

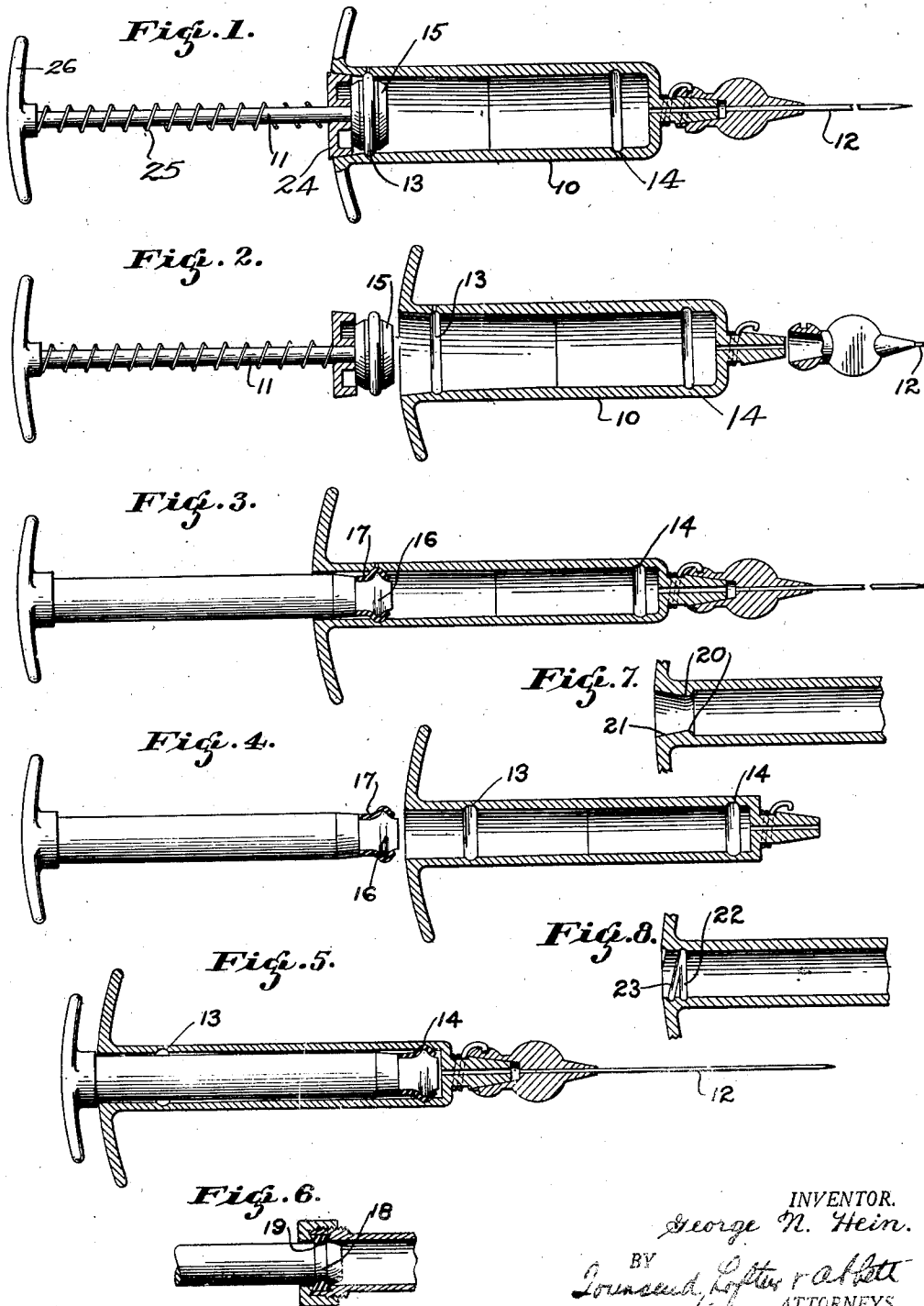
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G. N. HEIN

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SYRINGE

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INVENTOR.
George N. Hein.
BY
Lounsbury, Lofgren & Abbott
ATTORNEYS.

UNITED STATES PATENT OFFICE

GEORGE N. HEIN, OF SAN FRANCISCO, CALIFORNIA

SYRINGE

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This invention relates to syringes such as are used for hypodermic, irrigation, and other similar purposes.

The object of this invention is to improve the working qualities of hypodermic, irrigating, and other types of syringes, making it possible to take them apart for sterilization or replacement of parts, and also to assemble for use. This is brought about by the novel employment of one or more projections and depressions in the bore of the syringe barrels, which, when used in connection with a packing member, will retain said packing member in the desired location and also relieve tension on it and act as a seal for the contents of the syringe.

