

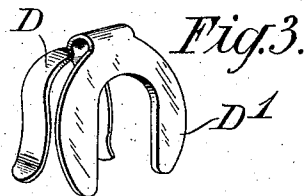
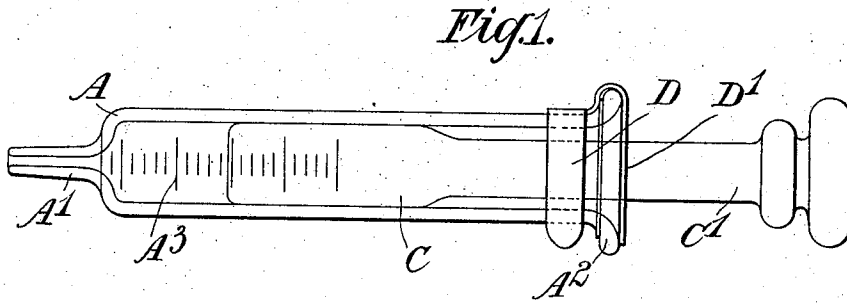
No. 772,114.

PATENTED OCT. 11, 1904.

V. PAPPENHEIM.  
SYRINGE.

APPLICATION FILED NOV. 20, 1903.

NO MODEL.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

VICTOR PAPPENHEIM, OF KASSEL, GERMANY.

## SYRINGE.

SPECIFICATION forming part of Letters Patent No. 772,114, dated October 11, 1904.

Application filed November 20, 1903. Serial No. 181,997. (No model.)

*To all whom it may concern:*

Be it known that I, VICTOR PAPPENHEIM, a subject of the King of Prussia, Emperor of Germany, residing at 47 Philosophenweg, Kassel, in the Empire of Germany, have invented certain new and useful Improvements in or Relating to Syringes, of which the following is a specification.

This invention relates to syringes, and has special reference to hypodermic and other syringes which are required to be aseptic, although its application is not limited thereto.

A syringe according to this invention is preferably made of glass, and the movable part of it consists of a rod having at one end and integral with it a piston ground to accurately fit the bore of the cylinder or barrel. The rod itself is of smaller diameter than the piston, so that it cannot in any position come into contact with the inner wall of the barrel or with the liquid therein, and the size of the piston is so proportioned to the length of the barrel that when in use no portion of the piston need emerge from the open end. This construction is of great importance, as it obviates the risk of any septic germs being conveyed from the outside to the inside of the syringe. To prevent the accidental separation of the parts and the consequent danger of breakage, a clip is provided, so formed that it can be readily attached to or disengaged from the barrel and while allowing the free motion of the piston-rod prevents the withdrawal of the piston itself.

In the accompanying drawings, which illustrate one construction of syringe according to this invention, Figure 1 shows the syringe in elevation with the point removed. Fig. 2 shows the injecting-point, and Fig. 3 is a perspective view of the clip.

Like letters indicate like parts throughout the drawings.

A is the cylinder or barrel of the syringe, provided at one end with a nozzle A', ground to fit a cap B, to which an injecting-needle is attached, and having at the other end a flange A<sup>2</sup>. The barrel is provided with graduations A<sup>3</sup>, indicating the volume of its contents. C is the piston, formed integral with the piston-rod C' and ground to fit the bore of the barrel

A. As will be seen in Fig. 1, the piston-rod C' is of smaller diameter than the piston C, and a considerable clearance is left between the rod and the inner wall of the barrel.

At the flanged end of the barrel A is a clip, comprising a springy portion D, which slips over and embraces the barrel just beneath the flange A<sup>2</sup>, and a slotted or horseshoe-shaped part D', which fits outside the flange, and while permitting the passage of the piston-rod C' prevents the withdrawal of the piston C. The clip D can be instantly removed from the syringe, and the piston can then be withdrawn from the barrel and all the parts readily cleansed and sterilized.

Although it is preferred to construct the barrel, piston, and piston-rod entirely of glass, it is to be understood that any other hard non-absorbent and readily-sterilizable material may be used. Again, the form of the clip may be varied without departing from the spirit of the invention, the essential feature being that it is readily removable and capable of keeping the barrel and piston from accidental separation.

In syringes having ground-in glass pistons as hitherto made the piston and piston-rod have been of uniform diameter, so that if when the piston was withdrawn for the purpose of charging the syringe the upper part came in any way into contact with septic germs those germs on the piston being pushed in would necessarily be brought against the inner wall of the barrel and infect it. Further, this construction made it impossible to provide a readily-removable clip for preventing the separation of the parts, and consequently breakages often occurred and valuable medicine was sometimes lost through the piston falling out. Many syringes have of course been constructed so that the piston could not be accidentally removed from the barrel; but this has generally been brought about by the employment of a screw-cap which could not be readily removed from the other parts of the syringe and by its construction was difficult to clean and provided many small recesses where dirt or germs could lodge. All these disadvantages are obviated in a syringe according to this invention. When in use, the

piston proper need never leave the barrel, and the piston-rod, reduced in diameter, never comes into contact with the inner wall. The clip effectually prevents the accidental separation of the piston and barrel and can be instantly detached and readily cleaned.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a syringe the combination of a barrel, a piston and piston-rod integral with each other, the piston-rod being of smaller diameter than the piston so as to be clear of the inner wall of the barrel and a removable spring-clip adapted to engage with the barrel and prevent the accidental separation of the barrel and piston, substantially as set forth.

2. In a syringe the combination of a barrel, a piston and piston-rod integral with each other, the piston-rod being of smaller diameter than the piston so as to be clear of the inner wall of the barrel and a clip comprising spring-arms to engage the outside of the bar-

rel and a slotted portion to prevent the accidental separation of the piston from the barrel substantially as set forth.

3. In a syringe the combination of a glass barrel, a piston and piston-rod also of glass and integral with each other, the piston-rod being of smaller diameter than the piston so as to be clear of the inner wall of the barrel, a flange on the barrel and a removable clip fitting on each side of the flange and comprising spring-arms D to engage the outside of the barrel and a slotted portion D' to prevent the accidental separation of the piston from the barrel substantially as set forth.

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

VICTOR PAPPENHEIM.

Witnesses:

ALFRED J. BUELT,  
HARRY B. BRIDGES.