

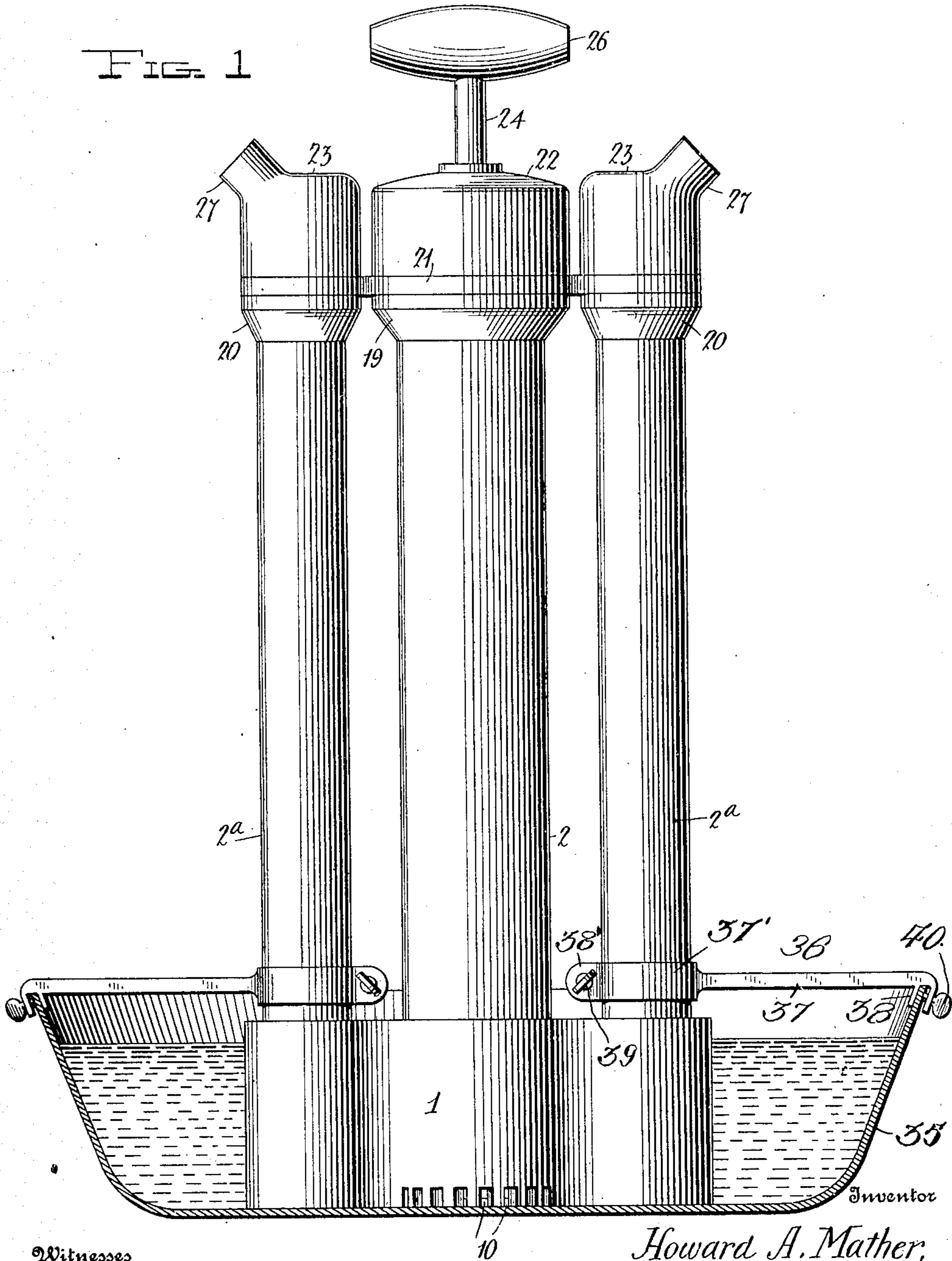
H. A. MATHER.
SYRINGE.

APPLICATION FILED AUG. 2, 1907. RENEWED AUG. 11, 1908.

916,177.

