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 WATER BAG SYRINGE.  
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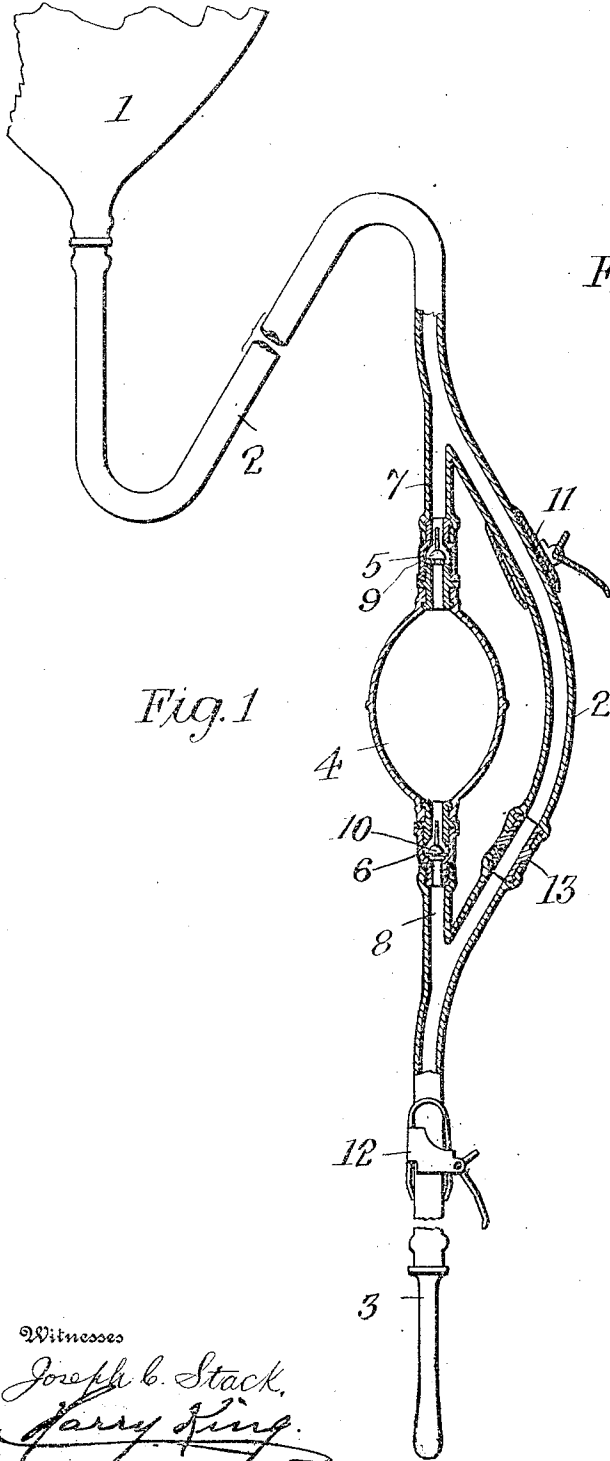


Fig. 1

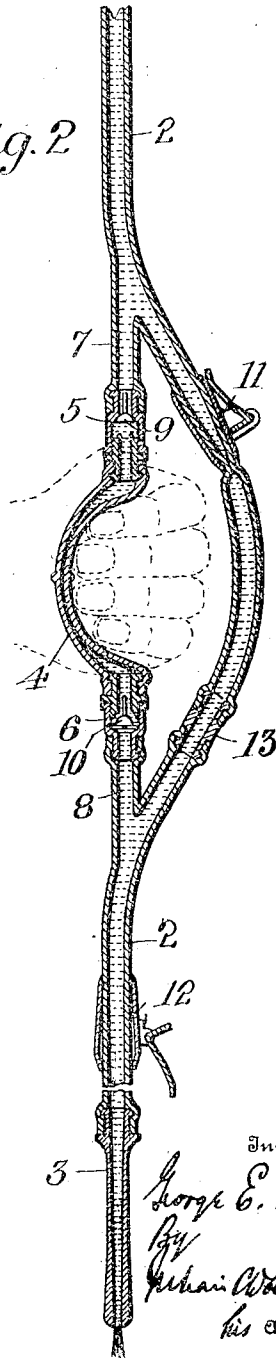


Fig. 2

Witnesses  
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# UNITED STATES PATENT OFFICE.

GEORGE E. KIM, OF PITTSBURG, PENNSYLVANIA.

## WATER-BAG SYRINGE.

No. 926,197.

Specification of Letters Patent.

Patented June 29, 1909.

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*To all whom it may concern:*

Be it known that I, GEORGE E. KIM, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Water-Bag Syringes; 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.

My invention relates to syringes, and its principal object is to provide a fountain syringe that can be used to give a continuous gravity flow; or, cutting off such gravity flow, the syringe can be used to give a strong pressure-actuated or force flow.

