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PATENTED MAR. 17, 1903.

S. SCHWERIN.

VALVE FOR SYRINGES, ATOMIZERS, &c.

APPLICATION FILED MAR. 19, 1901.

NO MODEL.

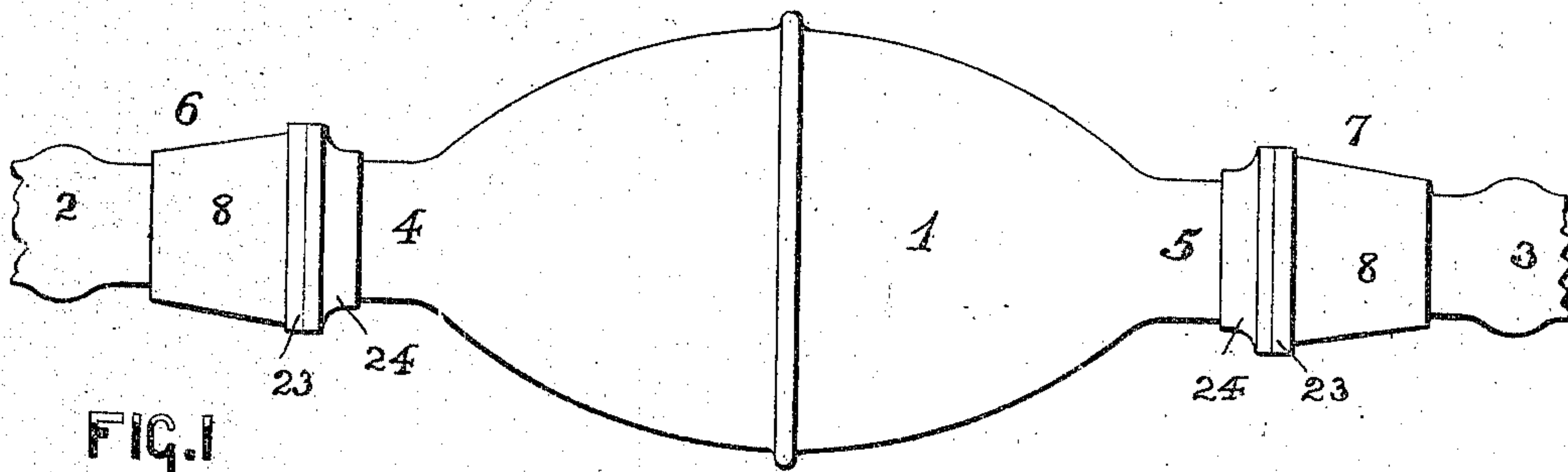


FIG. 1

