

No. 772,617.

PATENTED OCT. 18, 1904.

C. J. JEPPESEN.
CENTRIFUGAL MILK HEATER.

APPLICATION FILED MAR. 10, 1904.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.

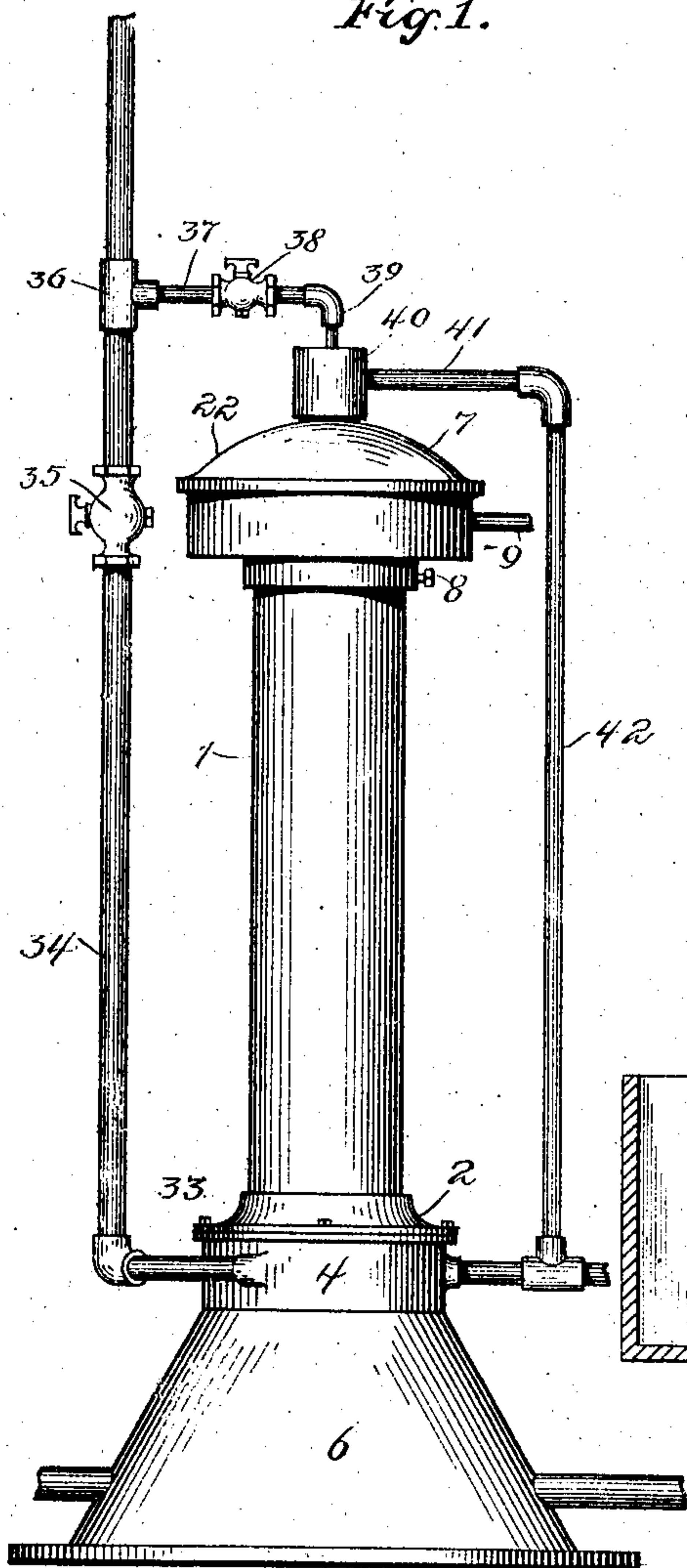


Fig. 2.

