

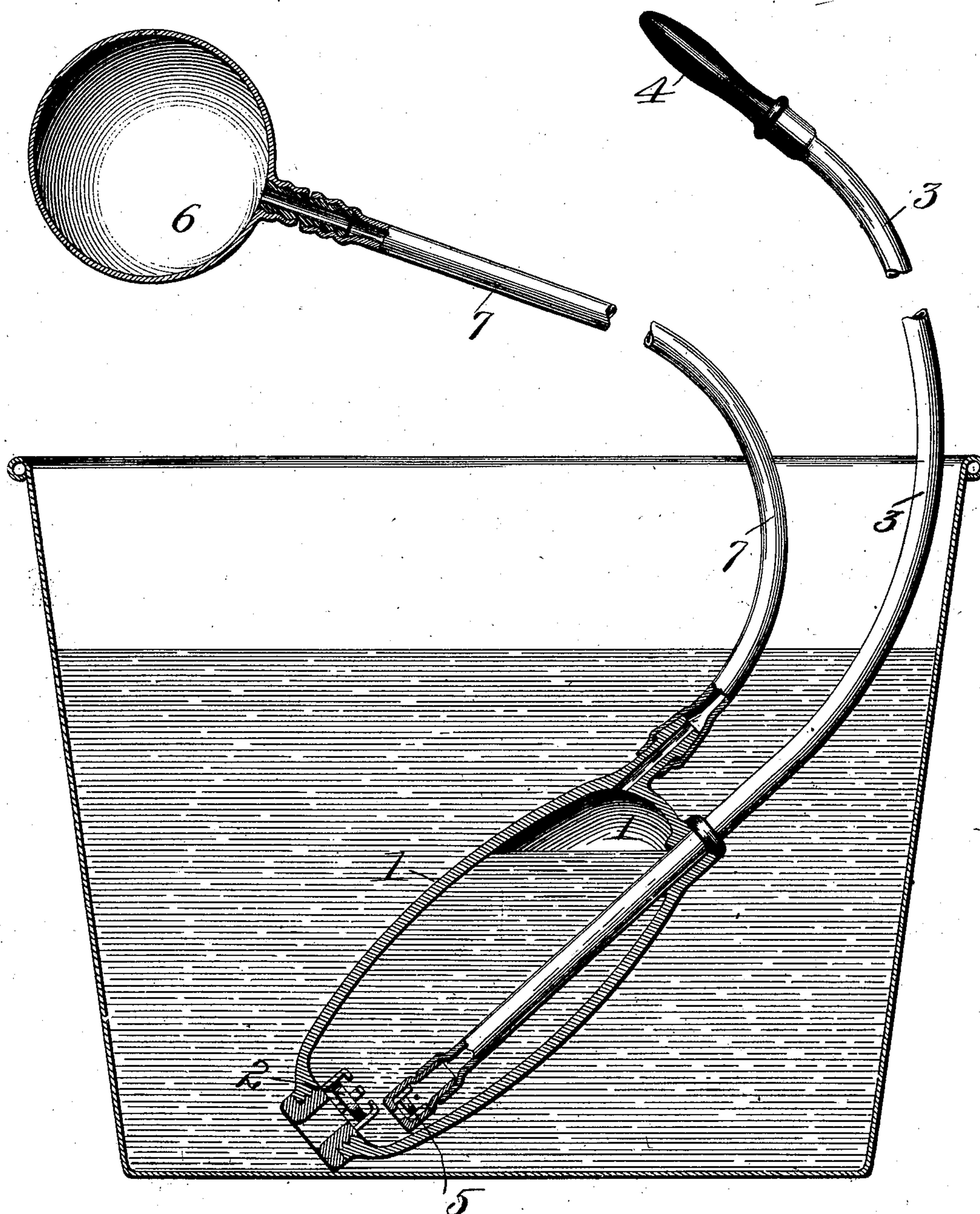
No. 720,648.

PATENTED FEB. 17, 1903.

E. B. WILDER.  
SYRINGE.

APPLICATION FILED JAN. 6, 1902.

NO MODEL.



Witnesses:

Wm. A. Scott.  
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*Inventor:*

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by

Can't Care

Atty's.



# UNITED STATES PATENT OFFICE.

EDWARD B. WILDER, OF ST. LOUIS, MISSOURI.

## SYRINGE.

SPECIFICATION forming part of Letters Patent No. 720,648, dated February 17, 1903.

Application filed January 6, 1902. Serial No. 88,596. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD B. WILDER, a citizen of the United States, and a resident of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Syringes, of which the following is a specification.

My invention relates to syringes, and has for its principal objects to make the syringe self-charging, to secure a rapid action, and to utilize the pressure of the liquid for expanding the bulb.

It consists in the parts and in the arrangement and combination of parts hereinafter described and claimed.

The accompanying drawing, which forms part of this specification, is a vertical sectional view of the device.

My device comprises a receptacle 1, of hard rubber or other suitable material, and is preferably rigid. This receptacle has an opening, preferably in its lower end, which opening is controlled by a valve 2. This valve 2 is of any suitable type adapted to close automatically, so as to be normally seated, but adapted to yield automatically to pressure from outside of the receptacle. The receptacle 1 has an outlet or discharge tube 3, which opens into said receptacle near the lower end thereof. This discharge-tube 3 is provided at its outer end with an ordinary nozzle 4 and is also provided with a normally closed automatic valve 5, adapted to open automatically to pressure from below, so as to permit liquid to pass from the receptacle through said valve. This valve is preferably located at the lower end of the discharge-tube and is arranged to be removed easily therefrom.