Patented Mar. 23, 1909.

2 SHEETS—SHEET 1.



Witnesses

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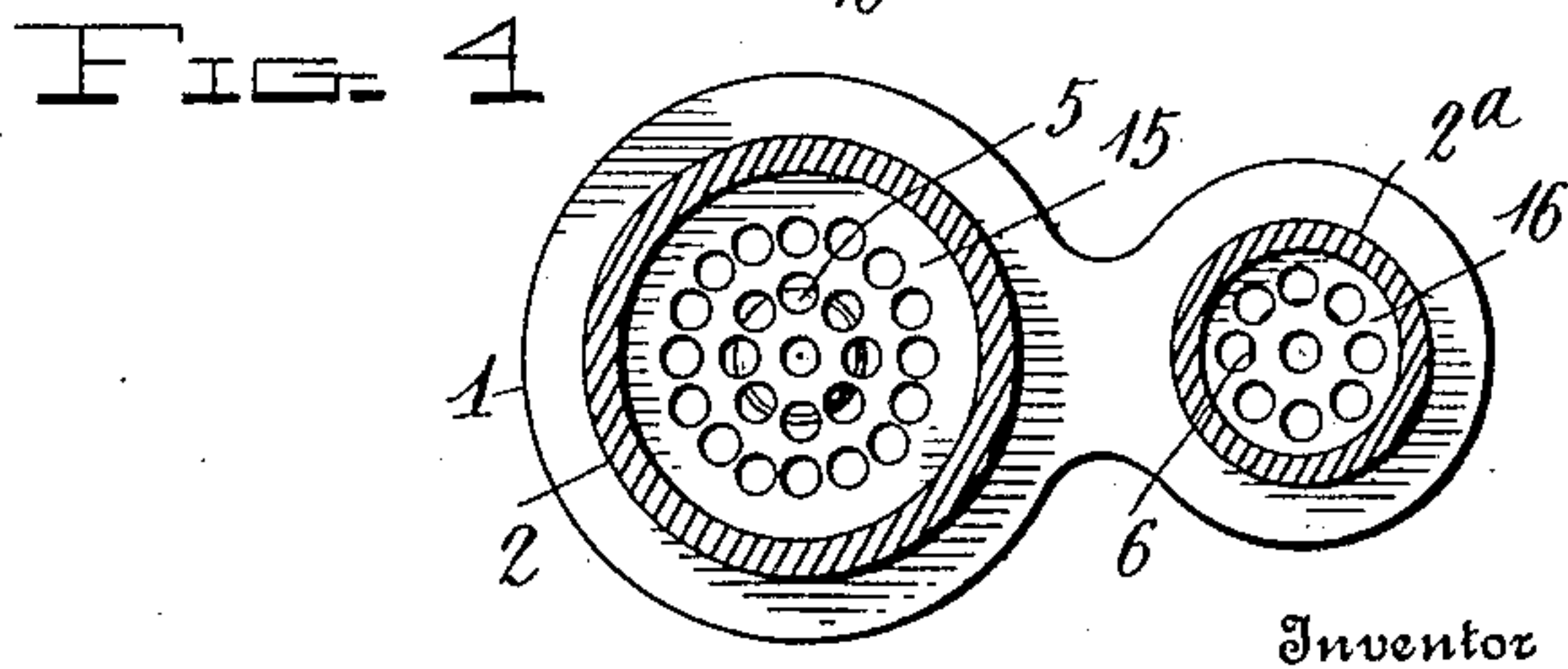
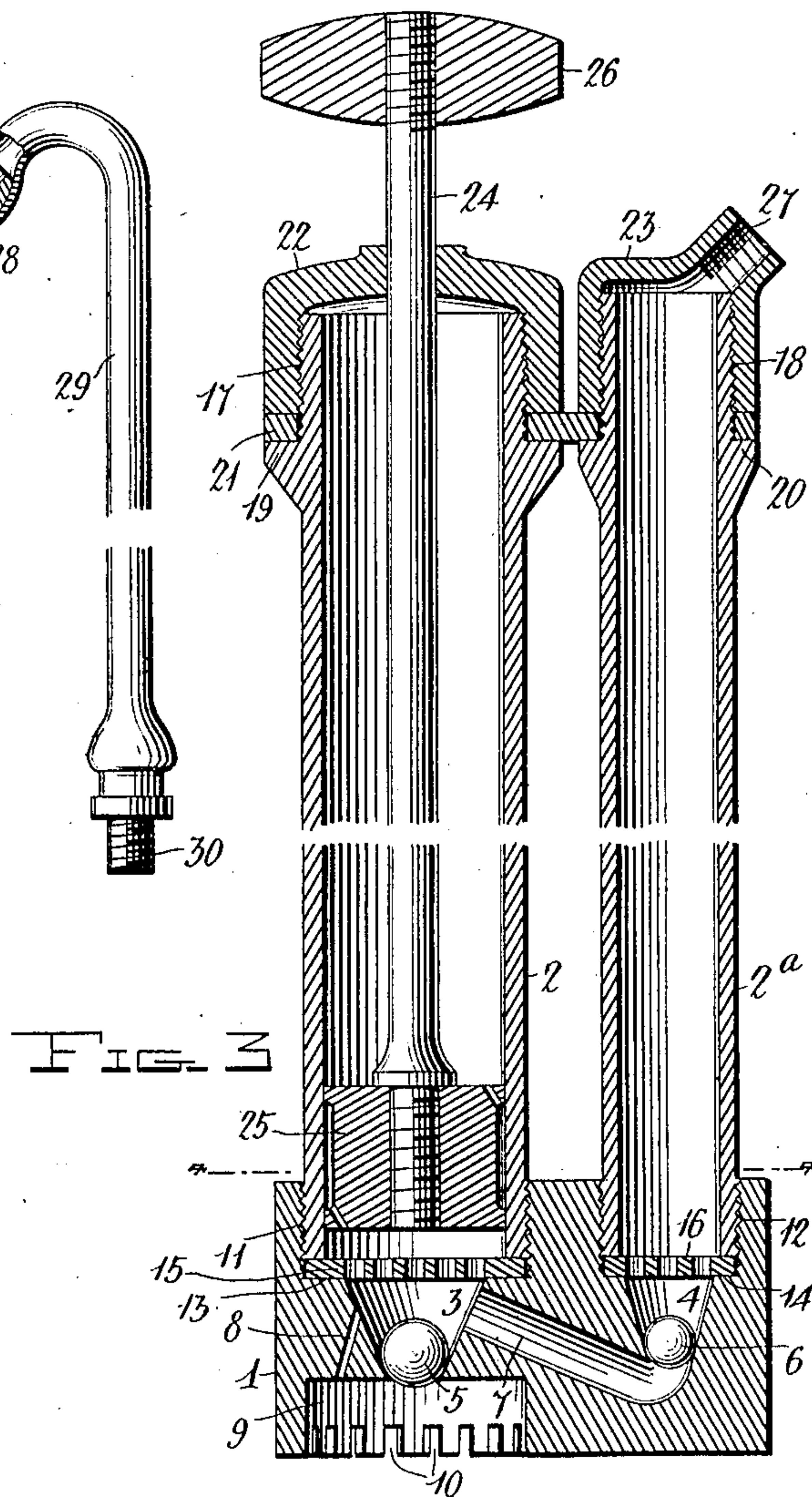