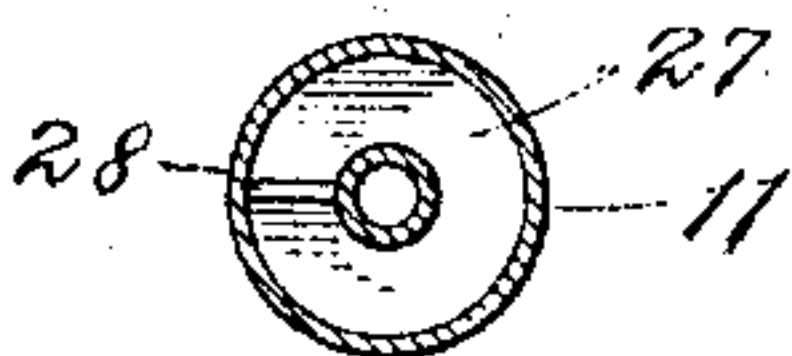
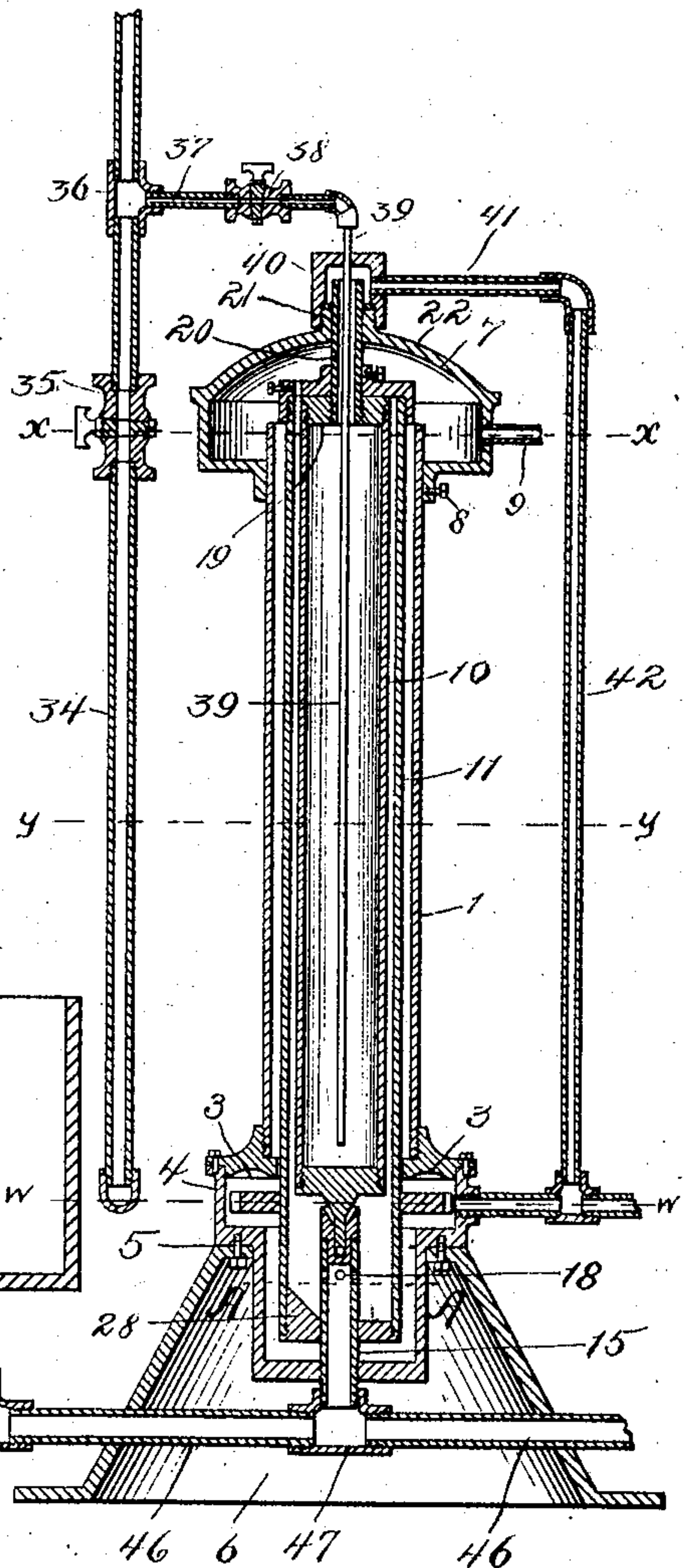


Fig. 3.

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Fig. 4.

