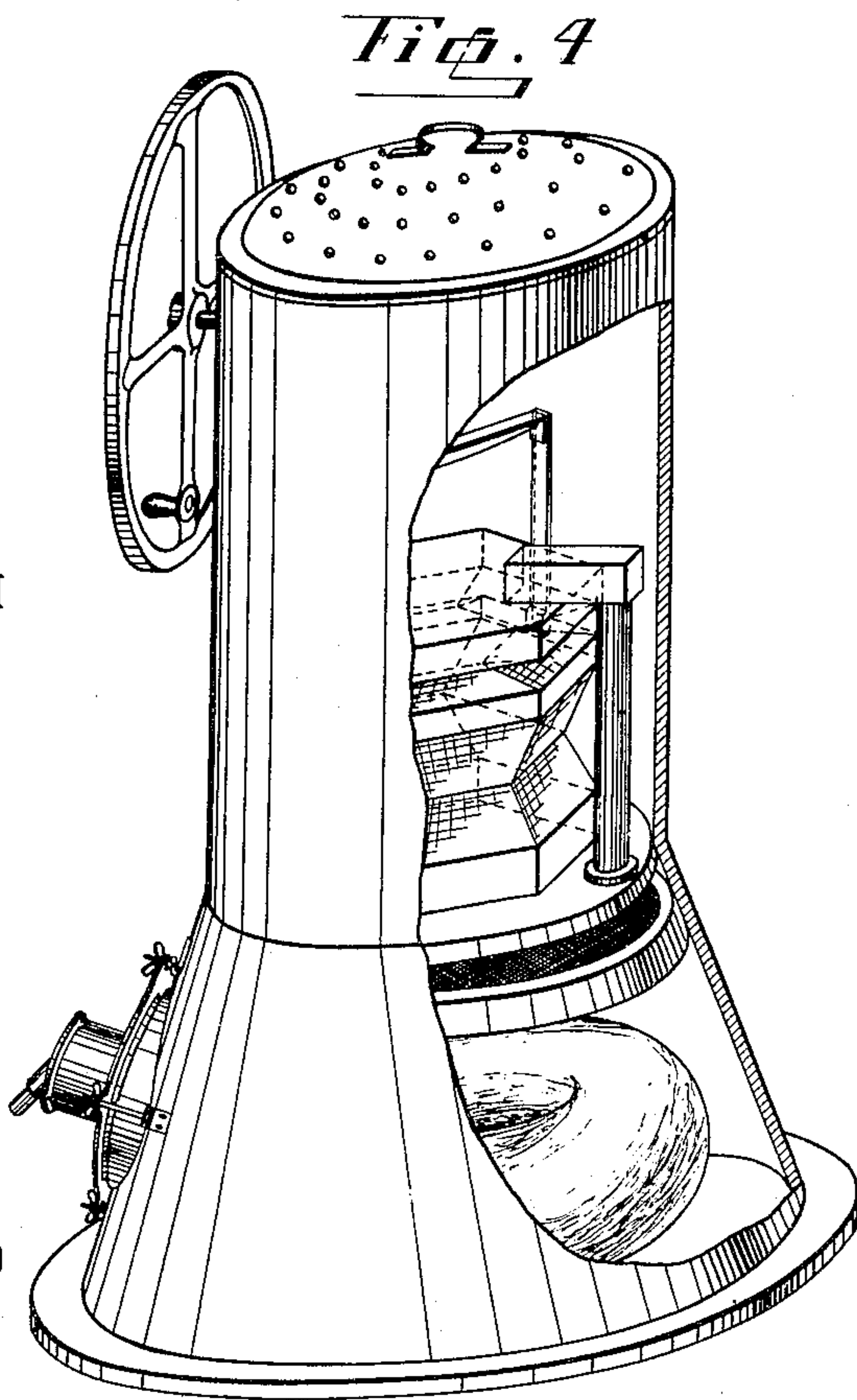


Fig. 4

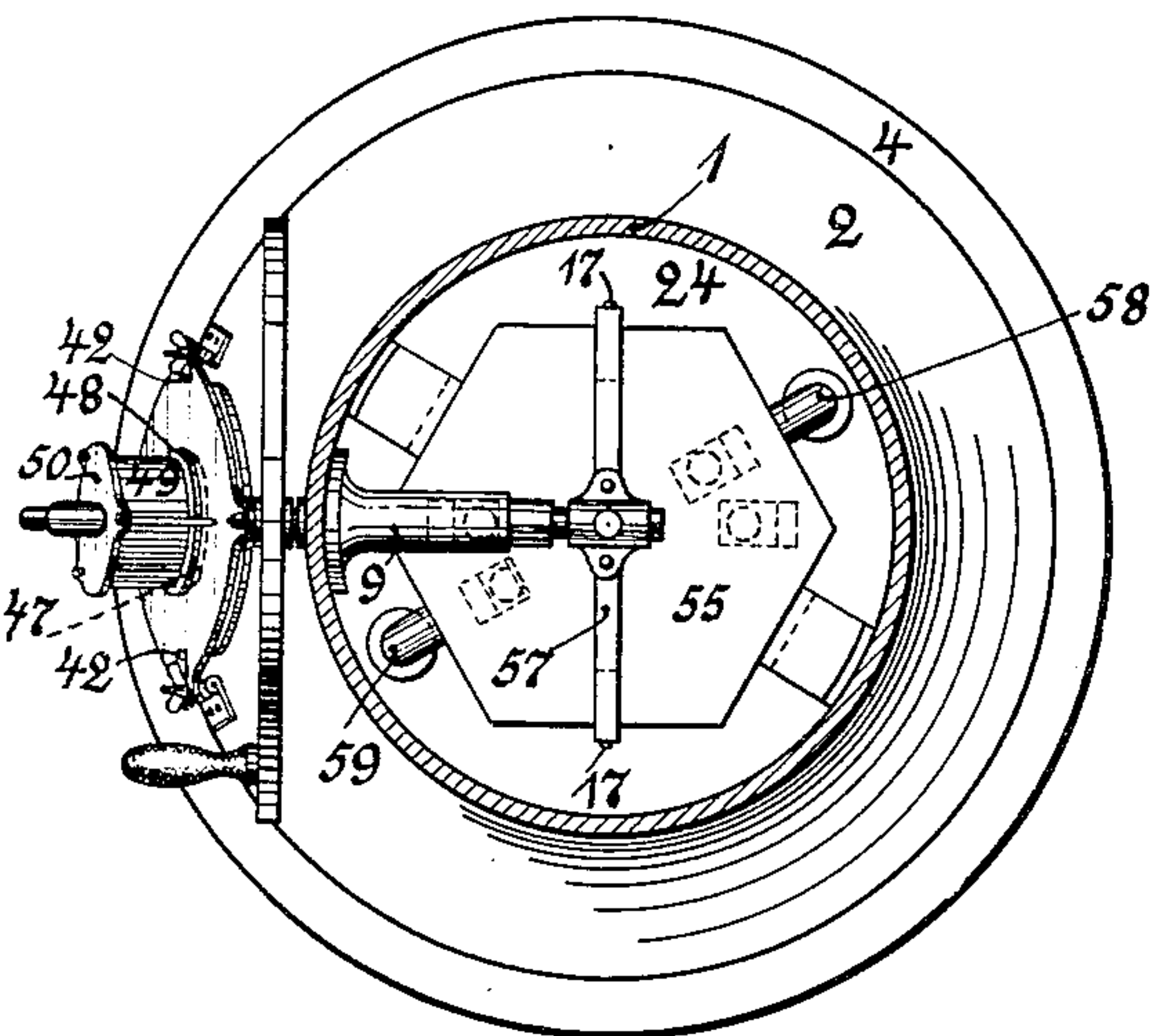


Fig. 6

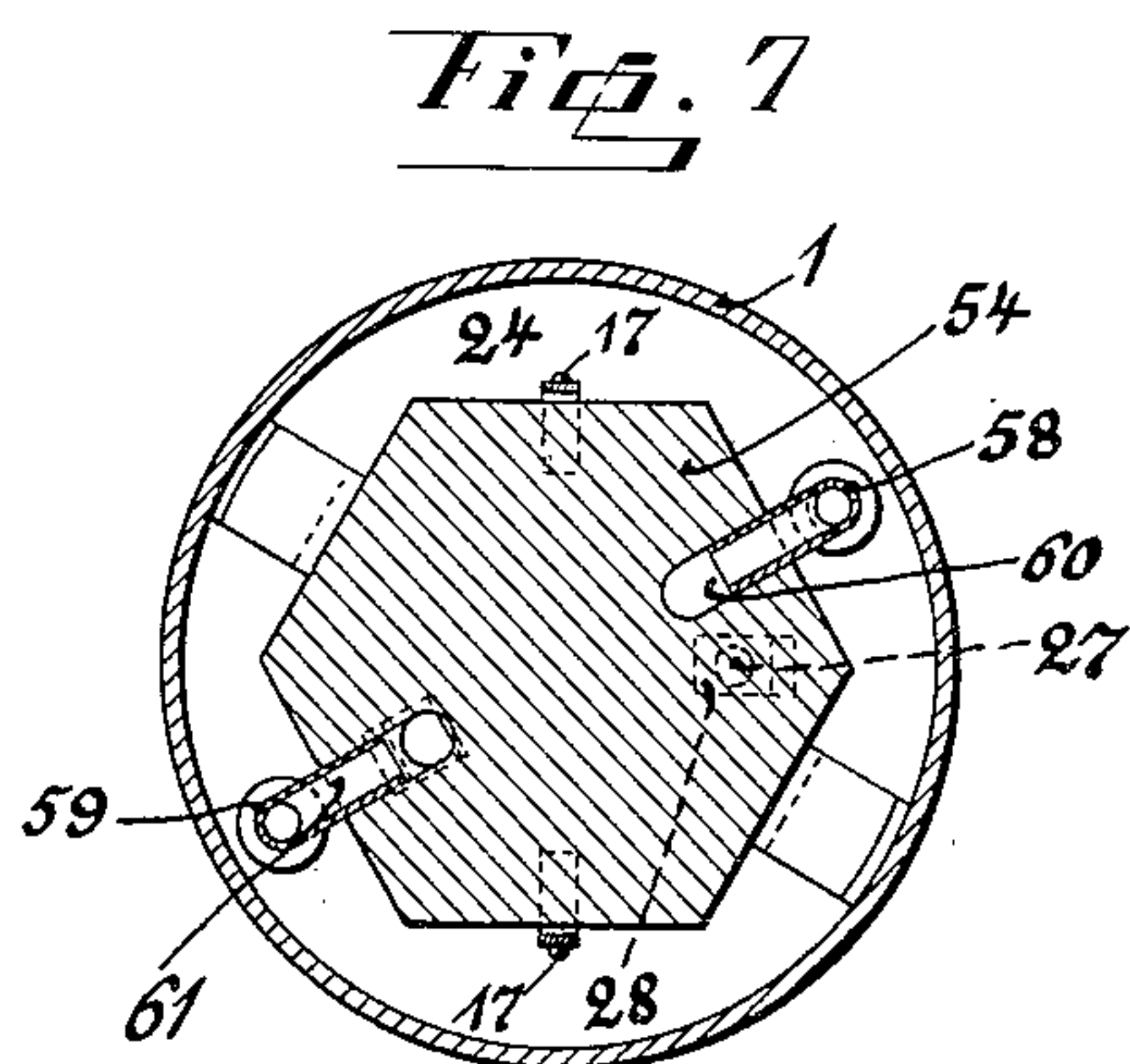


Fig. 7

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UNITED STATES PATENT OFFICE.

ARTHUR MESTITZ, OF RAUDNITZ, AUSTRIA-HUNGARY.

PUMP FOR VACUUM-CLEANERS.

No. 875,446.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed April 15, 1907. Serial No. 368,309.

To all whom it may concern:

Be it known that I, ARTHUR MESTITZ, engineer, a subject of the Emperor of Austria-Hungary, residing at Raudnitz-on-the-Elbe, Austria-Hungary, have invented new and useful Improvements in Pumps for Vacuum-Cleaners, of which the following is a specification.

My present invention relates to improvements in vacuum cleaners having bellows by which the air containing dust is removed by suction from the object to be cleaned and is conducted through a filtering apparatus.