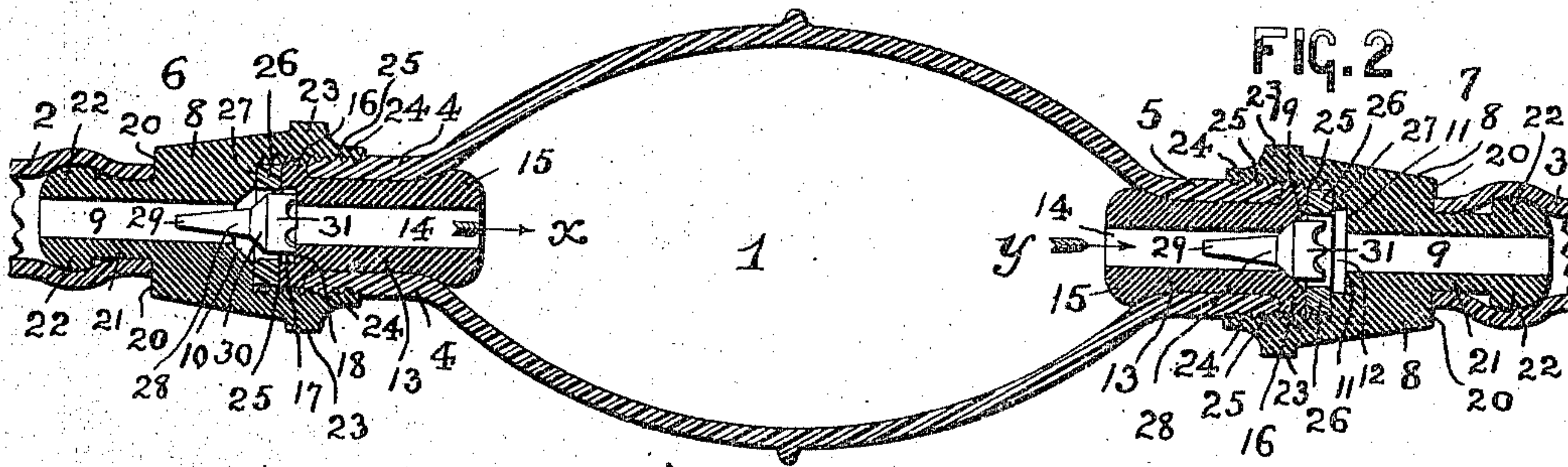


FIG. 2

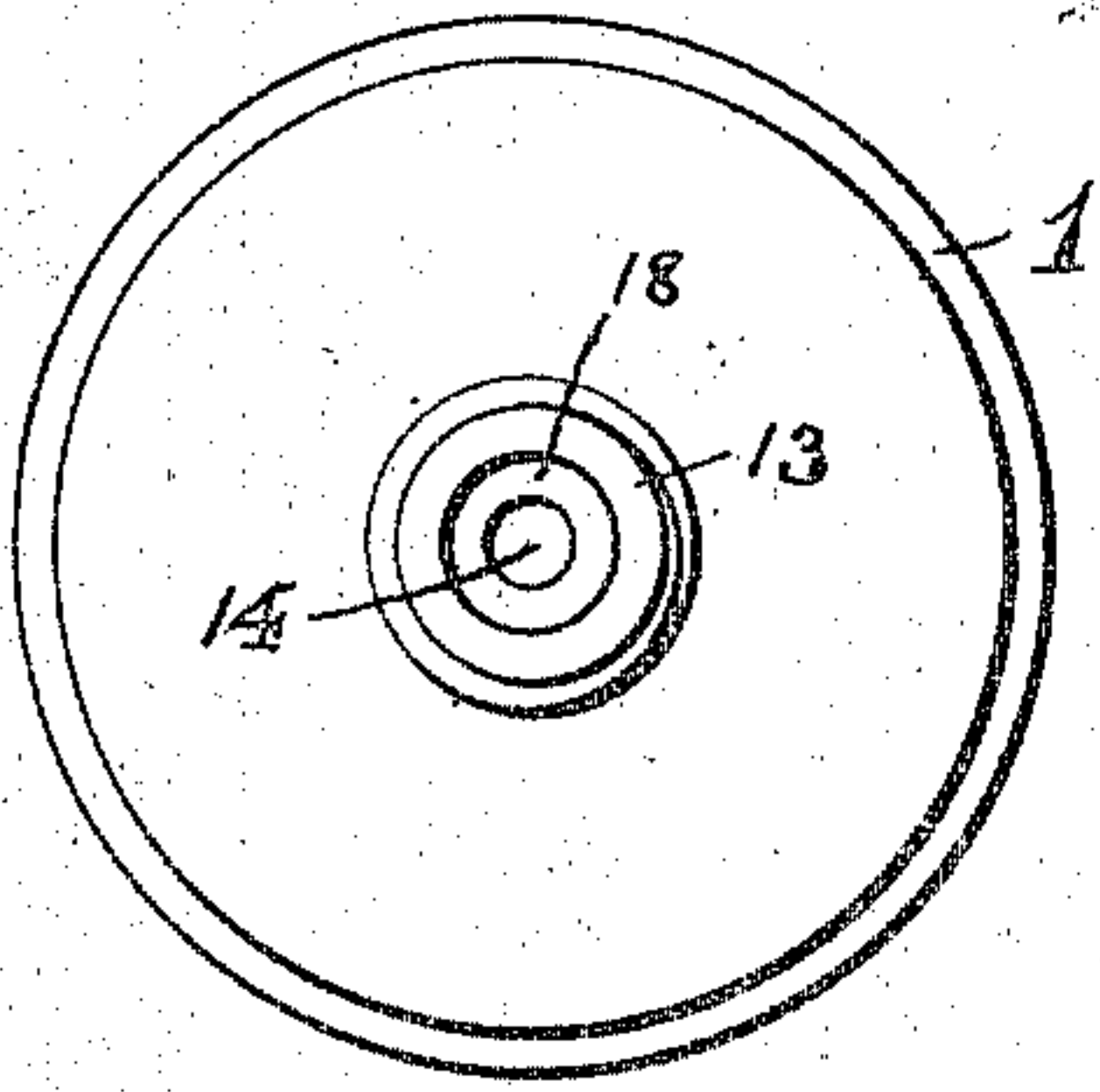
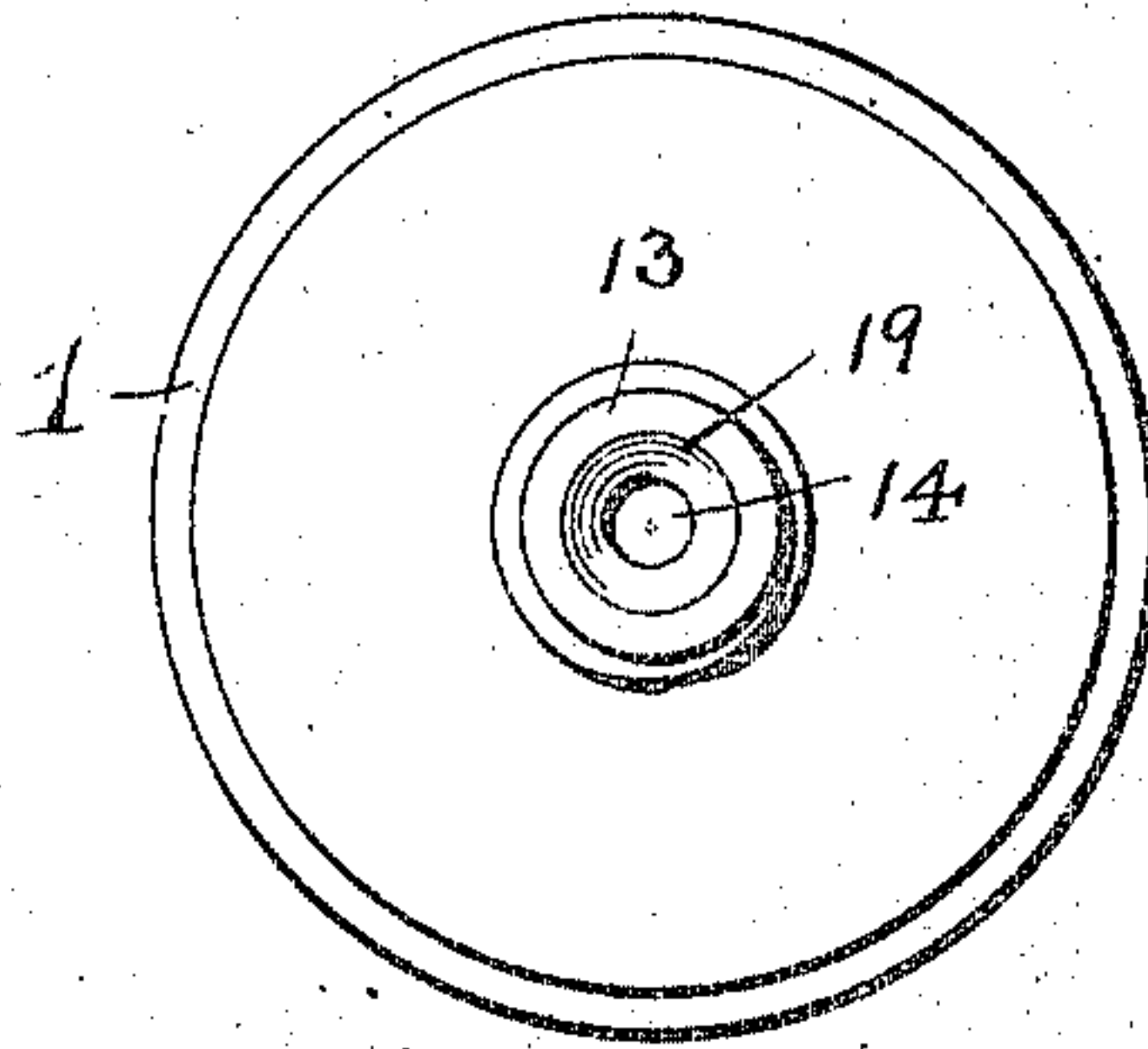