The receptacle 1 has a flexible bulb 6 communicating therewith through a tube 7. This bulb is of the ordinary kind adapted to be squeezed or manipulated by hand, and its capacity is less than the capacity of the receptacle above the opening into the discharge-tube.

The operation of the device is as follows: The receptacle 1 is immersed in the liquid to be injected, and the pressure-bulb 6 is squeezed by hand to drive the air therefrom. So long as the pressure-bulb is collapsed the liquid which enters the receptacle from below

can rise only a short distance above the opening into the discharge-tube. The difference between the levels of the liquid inside and outside of the receptacle causes an upward pressure on the air confined in said receptacle. When the hand-pressure on the bulb is released, the difference in the levels of the liquid causes the liquid to rise in said receptacle through the valve 2, which opens automatically, so as to admit liquid into the receptacle. The air inside of the receptacle being compressed by this pressure flows into the bulb and inflates it. The air thus compressed acts as a motive fluid to expand the bulb, and as the air acts independent of the elasticity of the bulb the bulb is much quicker in its action than the bulb in the construction commonly used, where the replenishing of the liquid is effected by the section created by the elasticity of the bulb. It is to be noted that the invention is of the greatest efficiency when the difference between the level of the liquid outside of the receptacle and the level inside thereof is greatest and that the hydrostatic pressure ceases to be effective in charging the receptacle when the liquid in the receptacle rises to the level of the liquid outside thereof. If the level of the liquid outside of the receptacle falls to the level inside, the resiliency of the bulb will cause it to continue to act by suction. The receptacle is thus charged with the liquid automatically, and thereupon the valve 2 therein closes. When the bulb is again squeezed, the liquid is forced through the discharge-tube, the automatic valve therein opening to permit such action, whereupon the valve again closes. The pressure on the bulb is again released to replenish the receptacle with liquid and the operation above noted repeated. One of the principal advantages of this mode of operation is that the pressure-bulb and discharge-nozzle may be manipulated at a considerable distance from the receptacle.

Obviously the device hereinbefore described admits of considerable modification without departing from my invention, and I do not wish to restrict myself to the specific construction herein described.

What I claim is—

1. A syringe comprising a receptacle adapted to be immersed in the liquid, a pressure-



bulb, and a tube connecting said receptacle and the bulb, all arranged so that when said receptacle is submerged and charged the level of the liquid therein is lower than the level of the main supply, whereby the hydrostatic pressure of such supply is effective in charging said receptacle, substantially as described.

2. A syringe comprising a receptacle adapted to be immersed in the liquid, said receptacle having a valved opening for the admission of liquid and having a pressure-bulb and a discharge-tube, the capacity of said receptacle above the opening of the discharge-tube being greater than the capacity of said bulb, whereby the hydrostatic pressure of the liquid is effective in charging said receptacle, substantially as described.

3. A syringe comprising a receptacle adapted to be immersed in the liquid, said receptacle having a valved opening for the admission of liquid and having a pressure-bulb and a discharge-tube, the capacity of said receptacle above the opening of the discharge-tube being greater than the capacity of said bulb, whereby the hydrostatic pressure of the liquid is effective in charging said receptacle, said discharge-tube having an automatic valve therein, substantially as described.

4. A syringe comprising a receptacle adapted to be immersed in the liquid, said receptacle having a valved opening for the admission of liquid and having a pressure-bulb and a discharge-tube, the capacity of said receptacle above the opening of the discharge-tube being greater than the capacity of said bulb, whereby the hydrostatic pressure of the liquid is effective in charging said receptacle, said discharge-tube having an automatic valve at its lower end, substantially as described.

5. A syringe comprising a receptacle adapted to be immersed in the liquid, said receptacle

having a valved opening at one end adapted to admit liquid, and having a pressure-bulb communicating with its opposite end and said receptacle also having a discharge-tube communicating therewith near said valved opening, all arranged so that when the receptacle is submerged and fully charged, the level of the liquid therein is lower than the level of the main supply, substantially as described.

6. A syringe comprising a receptacle adapted to be immersed in the liquid, said receptacle having a valved opening at one end adapted to admit liquid and having a pressure-bulb communicating with its opposite end and said receptacle also having a discharge-tube communicating therewith near said valved opening, said pressure-bulb being of less capacity than the capacity of said receptacle, whereby the hydrostatic pressure of the liquid is effective in charging said receptacle, substantially as described.

7. A syringe comprising a receptacle adapted to be immersed in the liquid, said receptacle having a valved opening at one end adapted to admit liquid and having a pressure-bulb communicating with its opposite end and said receptacle also having a discharge-tube communicating therewith near said valved opening, said pressure-bulb being of less capacity than the capacity of said receptacle, whereby the hydrostatic pressure of the liquid is effective in charging said receptacle, said discharge-tube having an automatic valve therein, substantially as described.

Signed at St. Louis, Missouri, this 4th day of January, 1902.

EDWARD B. WILDER.

In presence of—

JOHN P. PRIMEAU,  
WM. P. CARR.