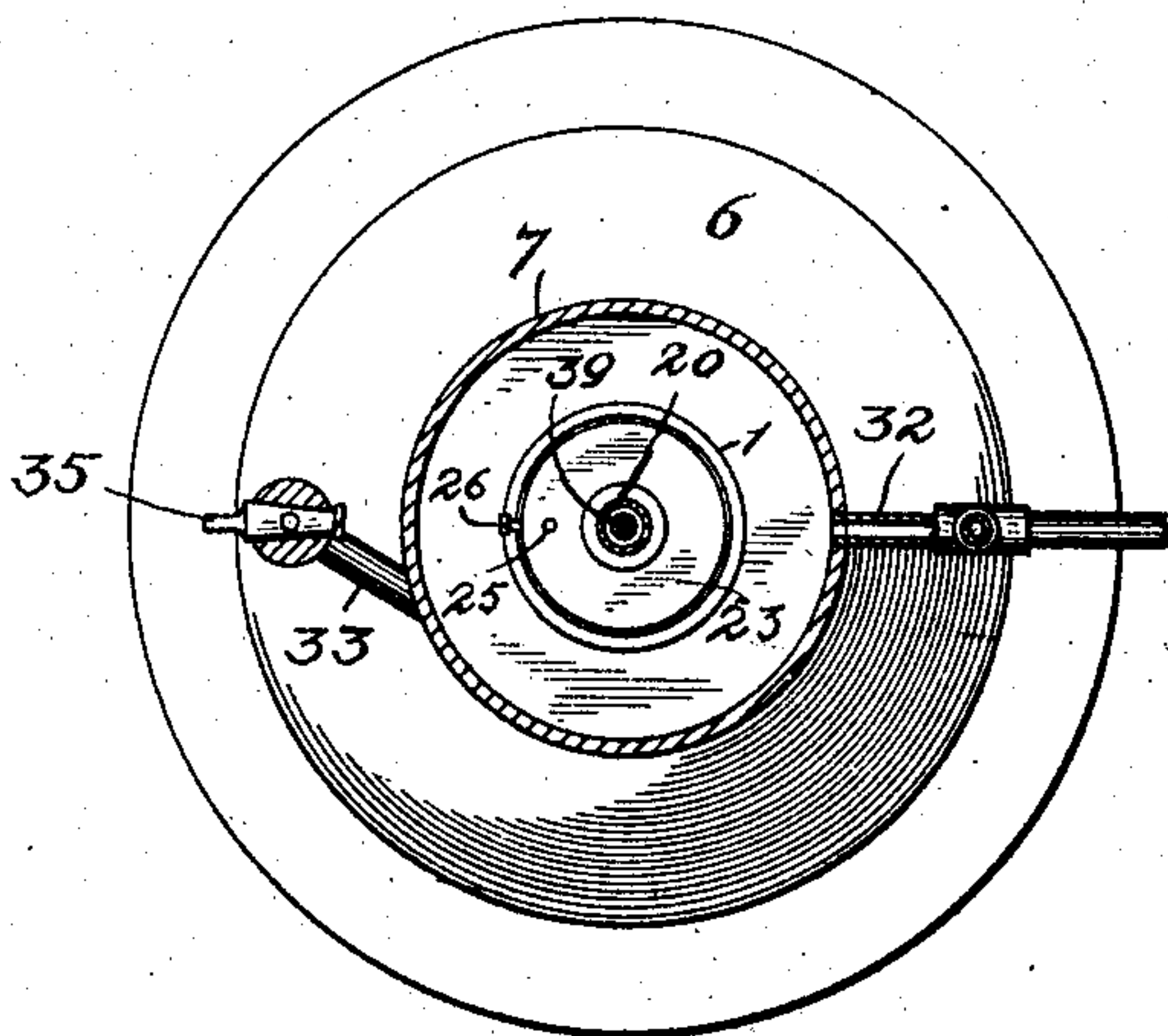


Fig. 5.

