

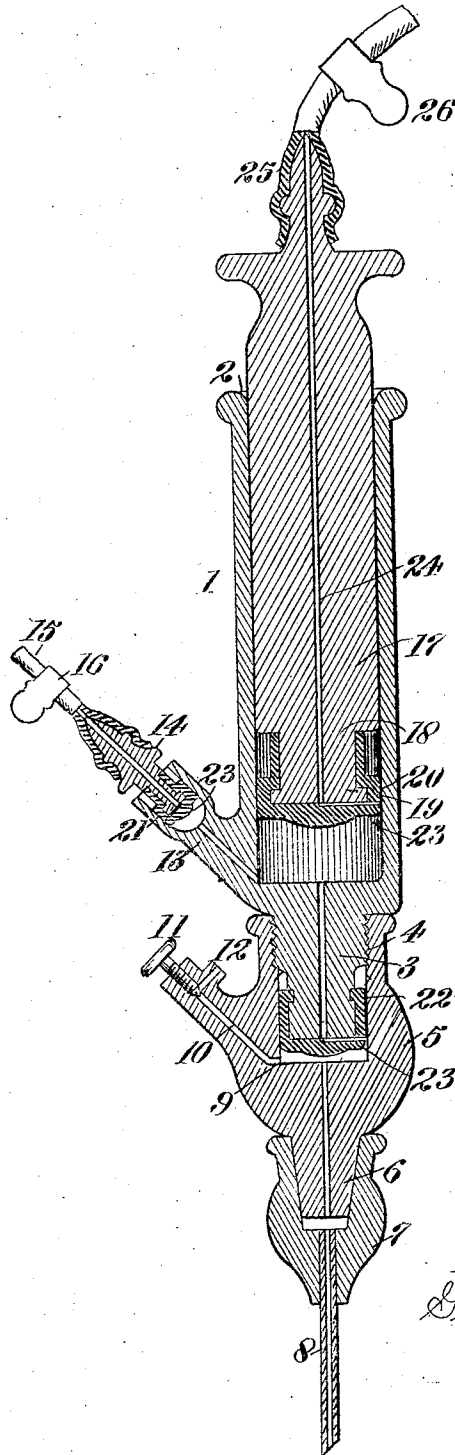
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G. N. HEIN

VALVE PISTON AND BARREL CONSTRUCTION FOR HYPODERMIC SYRINGES

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VALVE PISTON AND BARREL CONSTRUCTION FOR HYPODERMIC SYRINGES.

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To all whom it may concern:

Be it known that I, GEORGE N. HEIN, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Valve Piston and Barrel Construction for Hypodermic Syringes, of which the following is a specification.

The present invention relates to apparatus for hypodermically injecting solutions, serum, toxins and the like, into the human body.

The invention has among its objects to provide a structure by the use of which successive charges of fluid can be injected without removing the needle from the tissues, and by a continuous operation of the piston. Another object is to provide a plurality of fluid admission channels leading into the syringe barrel and controlled by valves through which fluids to intermix within the barrel may be admitted therinto and during the outward movement of the piston and ejected into the tissues by an inward movement of the piston. Among the other objects are to provide a structure wherein there is included a blood letting channel communicating with the atmosphere through a valved opening and connected with the bore of the needle to provide a novel form of piston head and flap valve structure associated with the piston, and to provide a flap valve structure associated with the outlet extension of the syringe barrel.

With the above mentioned and other objects in view, the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawings and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawing disclosing one embodiment of my invention the figure is a view in longitudinal section.

Referring to the drawing, 1 indicates a tubular syringe barrel open at one end as at 2 and provided at its opposite end with a tubular extension 3. To this tubular extension 3 is detachably secured, preferably by threading attachment 4, an adapter 5 which,

in turn, is provided with a tubular extension or nipple 6 to which is secured the base 7 mounting a conventional form of hypodermic needle 8. From the bore 9 of the adapter extends a lateral channel 10 controlled by a valve 11 and opening to the atmosphere, as at 12.

When in use, the operator may by opening the valve 11, after the needle has been inserted in the tissue, readily observe a blood flow through the opening 12, provided the needle is in the proper location; thus the channel 8 and valve 11 are instrumental in enabling the user to ascertain whether the needle is in communication with the proper structure.

Laterally from the barrel 1 there extends a tubular portion 13 in which is received a coupling 14, from which extends a flexible pipe 15, the passage of fluid through which is controlled by a clamp valve 16.

Reciprocally mounted within the barrel 1 is the piston 17, the body of which is of a diameter to snugly fit the inner wall of the barrel, and said piston at its inner end is reduced, as at 18, providing a peripheral end flange 19.

Stretched over the inner end of the piston 17, the inner end of the coupling 14 and the end of the tubular extension 3 are the respective elastic hoods 20, 21 and 22, each of which extends downwardly over the side wall of its respective mounting body, and each is cut inwardly from its outer edge to its approximate center on a line substantially parallel with the end of its mounting body to provide a lip or flap 23. The member 20 associated with the piston 17 overlies the flange 19, and at this point the outer surface of the elastic member yieldably engages the inner wall of the barrel 1 and affords a head or packing for the piston 17.

This construction is also true of the member 21 associated with the coupling 14, the peripheral edge of the member 21 affording a fluid tight connection with the inner wall surface of the member 13.

The piston 17 is provided with a longitudinal bore 24, opening at opposite ends thereof, and with its outer end is connected a flexible tube 25 controlled by a spring clamp 26.

In operation, the device being assembled as in the drawing, the spring clamp 16 may be released, and on each outward movement of the piston 17 fluid will be drawn into the

barrel through this lateral inlet, as flap 23 of member 22 will be closed and the corresponding flap of member 21 will be caused to open during this piston movement. The inward movement of the piston 17 will eject the fluid through the needle 8, as during this operation the flap member 23 will be seated.

It will be understood that if another type of fluid or a proportion of another fluid is desired to be intermixed with that admitted through the coupling 14, it only requires a manipulation of the members 16 and 26 to provide the desired mixture.

It will be observed that on the inward movement of the piston 17, the flap 23 of the member 18 will automatically seat; in fact, said members 23 of the members 20, 21 and 22 serve as check valves during the operation of the device.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. A hypodermic syringe including a syringe barrel provided with a discharge outlet, an outwardly opening check valve

controlling the fluid passage therethrough and provided adjacent the inner end of the barrel with a fluid inlet, an inwardly opening check valve controlling the fluid passage therethrough, a tubular piston reciprocably mounted within the barrel, an inwardly opening check valve controlling the passage of fluid into the barrel through the piston and constituting a piston packing, and means for interrupting the fluid flow through either or both of said barrel or piston inlets.

2. A hypodermic syringe including a syringe barrel provided with a tubular extension affording a discharge outlet, a valve for precluding the passage of fluid inwardly through the outlet, an adapter detachably secured to the tubular extension and provided with a valve controlled bleed channel opening to the atmosphere, a hypodermic needle carried by the adapter, and a piston reciprocably mounted within the barrel.

In testimony whereof I have signed my name to this specification.

GEORGE N. HEIN.