In the accompanying drawing,

Fig. 1 shows a central longitudinal sectional view of a syringe embodying my invention;

Fig. 2 shows a similar view with the plunger removed from the barrel;

Fig. 3 shows a central longitudinal sectional view of a modified form of the device;

Fig. 4 shows a similar view with the plunger removed from the barrel;

Fig. 5 shows a central longitudinal sectional view of a still further modification;

Fig. 6 shows a detail of a modified form of piston and barrel embodying my invention.

Fig. 7 shows a modified form of barrel, wherein a projection or bead is formed on the interior of the barrel.

Fig. 8 shows a further modification, in that the groove in the barrel is provided with a spiral entrance slot or groove to admit the piston.

Referring in detail to the accompanying drawing the syringe comprises a barrel 10, piston 11, and needle 12. The barrel is provided with a circumferential groove 13 at its outer end, as shown in Figs. 1 and 2, and in addition a similar groove 14 is provided at the inner end, as shown in Figs. 3, 4, and 5. The piston is provided with a head 15 which is formed with a bead 16 covered by an elastic packing ring 17 to co-operate with the grooves. As shown in Fig. 5, the barrel is preferably tapered, gradually diminishing in diameter from the outer groove to the

inner groove, so as to increase the friction when the plunger is moved inwardly.

In Fig. 6 I show a modification wherein a groove 18 is formed in the piston head and an elastic packing ring 19 is applied to the barrel.

The points of advantage over syringes now conventionally used are as follows:

First, establishment of a line of demarcation at the outer end of the barrel, by virtue of the groove 13. This registers to the operator when the piston has fully entered the chamber;

Second, a gradual taper in the bore of the syringe barrel from the line of demarcation 13 to a point distant from the piston chamber. This permits the easy ingress of the piston and free movement of the same during initial discharge of the syringe contents, thereby giving the operator full control of gradual ejection of medicaments, and preventing possible trauma and shock to the patient. When the syringe is filled through the needle end by the retraction of the piston, the abruptness of the outer portion of the line of demarcation registers clearly to the operator's hand, indicating that the syringe is completely filled.

Third, piston retention.

The construction of the line of demarcation as a groove serves to retain the piston in place and also seals the bore of the syringe barrel, permitting handling of the syringe in any position without danger of the piston dropping out, or loss of the syringe contents.

Fourth. The circumferential groove in the syringe barrel relieves pressure on the elastic packing member when the syringe is not in use, and also prevents the piston from falling out. After sterilization a syringe constructed with this groove may be assembled with the piston inserted full length, so as to be ready for instant use, and prevent possible contamination of the piston.

As shown in Fig. 7, the end of the barrel may have a bead or projection 20 to co-operate with the head of the piston. This bead or projection is beveled as shown at 21, so that the head of the piston may be inserted with greater ease.

In Fig. 8 I show an annular groove 22 in the end of the barrel, to co-operate with a projection on the piston head. There is a spiral slot or groove 23 leading from the open end of the barrel to the annular groove 22, so that the piston may be inserted with a turning movement.

In the form shown in Figs. 1 and 2 the stem 11 is slidably received in a plug 24 which fits within the barrel with a screw tapered seat and forms a closure for the barrel as well as a guide and bearing for the piston and its stem. The stem has coiled upon it a helical spring 25, one end of which abuts against the plug 24 and the other end against the grip member 26 on the end of the stem. This spring is expansible and serves to return the piston to its outermost position. By reason of the fact that it abuts against the plug 24, the piston upon striking the plug will not tend to dislodge the plug from its seat within the barrel, the force with which the piston strikes the said plug being neutralized by the pressure of the spring on the opposite side of the plug. In this way, a convenient, automatic return of the piston is provided, in combination with a smooth-fitting, removable plug for the end of the barrel, such a plug having decided advantages over the ordinary, threaded plug, which is slow and cumbersome to remove.

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

1. A syringe comprising a barrel, a movable piston, an elastic packing on the head of the piston, said barrel being provided with an indentation at its outer end and a similar indentation at its inner end, with which the head co-operates when at rest in fully extended or retracted position.

2. A syringe comprising a barrel and a movable piston, said barrel being provided with a groove in its outer end and a packing on the head of the piston to co-operate with said groove when at rest in fully extended position.

3. A syringe comprising a barrel and a movable piston, said barrel being provided with a groove near its outer end and a similar groove near its inner end, and a packing on the piston to co-operate with said grooves when at rest in fully extended or retracted position.

4. A syringe comprising a barrel and a sliding piston, said barrel being provided with a groove near its outer end and being tapered inwardly therefrom towards its inner end, and the head of the piston being provided with a packing to co-operate with said groove when at rest in fully extended position.

GEORGE N. HEIN.