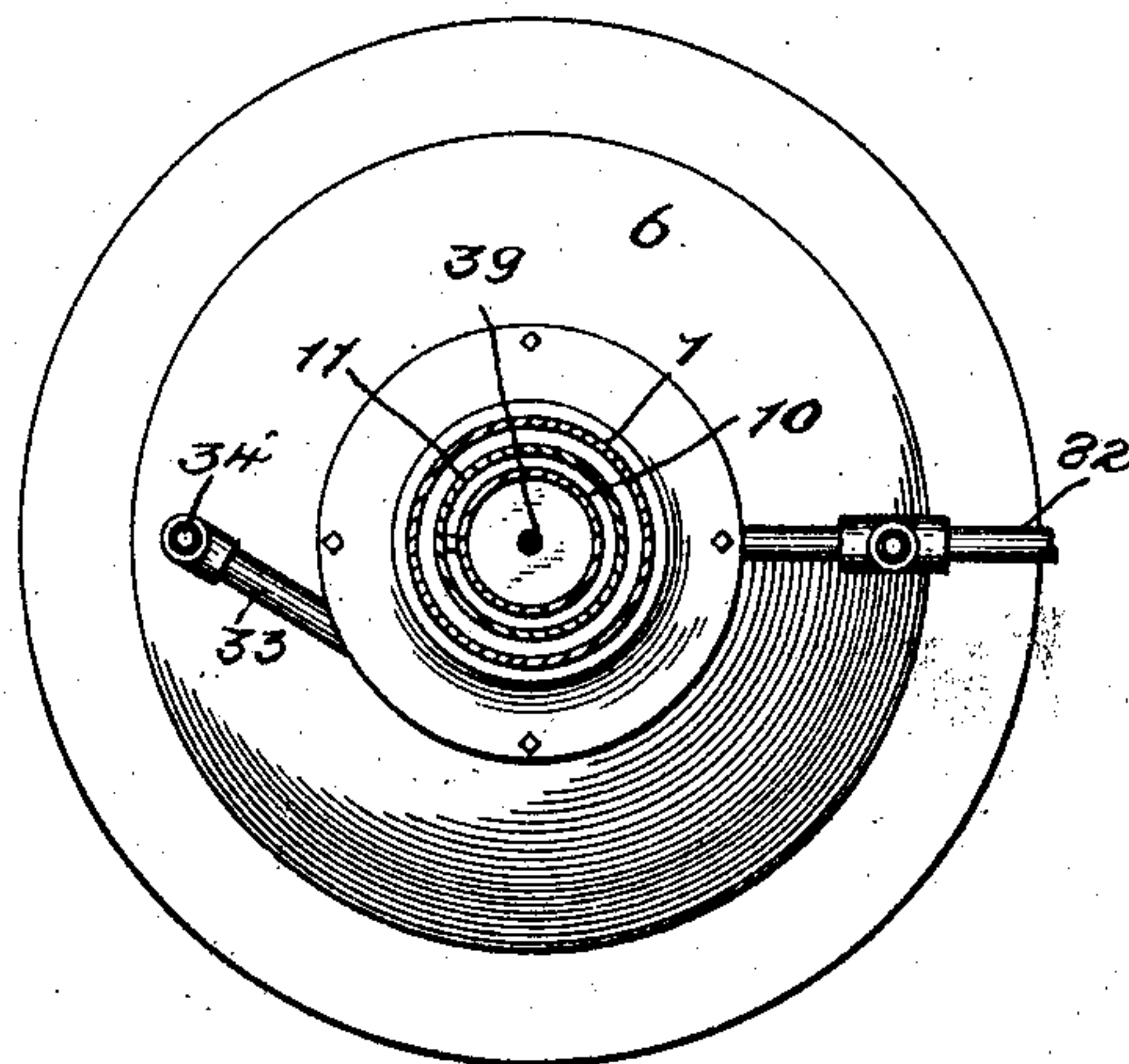


Fig. 6.

