

J. H. SHEETS.
 SYRINGE.

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984,037.

Patented Feb. 14, 1911.

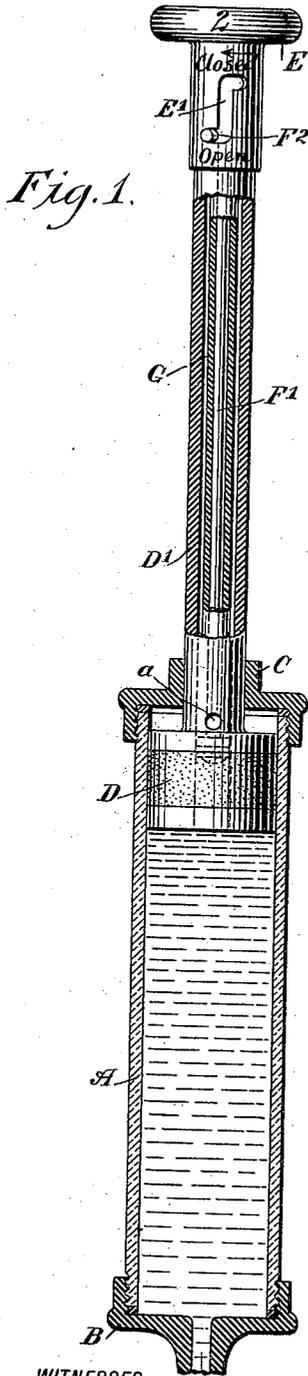


Fig. 1.

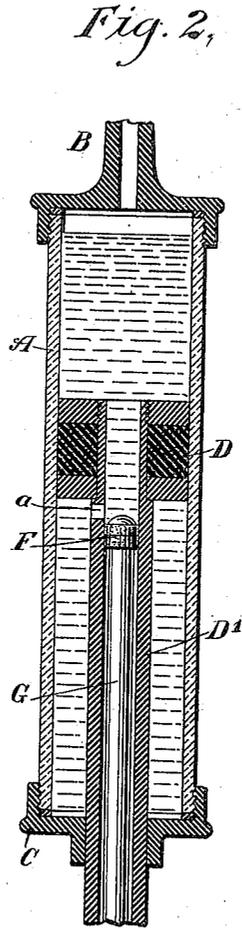


Fig. 2.

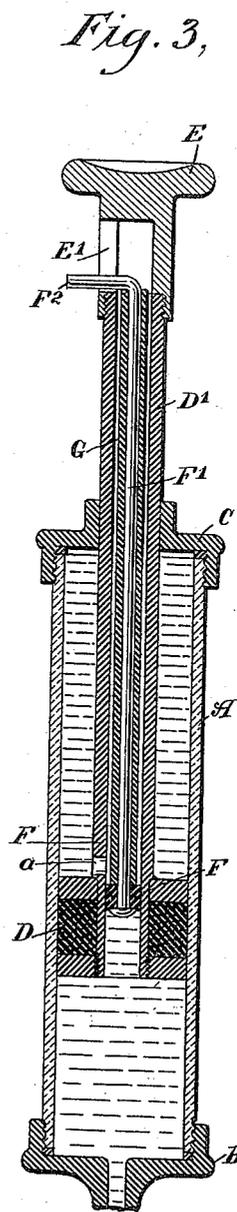


Fig. 3.

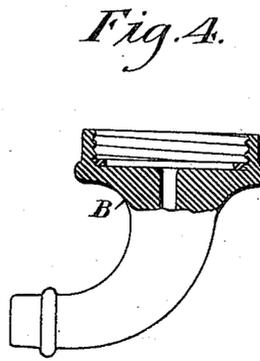


Fig. 4.

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SYRINGE.

984,037.

Specification of Letters Patent. Patented Feb. 14, 1911.

Application filed May 11, 1909. Serial No. 495,250.

To all whom it may concern:

Be it known that I, JOHN H. SHEETS, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Syringe, of which the following is a full, clear, and exact description.

The invention relates to syringes of the barrel and piston type, such, for instance, as shown and described in the Letters Patent of the United States, No. 730,054, granted to me on June 2, 1903.

The object of the present invention is to provide a new and improved syringe, which is simple in construction, composed of comparatively few parts, and arranged to form a container for safely carrying a large quantity of liquid, to be ejected periodically in small doses as required. For the purpose mentioned the hollow piston rod of the piston is provided with a port controlled by a valve, having its stem extending through the hollow piston rod to the outside, to allow the user of the syringe to shift the valve relative to the port, so that the liquid can be readily drawn into the barrel to fill the same. The liquid can be transferred in the barrel from the front or suction end to the rear of the barrel, and a measured portion of the liquid can be transferred from the rear of the barrel to the front thereof, to be forcibly ejected through the nozzle.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is an enlarged sectional side elevation of the improvement, showing the parts in position when filling the barrel with a liquid; Fig. 2 is a transverse section of the same, on the line 2—2 in Fig. 1 showing the parts in position for transferring a portion of the liquid from the rear of the barrel to the front end thereof; Fig. 3 is a similar view of the same, showing the parts in position for ejecting the dose through the nozzle to the afflicted part; and Fig. 4 is a side elevation, partly in section, of one of the interchangeable nozzles to be used on the barrel.