My invention consists in a special form of the bellows, the same being provided with a movable board disposed between two fixed boards, said movable board having no valves or the like, while, on the other hand, both of the fixed boards have, an inlet and outlet opening for the air sucked in during the operation of the bellows, and valves to regulate the passage of the air through these openings. By this arrangement the efficiency of the apparatus is augmented in comparison with existing systems.

My invention also relates to a vacuum cleaner having bellows in which the middle board is fixed and two movable boards are rigidly connected together. The middle board has two channels adapted to be closed by valves or the like, both of said channels communicating with the air vessel of the dust sucking apparatus. One of these channels is in communication with the bellows underneath the fixed middle board while the other channel communicates with the other bellows.

In the accompanying drawing several constructions of my improved vacuum cleaners are shown by way of example:

Figure 1 is a vertical section of one construction, Fig. 2, a horizontal section on the line I—I of Fig. 1, Fig. 3, a horizontal section on II—II of Fig. 1, and Fig. 4, an elevation of the apparatus shown in Fig. 1, a part of the casing being broken out, Fig. 5 represents another construction of my apparatus in vertical section, Fig. 6 is a horizontal section on the line VI—VI of Fig. 5, and Fig. 7, a vertical section on VII—VII of Fig. 5.

Similar parts are designated by the same letters throughout the several views.