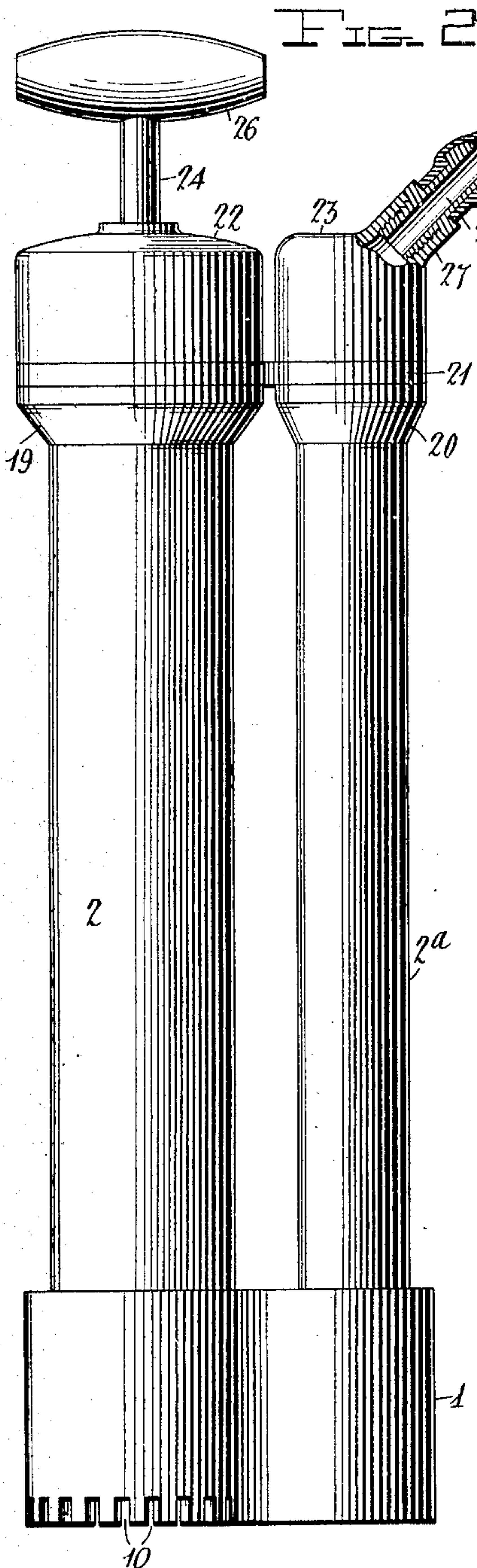
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Witnesses
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UNITED STATES PATENT OFFICE.