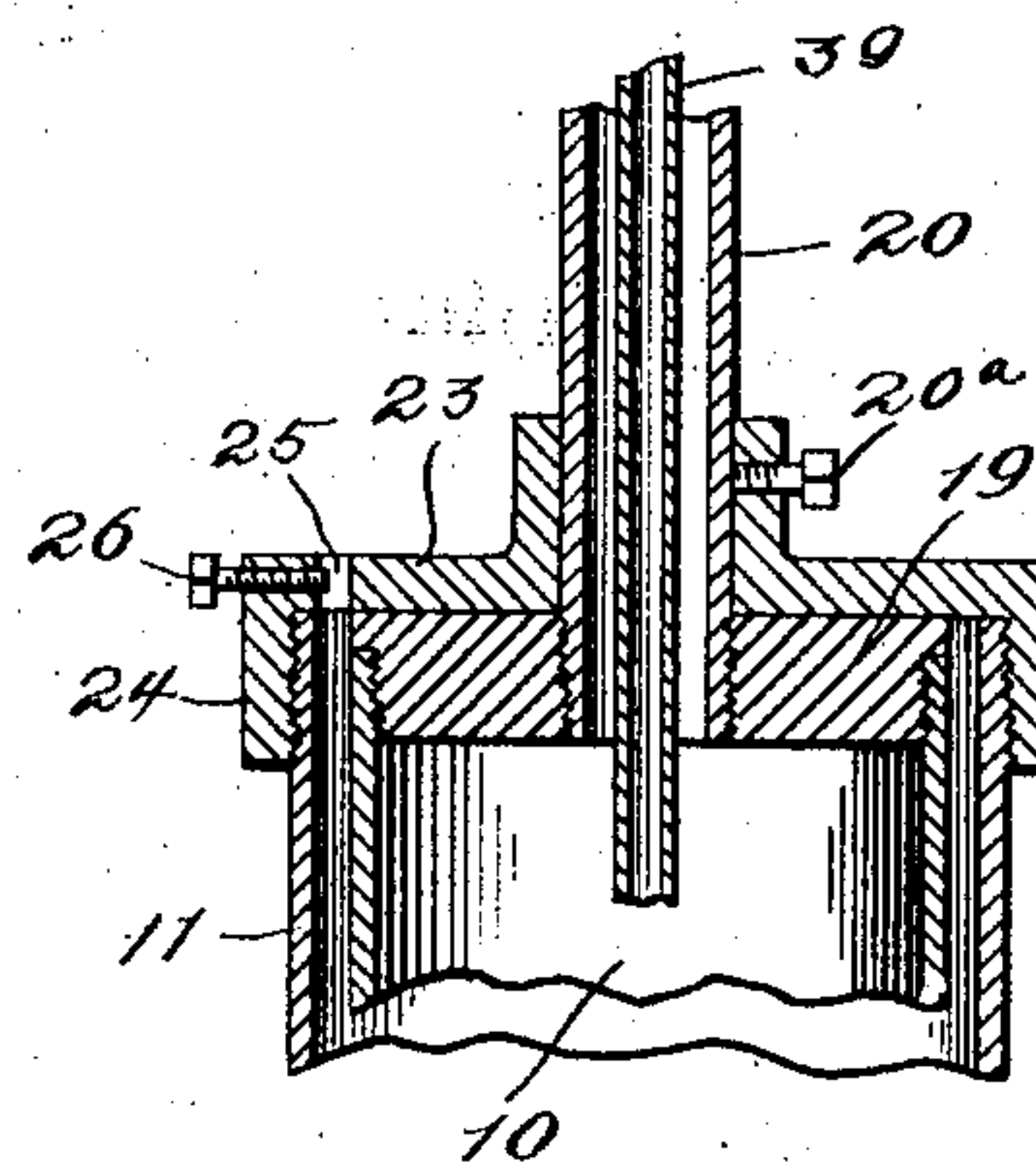
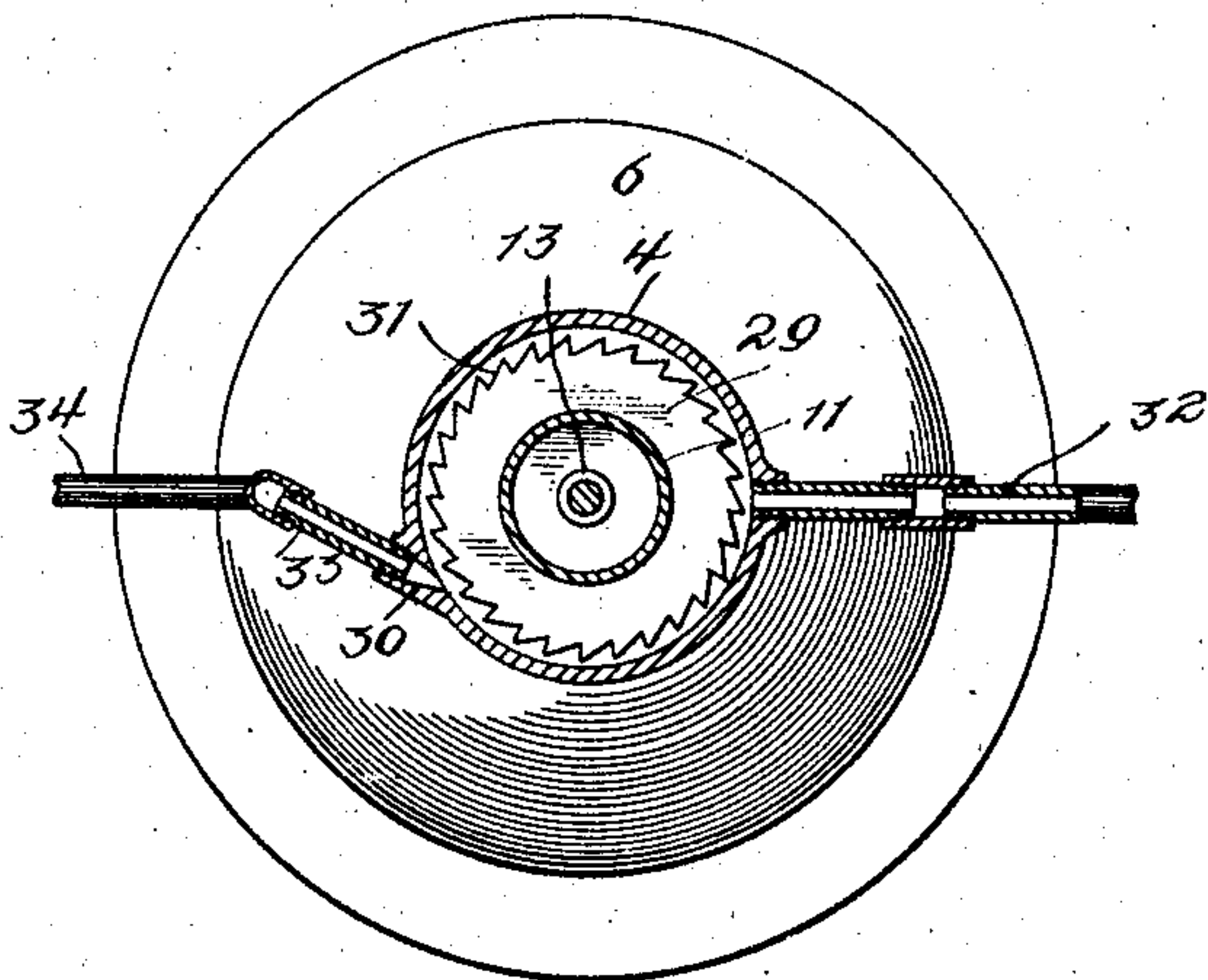