The barrel A, of glass or other suitable material, is preferably screw-threaded at both ends, and on the forward end screws

an interchangeable nozzle B, of any approved construction, and the rear end of the barrel A is closed by a head C. In the barrel A is mounted to reciprocate a piston D, provided with a hollow piston rod D', extending through the head C and terminating at its outer end in a handle E, adapted to be taken hold of by the user of the syringe, for moving the piston D forward or backward in the barrel A.

The hollow piston rod D' is provided, adjacent to the rear face of the piston D, with a port *a*, leading to the bore of the hollow piston rod D' and opening into the rear end of the barrel A, so as to establish communication between the front and rear ends of the barrel, and also to connect the rear end of the barrel A with the atmosphere for vent purposes, as hereinafter more fully explained. The port *a* is controlled by a valve F, preferably in the form of a disk mounted to slide in the bore of the hollow piston rod D', and the stem F' of the valve F extends rearwardly through the hollow piston rod D' and terminates at its rear end in an angular handle F², passing through a bayonet slot E' formed in the shank of the piston rod handle E. The valve stem F', between the valve F and the handle F², is preferably covered by a tubular lining G, of rubber or other suitable material, the stem F' being preferably of metal and the valve F being preferably of leather, rubber or other suitable material. When the handle F² of the valve F is in the outer end of the slot E', then the valve F uncovers the port *a*, as shown in Fig. 2, to establish communication between the front and rear ends of the barrel A by way of the front end of the bore of the piston rod D' and the port *a*. When the handle F² is moved to the inner end of the slot E', then the valve F is in front of the port *a* (see Figs. 1 and 3), so that communication is established between the rear end of the barrel A and the atmosphere, by way of the port *a*, the rear portion of the bore of the piston rod D' and the slot E'. When the handle F² is moved into an intermediate position, approximately midway between the ends of the slot E', then the valve F closes the port *a*, thus disconnecting the front and rear ends of the barrel from each other, and also disconnecting the rear end of the barrel from the atmosphere.

When it is desired to fill the barrel A with the liquid or other fluid, then the op-

erator moves the piston D to the front end of the barrel A, and shifts the valve F forward past the port *a* to the position shown in Figs. 1 and 3. The nozzle B is now immersed in the liquid, and the piston D is drawn rearward, so that the liquid is drawn into the front end of the barrel A, to fill the same, while the air in the rear end of the piston can escape through the port *a* and the bore of the piston rod D' and slot E', as previously explained. After the barrel A is filled, the syringe is turned upside down, as shown in Fig. 2, and then the operator pushes the handle F² to the rear end of the slot E', so that the valve F moves to the rear of the port *a*. The operator now pushes the piston D forward in the barrel A, so that the liquid contained in the front end of the barrel A flows to the rear end thereof by way of the port *a* and the front end of the bore of the piston rod D'. When the liquid has been transferred from the front end of the barrel to the rear end thereof, then the operator moves the handle F² to an intermediate position for the valve F to close the port *a*. The liquid is now entrapped in the rear of the barrel A, and the syringe containing the liquid can be safely carried about in a pocket without danger of the liquid accidentally passing out of the barrel.

When it is desired to eject a measured quantity of the liquid to an afflicted part, the operator moves the handle F² to the rear end of the slot E', so as to uncover the port *a*, the syringe being held in the upside down position, as shown in Fig. 2. Now by drawing the piston D rearward in the barrel A, the portion of the liquid in the rear end of the barrel is transferred to the front end thereof, and when the desired amount of liquid has been transferred the operator moves the handle F² forward to the front end of the slot E', so that the valve F passes beyond the port *a*. Now when the operator pushes the handle E forward, the piston D ejects the measured quantity in the front end of the barrel A through the nozzle B to the afflicted part, and air is free to pass into the rear end of the barrel A by way of the slot E', the bore of the piston rod D' and the port *a*, as will be readily understood by reference to Fig. 3. After the liquid is ejected, the operator returns the handle F² to an intermediate position, so that the valve F closes the port *a*.

From the foregoing it will be seen that by the arrangement described, a desired amount of liquid in the rear end of the bar-

rel can be transferred to the front end of the barrel, to be ejected, and this operation can be repeated as long as the barrel contains the liquid.

The syringe shown and described is very simple in construction, composed of comparatively few parts, not liable easily to get out of order.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A syringe, comprising a barrel, a piston movable therein and having a hollow piston rod provided with a port opening into the barrel at the rear of the piston, and a manually-controlled valve movable in the said piston rod and controlling the said port, the stem of the said valve extending through the said hollow piston rod to the outside thereof for manipulation by the user of the syringe.

2. A syringe, comprising a barrel, a piston movable therein and having a hollow piston rod provided with a port opening into the barrel at the rear of the piston, and a manually-controlled valve movable in the said piston rod and controlling the said port, the said valve having its stem extending through the hollow piston rod, the outer end of the valve stem having a handle.

3. A syringe, comprising a barrel, a piston movable therein and having a hollow piston rod provided with a port opening into the barrel at the rear of the piston, the forward portion of the said hollow piston rod and the port forming a connection for the passage of the liquid from the front end of the barrel to the rear end thereof and vice versa, and the rear portion of the said hollow piston rod forming with the said port a vent for the escape and entrance of the air from and to the rear end of the barrel, and a manually-controlled valve controlling the said port, the said valve having a body and a valve stem within the hollow piston rod, the said body being adapted to move to either side of the said port or to close the same, and the said valve stem having its outer end provided with a handle extending in a bayonet slot formed in the outer end of the piston rod.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN H. SHEETS.

Witnesses:

THEO. G. HOSFER,
JOHN P. DAVIS,