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SYRINGE.

No. 916,177.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HOWARD A. MATHER, a citizen of the United States, residing at Pocatello, in the county of Bannock and State of Idaho, have invented new and useful Improvements in Syringes, of which the following is a specification.

This invention relates to syringes, and is designed for all or any of the uses for which the ordinary medicinal syringe is employed.

The object of the invention is to provide a syringe for medical use of novel construction, wherein the parts are readily removable and interchangeable, one in which fluid is drawn into a chamber and ejected through a nozzle at a constant and steady flow, and which is provided with a small passage whereby a portion of the liquid drawn in by one stroke of a piston is forced back into the source of supply by the opposite stroke of the piston, thus agitating and mixing the liquid contained in the source of supply.

To these and other ends this invention resides in the novel construction of parts and their assemblage in operative combination as will hereinafter be more fully described and claimed.

The preferred embodiment of my invention is illustrated in the annexed drawings, in which:—

Figure 1 is a side elevation showing my device provided with a plurality of discharge cylinders and showing the syringe attached to a fluid containing receptacle, Fig. 2 is a side elevation of my improved syringe in which a single discharge cylinder is employed, Fig. 3 is a central vertical section of Fig. 2, and Fig. 4 is a section taken on the line 4—4 of Fig. 3.

In the drawings 1 designates the base of my improved syringe into which is threaded the pump cylinder 2 and the discharge cylinder 2^a.

As shown in the vertical section, Fig. 2 of the drawings, the base 1 is provided with suitable valve chambers 3 and 4, which are adapted for the reception of the ball valves 5 and 6. The valve chambers 3 and 4 are connected with each other by a channel 7. The valve chamber 3 is provided with a small channel or passage 8, which communicates with the enlarged recess 9 provided in the base 1 directly below the valve chamber 3. This recess 9 is provided with cut-away portions 10, whereby the liquid may have free passage into the recess 9 of the base 1.

The threaded recesses 11 and 12, provided by the base 1 for the reception of the pump cylinder 2 and the discharge cylinders 2^a, are of larger circumference than the valve chambers 3 and 4, thus providing annular horizontal surfaces 13—14, which are adapted to receive the valve retaining screens 15 and 16. The screens 15 and 16 are held firmly in position against the surfaces 13 and 14 of the base 1 by the screw threaded pump cylinder 2 and the discharge cylinders 2^a bearing against them.