Fig. 7.

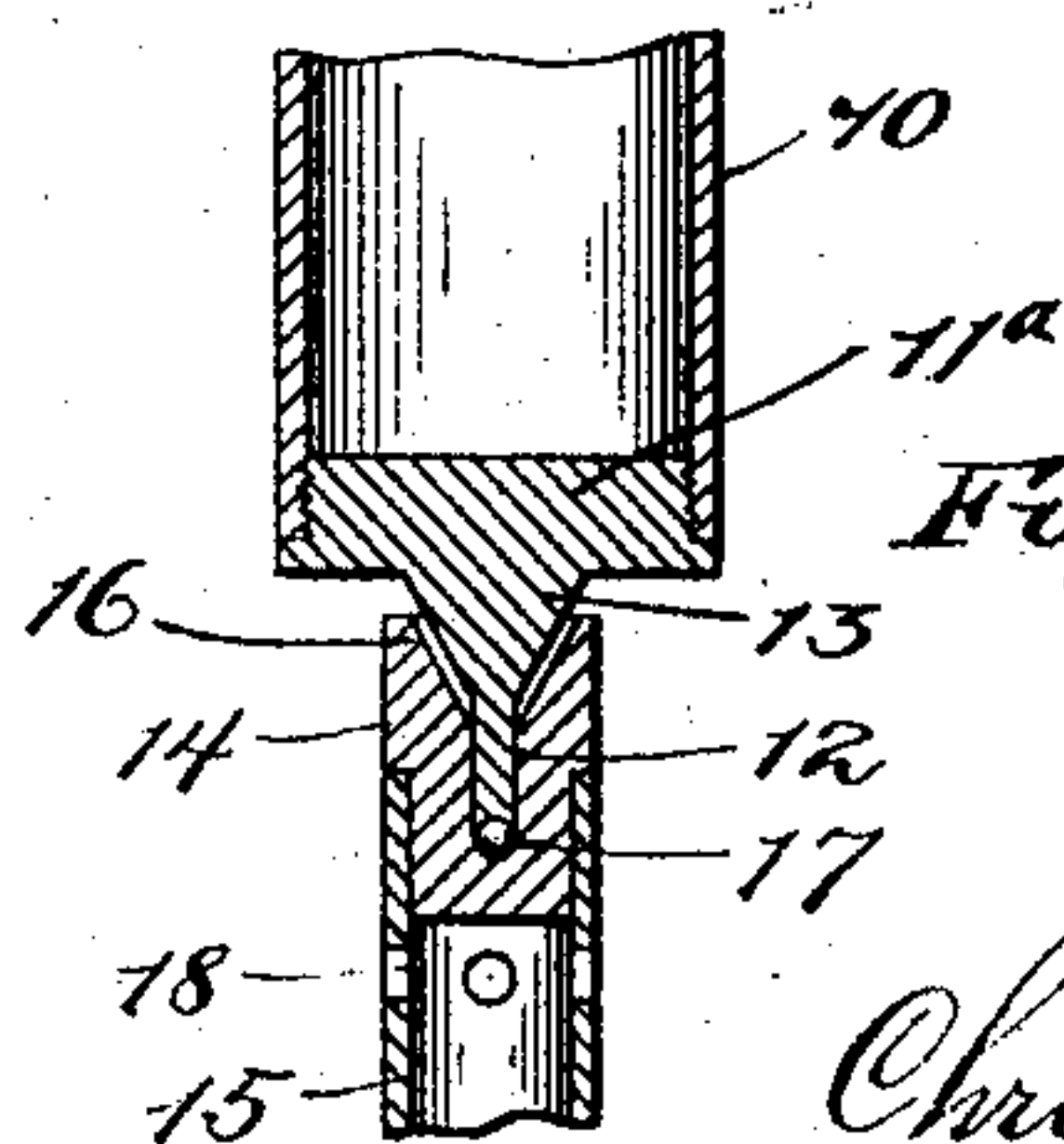


Fig. 8.

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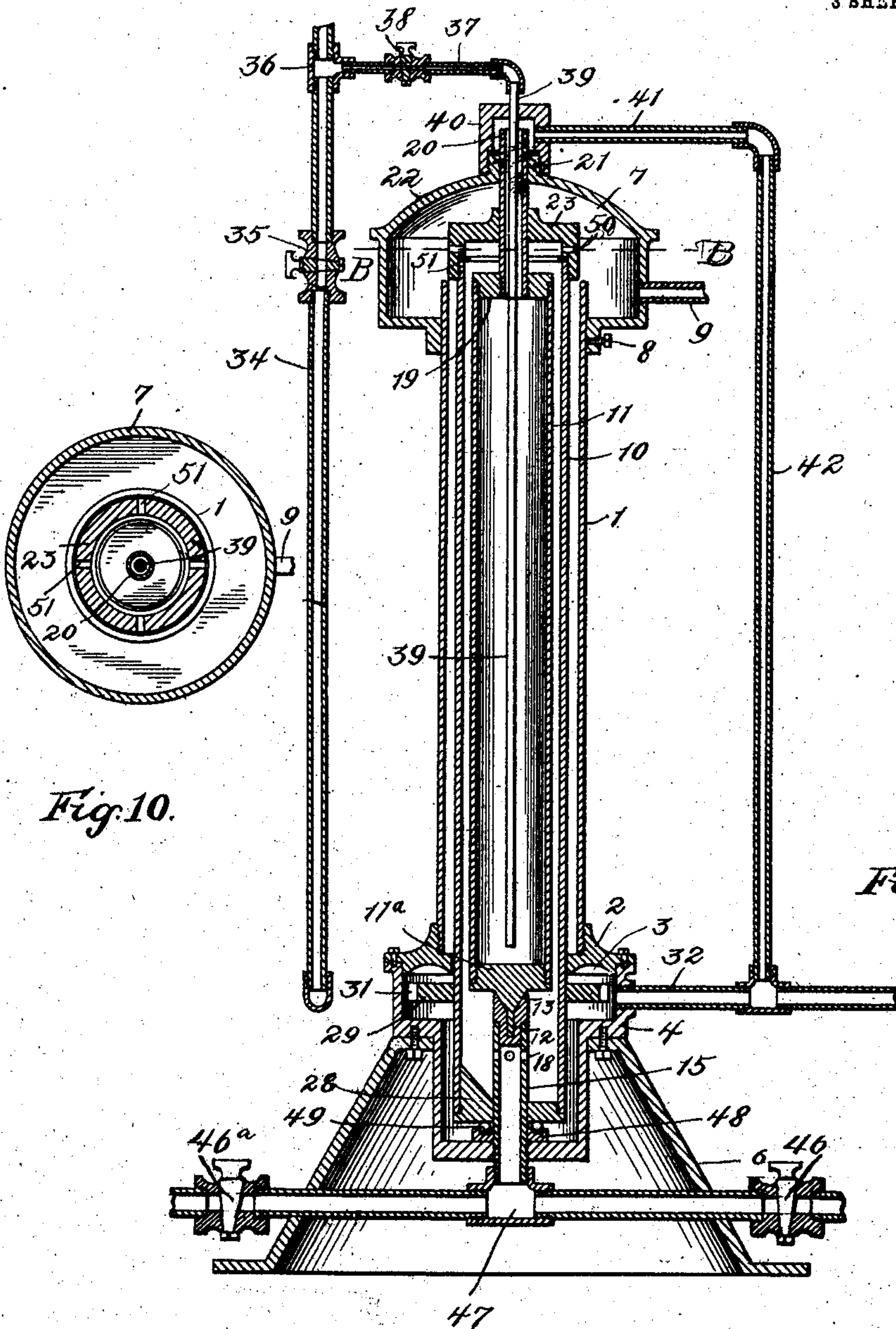
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3 SHEETS—SHEET 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHRISTEN JOHN JEPPESEN, OF CENTERBURG, OHIO.