FIG. 3



FILE 4

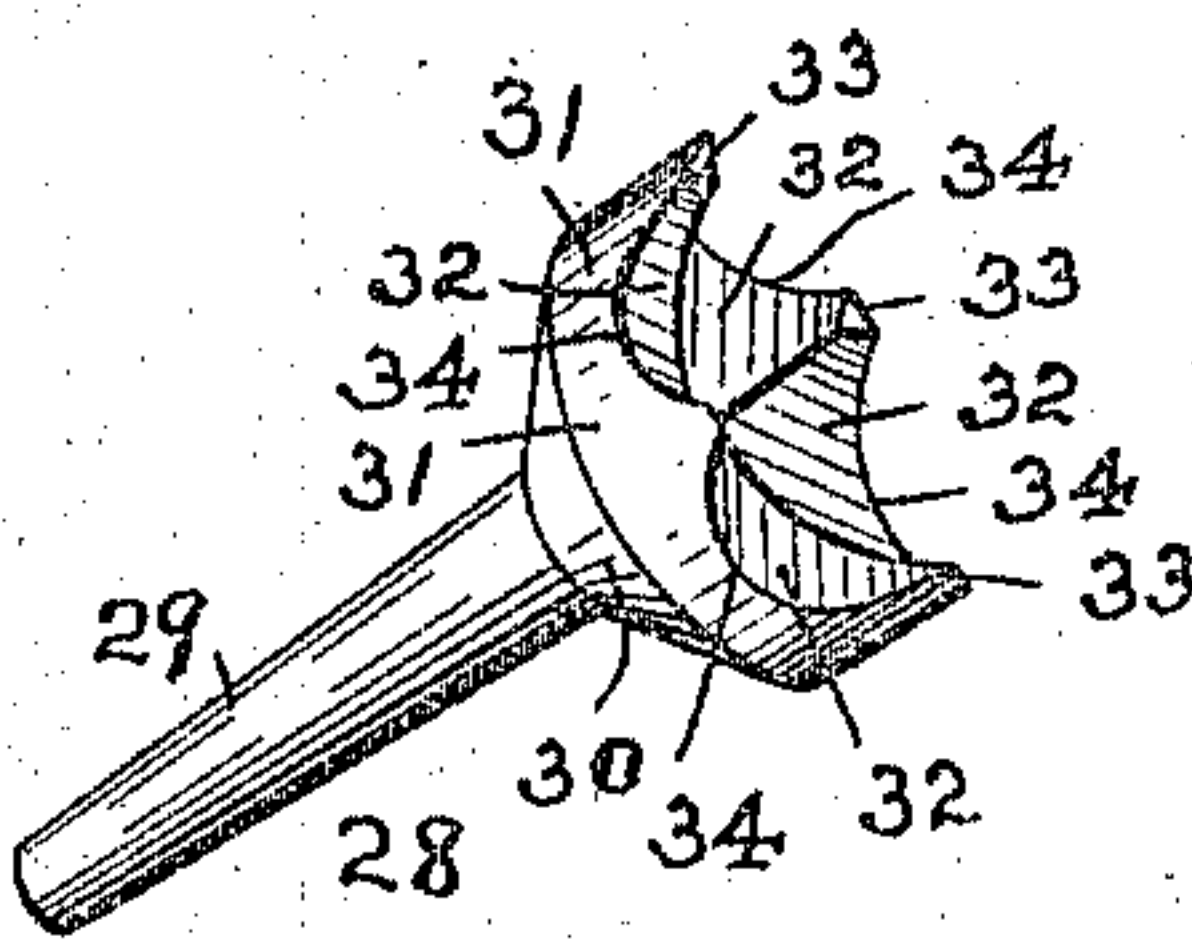


Fig. 5

WITNESSES:

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UNITED STATES PATENT OFFICE.

SILAS SCHWERIN, OF BELLEVILLE, NEW JERSEY, ASSIGNOR TO HARDMAN RUBBER COMPANY, A CORPORATION OF NEW JERSEY.

VALVE FOR SYRINGES, ATOMIZERS, &c.

SPECIFICATION forming part of Letters Patent No. 723,042, dated March 17, 1903.

Application filed March 19, 1901. Serial No. 51,837. (No model.)

To all whom it may concern:

Be it known that I, SILAS SCHWERIN, a citizen of the United States, residing at Belleville, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Valves for Syringes, Atomizers, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention has reference to improvements in valve connections for syringes, atomizers, and the like; and the invention has for its primary object to provide a novel fitting for syringes and atomizers constructed for connecting the end of a flexible piece of tubing with the neck of a syringe or atomizer bulb, the said fitting being of such construction that when it is secured in position and connected with the member of the valve-fitting over which the said flexible neck of the bulb is placed the said first-mentioned valve-fitting will encompass the outer cylindrical surface of the said neck of the bulb. By this means the flexible neck of the bulb is prevented from being distorted and forced out of shape by the manipulations of the bulbs of the syringes or atomizers, and a complete and perfect inclosure is provided at the connection of the bulb and the flexible inlet or induction and outlet or eduction pipes to prevent leakage, as heretofore, which is due to the loss of the life of the rubber neck when not inclosed or when but partially inclosed by means of the metallic fittings as heretofore made can be forced from its position by the distortions of the bulb when squeezed, and the fitting is soon rendered useless in that it does not prevent leakage at the joint.