The invention embodies a suitable reservoir, in practice a suspensible rubber bag, having connected thereto a discharge tube unobstructed throughout its bore by valves or other obstructions, and provided at its lower end with a discharge nozzle. Connected into the discharge tube intermediate its ends is a by-pass provided between such points of connection with an elastic pressure-bulb the inlet and outlet of which are controlled by valves removable with the bulb. Intermediate its opposite points of connection to the pressure by-pass, the discharge tube is provided with a tube-compressing clamp. With this construction, a copious gravity flow is obtained, owing to the absence of obstructions throughout the bore of the discharge tube. At times, however, an abundant flow under pressure is desirable. To obtain this, the tube-compressing clamp on the discharge-tube opposite the by-pass is closed, thus cutting off completely all discharge from the water-bag except that which passes through the pressure bulb and is subjected to pressure therein.

Another object of my invention is to arrange the interior valves of the by-pass so that they are removable, if desired, with the pressure-bulb.

Referring to the accompanying drawing, which forms a part of this specification, Figure 1 is an elevation of a fountain syringe embodying this invention, showing the by-pass, its pressure-bulb and the adjacent portion of the discharge-tube in section. Fig. 2 is a longitudinal section showing the syringe as when used to give a pressure-actuated discharge, the gravity discharge having been cut off.

1 denotes a reservoir, preferably a rubber water-bag adapted to be suspended from a suitable support, and to the reservoir is suitably connected a compressible discharge-tube 2, of rubber or other suitable material, which terminates in a discharge nozzle 3.

The pressure-means, connected into the discharge-tube intermediate its ends, comprises an elastic pressure-bulb 4, having end-connections 5 and 6 by means of which the bulb is connected to an inlet tube 7 and an outlet tube 8, these tubes communicating with the discharge-tube 2 to form a by-pass therefor through the pressure bulb. The end connections 5 and 6 are each preferably composed of separable sections, one of which is detachably engaged by an end of the bulb and the other is likewise engaged by a tube of the by-pass; and each end-connection houses a valve 9 or 10 and provides a seat therefor, the valve 9 being the inlet valve and the valve 10 the outlet valve.

A tube-compressing clamp 11 is applied to the discharge tube 2, intermediate its points of communication with the by-pass; and a similar clamp 12 is preferably applied to the discharge tube below its junction with the outlet tube 8. The clamps 11 and 12 may be of the type shown, wherein oppositely disposed resilient jaws straddle a portion of the tube and are adapted to compress the tube by being forced together by a cam-lever carried by one of the jaws; or they may be of other suitable type.

The discharge tube 2, intermediate its connections with the pressure by-pass, is preferably separable, being united by a suitable union or coupling 13, one advantage of which is that it provides for the easy disposition of the clamp 11 upon the discharge tube.

The operation of the syringe, stated generally, is as follows: If a gravity flow be desired the clamp 11 is left open, the discharge tube thus forming an unobstructed channel through which the liquid in the water-bag 1 discharges. If a pressure discharge or force-flow be desired, the clamp 11 is closed, cutting off all discharge from the reservoir except through the pressure bulb 4, and it will be seen that all liquid passing from the reservoir is now subjected to the pressure of the bulb, giving an abundant discharge under pressure, as represented in Fig. 2. The inlet valve 9 permits the flow of water from the tube 7 into the pressure bulb, but prevents a reverse flow; likewise the outlet valve 10

permits an outflow from the pressure bulb into the tube 8, but prevents a reversal of such flow. The closing of the discharge-tube by the clamp 11 prevents the pressure discharge of the bulb from forcing a column of water back up the discharge tube 2, which would minimize the pressure of the discharge as an outlet other than through the discharge nozzle would be thus formed, and such upwardly forced column of water would interfere with a proper feeding of the pressure-bulb. The bottom clamp 12 may be used to compress the discharge tube and prevent the outflow of water when the syringe is not in use.

Having thus described my invention, what I claim is:--

1. In a syringe, the combination with a reservoir, of a discharge-tube connected thereto, a by-pass communicating at its opposite ends with the discharge-tube intermediate its ends, a pressure-bulb connected in

the by-pass, and means operable to close the discharge-tube intermediate its points of communication with the by-pass when using the syringe to obtain a pressure discharge.

2. In a syringe, the combination with a reservoir, of an unobstructed discharge-tube connected thereto, said discharge tube having a by-pass, a portion of the by-pass being removable and containing a pressure-bulb and an inlet valve and an outlet valve for the pressure bulb, both valves closing under pressure in the direction of the reservoir, and clamp-means operable to compress the discharge-tube to close it opposite the by-pass when using the syringe to obtain a pressure discharge.

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

GEORGE E. KIM.

Witnesses:

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