CENTRIFUGAL MILK-HEATER.

SPECIFICATION forming part of Letters Patent No. 772,617, dated October 18, 1904.

Application filed March 10, 1904. Serial No. 197,455. (No model.)

To all whom it may concern:

Be it known that I, CHRISTEN JOHN JEPPESEN, a citizen of the United States, residing at Centerburg, in the county of Knox and State of Ohio, have invented a certain new and useful Improvement in Centrifugal Milk-Heaters, of which the following is a specification.

My invention relates to an improvement in centrifugal milk-heaters.

The object of the invention is to provide a device of the character described that will thoroughly heat the milk to the desired degree and one which will be strong, durable, and efficient and the working parts of which will not be liable to get out of order.

With the above and other objects in view the invention consists of the novel details of construction and operation, a preferable embodiment of which is described in the specification and illustrated in the drawings, in which—

Figure 1 is an elevation of the heater. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a transverse sectional view of the outer cylinder, taken on the line A A of Fig. 2. Fig. 4 is a transverse sectional view taken on line *xx* of Fig. 2. Fig. 5 is a transverse sectional view taken on line *yy* of Fig. 2. Fig. 6 is a transverse sectional view taken on line W W of Fig. 2. Fig. 7 is a detailed vertical sectional view of the upper portions of the cylinders. Fig. 8 is detailed vertical sectional view of the portions of the inner cylinder and the supply, showing the bearing for the cylinder. Fig. 9 is a vertical sectional view of a slightly-modified form of heater, and Fig. 10 is a transverse sectional view taken on line B B of Fig. 9.

In the drawings the numeral 1 designates the casing, which is screw-threaded at its lower end to a collar 2, having a channel 3 in its under surface and an annular recess around its edge, by which it is secured upon the upper portion of the housing 4 by suitable means. The housing is formed with a shouldered portion 5, which rests upon the top of a conical base 6 and to which it is removably secured. A discharge-reservoir 7 is supported about

the upper end of the casing 1 by a set-screw 8 and is provided with a discharge-pipe 9.

Within the casing 1 inner and outer cylinders 10 and 11 are rotatably supported. The inner cylinder 10 is provided with a screw-threaded bottom 11^a, formed with a downwardly-projecting bearing-leg 12, having the conical upper portion 13. A bearing-block 14, supported in the upper end of the tube 15, is formed with a flaring bearing-aperture 16, adapted to receive a ball 17 in its lower end, upon which rests and bears the end of the leg 12. The tube 15 is provided with discharge-openings 18 and screw-threaded through the bottom of the housing 4, as will be hereinafter more fully described.

A bearing-disk 19 is threaded in the upper end of the cylinder, flush therewith, and supports from a threaded opening in its center a tube 20, which passes through a boss 21, formed on the dome-shaped roof 22 of the reservoir 7. A threaded cap 23 bears on the disk 19 around the tube 20, to which it is secured by a set-screw 20^a, and is formed with an annular collar 24, which is threaded on the outside of the cylinder 11, supporting the same. The cap 23 is formed with an aperture 25, having a diameter equal to width of the space between the cylinders positioned over said space and controlled by a set-screw 26, arranged at right angles thereto and adapted to stand any desired distance across the aperture 25 to regulate the position of the column of milk between the cylinders. The outer cylinder is formed with a threaded bottom 27, rotating around the tube 15, provided with one or more integral wings 28, adapted to stir up the milk when the cylinder is rotated.