The primary object of this invention, therefore, is to fully overcome this objection, and, further, to provide a novel construction of valve-fitting and novel valve therein which can be cheaply made, the parts being capable of quick assemblage, and the same construction of valve, usually termed the "tack," be-

ing capable of use in either fitting at either end or neck of the flexible bulb of a syringe.

The present invention, therefore, consists in the novel construction of valve-fitting and valve, as well as in the novel arrangements and combinations of the parts thereof with the flexible neck or necks of a syringe or atomizer bulb, all of which will be fully described in the accompanying specification and then finally embodied in the clauses of the claim, which are appended to this specification.

The invention is clearly illustrated in the accompanying sheet of drawings, in which—

Figure 1 is a view of an air reservoir or bulb usually employed in the ordinary form of syringe, the same being shown provided with an inlet and outlet valve of my novel form and construction; and Fig. 2 is a longitudinal vertical section of the several parts represented in said Fig. 1 to more clearly illustrate the general arrangement and construction of the various parts of the valve-fittings. Figs. 3 and 4 are the two end views of a syringe-bulb, illustrating in position the respective necks of the same the valve members, which are secured directly within the tubular portions of the said necks; and Fig. 5 is a perspective view of the valve or tack which is to be used with either fitting represented in said Figs. 1 and 2.

Similar numerals of reference are employed in all of the said above-described views to indicate corresponding parts.

In the said drawings, 1 indicates the air reservoir or bulb of a syringe, the same being made from flexible material, such as rubber, and 2 and 3 are the usual inlet and outlet tubes, respectively connected with the necks 4 and 5 of the said bulb by means of the valve-fittings 6 and 7, embodying the principles of this invention. The construction and arrangement of the said valve-fittings 6 and 7 are as follows: Each fitting consists, essentially, of a primary member 8, which has a centrally-arranged duct 9, substantially as shown in said Fig. 2 of the drawings, the member 8 of the fitting 6, however, being provided with a cone-shaped valve-seat 10, which is dispensed with in the member 8 of the valve-fitting 7,

said member in this instance being provided with an annular inner shoulder 11, formed by the suitably-enlarged recessed portion 12 in said member. Within each of said necks 4 and 5 of the bulb 1 is arranged a secondary member 13, each member being provided with a centrally-arranged duct 14, an enlargement 15 at the one end and an annular screw-threaded shoulder 16 upon the other end of the member, as shown. The secondary member 13, arranged within the neck 4 of the bulb 1, is provided with a recessed portion 17, formed by the flat annular shoulder 18, as shown, said recessed or chambered portion 17 being of greater cross-area than the cross-area of the duct 14 in said member. The secondary member 13, which is arranged within the neck 5 of the bulb 1, is provided with a cone-shaped valve-seat 19 in place of the said recessed or chambered portion 17, as will be clearly seen from an inspection of said Fig. 2.

Each primary fitting 8 is provided with an annular outer shoulder 20 and an extension 21, which is provided with an enlarged end 22, over which the ends of the respective pieces of tubing 2 and 3 are fitted and secured in position. The main body portion of each fitting or member 6 is preferably made tapering, as shown, being provided with an annular projection 23, which forms a rib or projection and has the annular extension 24 extending therefrom, as shown. Within each extension 24 and extending for some distance into the main body of the member 8 is a chamber which is provided with an internal screw-thread 25. The chamber in each member 8 terminates in a flat shoulder 27, directly in front of the valve-seat 10 in the valve-fitting 6 and directly in front of the enlarged depression 11 in the valve-fitting 7, a suitable soft-rubber washer or other gasket 26 being arranged between the said shoulders 27 of the members 8 and the outer end portions of the said tubular members 13.

Within each fitting 6 and 7 is a valve or tack 28, the same being provided with a stem 29 and an inclined or cone-shaped portion 30 for seating the valve upon the respective valve-seats 10 and 19 for the usual purposes of closing the ducts through the valve-fittings. The head 31 of each valve 28 is made with the curved or concave surfaces 32 and the projections 33, providing the concave openings 34, which are preferably of a semicircular configuration, as clearly illustrated in said Figs. 2 and 5.