Referring to Fig. 1 the vacuum apparatus shown therein consists of a cylindrical casing 1 of sheet metal or other material, provided with a conical base 2, which serves as a suc-

tion chamber. This base is closed by an airtight bottom 3 which is secured to the flange 4 by bolts or rivets passed through said flange 4 and the edge 5 of the bottom 3, a packing ring of rubber or other suitable material being provided between 4 and 5. The bottom 3 can however be secured to the base 2 in any other suitable manner. The casing 1 is closed at the top by a lid 6 having a handle 7 and perforations 8, through which the air issuing from the bellows or pump escapes. To the casing 1 a bearing 9 is secured by screws or in any other suitable manner. In this bearing 9 is journaled a shaft 10, at one end of which the fly-wheel 11 is fastened, said fly-wheel being provided with a handle 12. On the opposite end of the shaft 10 is fixed a crank 13, by the rotation of which a connecting rod 14 is moved. This rod 14 is connected by a link 15 with a fork 16, the free end of which is fastened by screws 17 or in any other suitable manner with a horizontal movable board 18. To said board is secured the leather bellows 19 of a proximately cylindrical form, which forms two folds 20, 21 and is closed at both ends by the fixed boards 22, 23. The board 22 is rigidly fastened to the plate 24 secured to the casing 1 or to the base 2 and said board is provided with a channel or passage 25 corresponding with an opening 26 in the plate 24. In the board 22 is also provided a channel 27, which opens out into the space inclosed by the casing 1, a valve 28 being provided over said opening, which automatically closes the channel 27. A valve 29 serves to close the channel 25. The top board 23 has a channel 30, which can be closed by a valve 31 having the tendency to automatically close. The board 23 is also provided with the channel 32, which is in communication with a chamber 33 connected by the pipe 34 with the suction chamber 35 inclosed by the base 2. A valve 36 is adapted to cut off communication between the chamber 33 and the pipe 34 as explained below. In the chamber 35 is provided a filter cloth 37 of textile fabric or metal threads, this cloth being fastened to an angle iron 38 fixed to the base 2.

I place a filtering apparatus in the chamber 35 which consists of a sack 39 made of some close fabric. The open end of this sack is tightly fastened to a ring 40 carrying an oval plate 41. This plate is provided with slots 42 into which can be turned the bolts 43 jointed at 44 with the lug 45 secured to the

base 2. By screwing down the thumb screws 46 the plate 41 and the conical ring 40 are pressed firmly into the opening in the base 2, in which the ring 40 fits. When it is desired to remove the sack 39 the screws 46 are somewhat loosened and the bolts 43 are turned down out of the slots in the plate 41, whereupon this plate together with the ring 40 and the sack 39 connected thereto can be taken out of the apparatus. The sack is then emptied and put into the apparatus again.

The circular plate 41 has an opening 47, over which is provided a sight glass 49 held in a mounting 48. Said sight glass is kept in position by a circular plate 50, through which pass bolts 51 fastened to the plate 41. The plate 50 is provided with an opening surrounded by the pipe socket 52, which ends in a spout 53, to which is connected a hose pipe leading to the objects to be cleaned and provided at the end with the usual mouth piece.

The operation of the apparatus described is as follows: By turning the fly wheel 11 by means of the handle 12 the fork-frame 16 is moved up and down. As a consequence the movable board 18 is also reciprocated, so that the air containing the dust passes through the hose pipe into the socket 52 and from thence through the sight glass 49 into the sack 39. In this sack the dirt, dust, etc., carried in by the air are deposited and the air thus filtered passes in the direction of the arrows through the filter cloth 37 and from thence through the opening 36 into the channel 25 because the valve 29 is open. When the board 18 is lowered said valve 29 will be closed, while the valve 28 will be opened and the air previously sucked in will be expelled through the channel 27 into the casing 1, from which it escapes through the perforations 8 into the atmosphere. While the board 18 is descending the fold 20 is extended, so that the valve 31 is closed and 36 is opened. As a consequence air passes

through the pipe 34 and the channel 32 into said bellows. As soon as the board 18 rises again the valve 36 will be closed and 31 will be opened so that the air in the upper part of the bellows will escape into the casing 1, as shown by the arrow.

The construction shown in Fig. 5, 6 and 7 is analogous to that described above and only differs by the board 54 being fixed and the two boards 55 and 56 being fastened together by a fork 57 and adapted to be moved up and down together.

The plate 24 has two openings for the pipes 58 and 59. One of these pipes connects the suction chamber 35 with the passage 60, which communicates with the fold 20 of the bellows. The other pipe 59 is in communication with the fold 51 through the passage 61.

What I claim and desire to secure by Letters Patent of the United States is:

A pump for a vacuum cleaner, comprising in combination a casing, the lower part of which serves as a suction chamber, a movable board reciprocated between two fixed boards, leather bellows secured to a movable board forming only two folds and closed at both ends by the fixed boards, means for reciprocating the movable board, comprising a crank, a connecting rod and a fork-frame, connected by a link with the connecting rod and attached to the movable board, and a plate closing the suction chamber against the part of the casing containing the bellows, which plate has openings communicating with the air inlet-valves of the bellows, substantially as, and for the purpose set forth.

In witness whereof I have hereunto signed my name this 29 day of March, 1907, in the presence of two subscribing witnesses.

ARTHUR MESTITZ.

Witnesses:

ADOLPH FISCHER,

ARTHUR SCHWEINBURG.