Fixed to the outside of the cylinder 11 is a flutter-wheel 29, rotating within the housing 4. The wheel 29 is rotated by steam or the like issuing from the tangentially-disposed jet 30 and impinging its teeth 31, then exhausting through the pipe 32. The steam is supplied to the jet 30 through the branch pipe 33 and vertical pipe 34, the latter having a suitable cut-off cock 35 and provided with a T-union 36, from which extends the branch

pipe 37, having the cock 38. The branch pipe 37 extends to the center of the device, at which point it is connected to a vertical pipe 39, passing down through the nut-cap 40, 5 screwed on the boss 21, and through the tube 20 into the cylinder 10, terminating just short of its bottom 11^a for the purpose of conveying live steam into the inner cylinder 10 to heat the same. The steam rises in the 10 cylinder, passes through the tube 20 into the nut-cap 40, from which it escapes by way of the pipes 41 and 42 to the exhaust-pipe 32.

Milk is supplied to the heater from one or more vats 43, having their bottoms 44 on a 15 level with the ports 18 of the stem 15 and connected thereto by the pipes 45 and 46, the latter passing through the base and connected to the stem 15 by the T-union 47. I may employ one or two vats and provide cut-off 20 cocks 46^a in the pipes 46 outside of the base 6.

Steam being supplied to the pipe 34 is conveyed to the inner cylinder 10 by way of the pipes 37 and 39 to thoroughly heat the same. The greater portion of the steam is forced 25 down the pipe 34 and through the branch 33 to the jet 30, from which it is ejected in a needle stream against the teeth 31, causing the wheel 29 to rotate, thus revolving the cylinders 10 and 11. Milk having been de- 30 posited in the vat 43 seeking its own level rises in the stem 15 and sprays out through the ports 18 into the bottom of the revolving outer cylinder 11, where it is stirred up by the wings 28 and set in centrifugal motion, 35 causing it to rise in a column between the two cylinders 10 and 11 to the cap 23. Owing to the centrifugal action, the column of milk will tend to stand against the outer cylinder 11 out of contact with the wall of the 40 inner heating cylinder 10. The milk passes through the aperture 25 (see Fig. 7) in the cap 23 into the reservoir 7 and out of the pipe 9, having been thoroughly heated. The degree to which the milk is heated is regulated by the proximity of its path to the inner 45 cylinder 10. Referring to Fig. 7, it will be seen that the aperture 25 is controlled by a set-screw 26, and the column of milk may be moved toward or away from the cylinder 10 through the screw 26, which upon being 50 screwed in moves the column toward the cylinder 10, thus increasing the degree of heat, while upon being screwed out moves the column away from the cylinder 10, thus decreasing the heat. 55

It is apparent that the column of milk is thoroughly heated by the cylinder without being brought into contact with the same or the heating agent.

60 In Figs. 9 and 10 I have shown a slightly-modified construction in which the device is used as a sterilizer and the inner cylinder 10 is held against revolution. In order to ac-

complish this, the ball 17 is removed, allowing the leg to set down in the bearing and the 65 conical portion 13 to wedge in the flaring portion 16 of the bearing, thus locking the cylinder against rotation. This leaves the outer cylinder unsupported, so a bearing- 70 ring 48 is placed on the bottom of the housing 4, around the tube 15, and supports on balls 49 the bottom of the outer cylinder. I have also shown a slightly-different form of means for regulating the column of milk. 75 Instead of providing the cap 23 with a single vertical aperture 25 I form it with a plurality of horizontally-disposed ducts 50, through which the milk is radiated, and for regulating the position of the column I use rings 51, 80 seated on the upper end of the outer cylinder 11 and held in place by the cap 23. These rings have bores of different diameters, thus varying their length of projecting over the space between the cylinders, and thus regulating the position of the column of milk. 85 The other parts of the device remain unchanged and the operation is the same.

I do not wish to limit myself to the exact details of construction and operation, as I may make various changes in the same with- 90 out departing from the spirit of my invention.

Having now fully described my invention, what I claim, and desire to secure by Letters 95 Patent, is—

1. In a device of the type set forth, a heating agent, means for elevating a liquid past the heating agent without contacting with the same, and means for regulating the proximity of the liquid to the heating agent and 100 varying the degree to which the liquid is heated.

2. A device of the type set forth, a receptacle supplied with a heating agent, a heating-cylinder surrounding the receptacle, means 105 for supplying a liquid to the cylinder, means for revolving the cylinder, and means for regulating the position of the liquid with relation to the cylinder and the receptacle.

3. The combination with a casing, of a re- 110 ceptacle supplied with a heating agent, a cylinder surrounding the receptacle, means for feeding a liquid to the cylinder, means carried by the cylinder for agitating the liquid, means for rotating the cylinder for elevating 115 the liquid past the heating-receptacle without contacting with the same, means for regulating the proximity of the column of liquid with relation to the cylinder and receptacle, and a reservoir carried by the casing at its 120 upper end.

CHRISTEN JOHN JEPPESEN.

In presence of—

C. H. BISHOP,

O. E. LANDACRE.