The operations of the two valves will be fully understood from an inspection of Fig. 2, the bulb 1 when expanding after having been compressed causing the valve 28 within the fitting 6 to assume the position shown, with the projections 33 forced directly against the shoulder 18 within the member 13 in the neck of the bulb and the valve 28 within the fitting 7 being forced against the valve-seat 19, as shown, whereby the liquid will pass

from the tube 2 through the member 6 and the semicircular openings and depressions 32 in the valve-head in the direction of the arrow x into the interior of the bulb. The bulb 1 thereupon being again compressed in the usual manner, the back pressure from the liquid within the bulb will cause the valve within the fitting 6 to be closed down upon the valve-seat 10 within the member 8, and the valve in the fitting 7 will be forced from its valve-seat 19, with the projections 33 on the valve-head in contact with the annular shoulder 11 of the enlarged depression or chamber 12 in the member 8 of said fitting 7. The liquid will thereupon pass from the bulb 1 in the direction of arrow y through the open valve and the semicircular openings 34 into the outlet or eduction pipe 3, as will be clearly evident.

From the above description it will be clearly evident that I have provided a novel construction of induction and eduction valve for syringes, atomizers, or for other purposes the several parts of which are quickly assembled and the same valve or tack being capable of use in either valve-fitting, whereby in cleaning the valve-fittings no great care is necessary in replacing the valve in either of the valve-fittings, since the valves are interchangeable and either valve can be operatively arranged in either fitting. A further advantage is that the member 8 of each fitting being provided with the chambered portion 24 when screwed upon the screw-threaded shoulder 16 of the member 13 will screw itself upon the outer cylindrical surface of the soft-rubber neck at the ends of the bulb, and thereby provide a perfect and tight joint, free from leakage when the bulb is compressed, and the neck with constant use of the bulb will not become distorted and rendered useless, as is generally the case in the constructions of valve-fittings for syringes as now made, and the syringe or atomizer will last much longer.

Having thus described my invention, what I claim is—

1. In a syringe or atomizer, the combination, with a compressible bulb, having a tubular neck, and a piece of flexible tubing, of a valve-fitting, comprising two separate members, one a primary and the other a secondary member, said secondary member being arranged within said tubular neck of the bulb, and the primary member being connected at one end with said tubing, and having an annular flange provided with a chambered portion in which that part of the secondary member which extends from the neck of the bulb is arranged and secured, said annular flange of the primary member encompassing the outer surface of said neck of the bulb and compressing the same in said chambered portion, substantially as and for the purposes set forth.

2. In a syringe or atomizer, the combination, with a compressible bulb, having a tu-

bulbar neck, and a piece of flexible tubing, of
a valve-fitting, comprising, two separate mem-
bers, one a primary and the other a secondary
member, said secondary member being ar-
5 ranged within said tubular neck of the bulb,
and having a screw-threaded flange extending
from said neck, and the primary member being
connected at the one end with said piece of
flexible tubing, and having an annular flange
10 providing a chambered portion, said portion
having an internal screw-thread for securing
said flange upon the screw-threaded flange of
said secondary member, and said annular
flange of the primary member encompassing
15 the outer surface of said neck of the bulb and
compressing the same in said chambered por-
tion, substantially as and for the purposes set
forth.

3. In a syringe or atomizer, the combina-
20 tion, with a compressible bulb, having a tu-
bular neck, and a piece of flexible tubing, of
a valve-fitting, comprising, two separate mem-
bers, one a primary and the other a secondary
member, said secondary member being ar-

ranged within said tubular neck of the bulb, 25
and the primary member being connected at
one end with said tubing, and having an an-
nular flange provided with a chambered por-
tion in which that part of the secondary mem-
ber which extends from the neck of the bulb 30
is arranged and secured, said annular flange
of the primary member encompassing the
outer surface of said neck of the bulb and
compressing the same in said chambered por-
tion, and a "tack-valve" in said chambered 35
portion, consisting, of a head having a cone-
shaped surface, projections 33 and concave
depressions 32 formed with semicircular open-
ings, and a stem extending from said cone-
shaped surface, substantially as and for the 40
purposes set forth.

In testimony that I claim the invention set
forth above I have hereunto set my hand this
18th day of March, 1901.

SILAS SCHWERIN.

Witnesses:

FREDK. C. FRAENTZEL,
GEO. D. RICHARDS.