At their upper extremities the pump 2 and the discharge cylinders 2^a are screw threaded for a suitable distance, as at 17 and 18, and are enlarged just below the terminals of the screw threads to form the annular shoulders 19 and 20, the object of the shoulders 19 and 20 being to present a bearing surface for a connecting ring 21, through the medium of which the pump and discharge cylinders are held in rigid connection with each other. Suitable screw caps 22 and 23 are provided for the pump and discharge cylinders and are adapted to be screwed tightly against the connecting ring 21, thus forcing the same against the annular shoulders 19 and 20 and securing a rigid connection between the members.

The screw cap 22 of the pump chamber 2 is provided with a central annular opening through which works a piston rod 24 connected to a piston head 25 within the chamber 2, the piston rod 24 being provided with a suitable handle 26 by which the piston is operated.

The screw cap 23 of the discharge cylinders 21 is provided with a discharge offset 27, interiorly threaded for the reception of the connection 28 to which the rubber tubing 29 is attached. This tubing 29 has inserted into its free end a connection similar to the connection 28 and provided with the threaded extension 30 to which any desired nozzle may be attached. The base 1 of the syringe is adapted to be inserted within a vessel or basin 35, containing a quantity of the medicated fluid to be injected, and the syringe is held in a rigid position within the vessel, by clamping members 36. The clamping members 36 each comprise an arm 37 provided upon its outer end with a pair of fingers 38 adapted to engage between the upper edges of the vessel 35 and to be secured thereto by a thumb screw 40. The opposite end of each clamping member is provided with a split

collar 37 having perforated ears 38'. The collar 37' is adapted to be engaged upon the discharge cylinders 2^a, and to be locked securely thereon by retaining elements 39 engaging the perforations provided by the ears 30.

The operation is as follows: The base 1 of the syringe being positioned within the vessel containing suitable liquid for injection and the piston being drawn upward opens the valve 5 and sucks a quantity of liquid into the pump cylinder 2. The downward movement of the piston closes the valve 5 and forces the liquid through the channel 7, which raises the valve 6 and allows the liquid to enter the discharge cylinder 2^a. The discharge cylinder 2^a is smaller than the pump cylinder 2, and the outlet through the discharge connection 28 is smaller than the inlet at the seat of the valve 6, thus offering a partial resistance at the point of discharge and the liquid being subjected to pressure by the reciprocation of the piston is caused to flow steadily and continuously. The liquid in the vessel receives a thorough agitation and mixing by a portion of the fluid sucked in by the upward movement of the piston, being forced out through the channel 8 into the liquid contained in the receptacle upon the downward movement of the piston.

From the foregoing description it will be seen that I have produced a syringe that is comparatively inexpensive, which is sure in action and one in which all the parts are readily accessible and removable.

Having thus described the invention what is claimed as new, is:—

1. A syringe for medicinal purposes having a base adapted for partial submersion in a vessel containing an injection fluid, the

base having communicating valve chambers and valves therefor, a pump cylinder having a piston connected to one of the valve chambers, a discharge cylinder connected to the other valve chamber, the base being provided with a fluid inlet opening communicating with the valve chamber of the pump and having a passage between the valve chamber and the inlet opening whereby a portion of the fluid sucked in by the upward stroke of the piston is forced out of the chamber back into the vessel, thereby agitating and mixing the fluid contained in the vessel.

2. The combination with a syringe of the character described, of a vessel and means for connecting the syringe to the vessel, said means comprising members clamped upon the outlet chamber of the syringe and having arms provided with fingers adapted to engage the lip of the vessel and securing devices for retaining the fingers upon the lip of the vessel.

3. In a syringe of the character described comprising a base having inlet passages and valve chambers containing valves and having a passage between the inlet and one of the valve chambers, a pump above this chamber and an outlet cylinder connected to the other chamber, of a collar connecting the pump and outlet cylinders near their upper ends, said collar being adapted to retain the cylinders in position in relation to each other.

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

HOWARD A. MATHER.

Witnesses:

ED. F. FERNIS,
CHASE A. CLARK.