

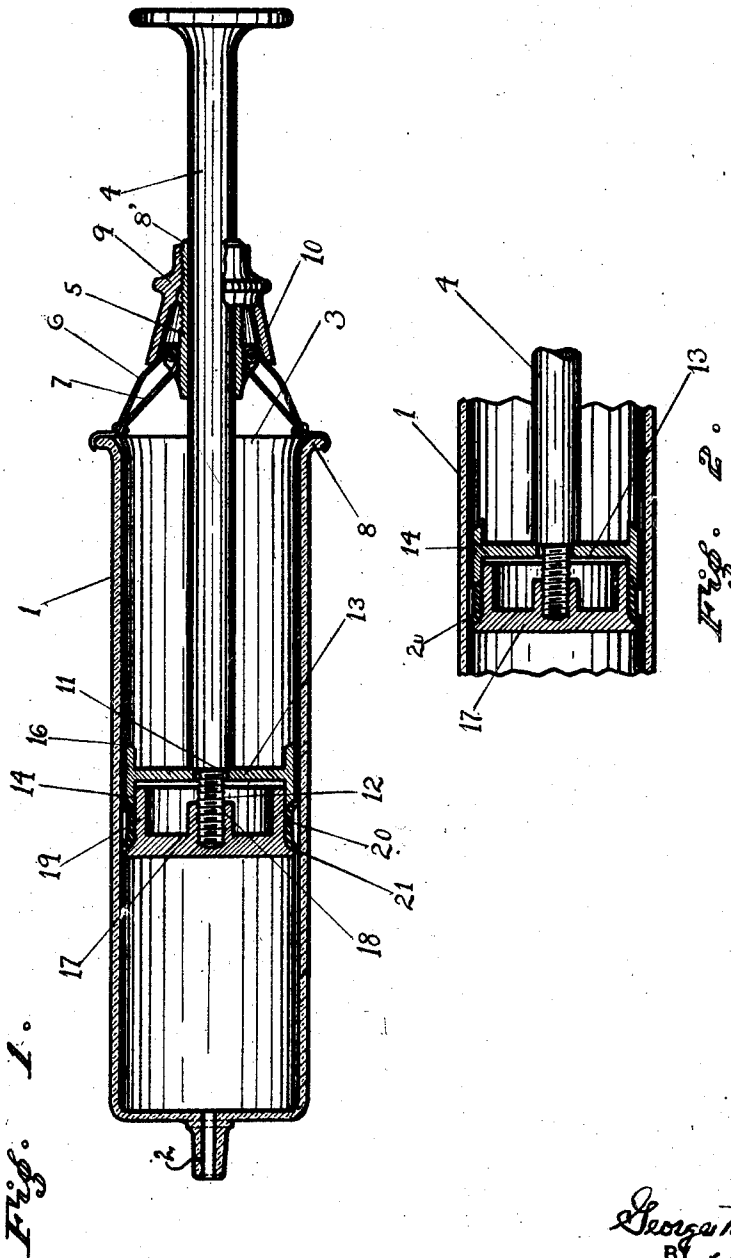
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ADJUSTABLE PISTON FOR SYRINGES

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UNITED STATES PATENT OFFICE.

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ADJUSTABLE PISTON FOR 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 at the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Adjustable Pistons for Syringes, of which the following is a specification.

The present invention relates to a syringe piston particularly designed to overcome the necessity of a ground fit between the piston surface and the syringe barrel of hypodermic syringes, which is now customary.

The invention further relates to the provision of a piston for hypodermic syringes which is capable of adjustment within the barrel to vary the friction against the barrel wall by simply turning or operating the piston head supporting rod, and further relates to a piston construction designed for adjustment to shape a piston packing to provide a pair of feathered edges projecting upwardly in contact with the barrel wall.

The present piston is designed and adjusted to fit the barrel of a syringe to expand and contract in its travel through the barrel and automatically adapts itself to varying diameters and irregularity of form in the shape of a barrel.

The invention consists primarily in a piston head formed of a pair of relatively telescopic members affording a mounting for a piston packing and adapted on their adjusting movement relatively to each other to position the packing carried thereby, so that either one or a plurality of portions thereof extend upwardly to provide a feather edge or lip for engaging the barrel wall.

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 drawings illustrating the preferred embodiment of my invention—

Figure 1 is a longitudinal central sectional view through a syringe containing one embodiment of my invention.

Figure 2 is a longitudinal sectional view

of the piston head with the follower in a position reversed to that illustrated in Figure 1.

In the drawings, wherein like characters of reference designate corresponding parts, 1 indicates a syringe barrel of any suitable type, preferably of glass, the same being provided at one end with a needle mounting tip 2 and open at its opposite end, as at 3, the type of barrel illustrated being of relatively large diameter adapted for containing 50 cc. of fluid.

Mounted to reciprocate within the barrel 1 is a rod 4 guided at the open end of the barrel 1 by a tubular guide 5 which mounts the pivotally supported barrel bead gripping fingers 6, each of which mounts a spring finger 7 contacting with the wall of the member 5. The fingers 6 are adapted for gripping the bead 8 at the upper open end 3 of the barrel 1, and the springs associated therewith maintain the fingers in raised position and prevent the same from dropping to a position to be received within the open end of the barrel 1.

The upper end of the tubular guide 5 is provided with a threaded boss 8' on which is mounted a clamp nut 9 having a flaring skirt 10 which, on the downward threading of the nut on the guide 5, is adapted to engage the walls of the fingers 6 and press the same inwardly against the action of the spring 7 to maintain the same in tight engagement with the bead 8. The outer end of the piston rod 4 is provided with an operating handle and the inner end thereof is reduced as at 11 and threaded as at 12.

Loosely positioned on the reduced end 11 of the rod 4 is a follower consisting of a disk 13 formed on its periphery with a wall 14 disposed at right angles to the plane of the disk. The wall projects beyond the opposite faces of the disk 13 and its ends are bevelled in parallel planes as at 16.

Threaded onto the threaded end 12 of the rod 4 is a piston head consisting of a disk 17 formed with a threaded boss 18 extending centrally from one face thereof, and said head is provided near its periphery with an annular skirt 19 for reception within the confines of the wall 14 of the follower 13.

The skirt 19 affords an annular seat for an elastic packing ring 20 positioned on the piston head to lie between one of the bevelled faces 16 of the follower 13 and the annular

inwardly bevelled face 21 formed on the piston head 17 and facing one of the portions 16.

The diameter of the follower 13 and of the piston head is less than that of the interior of the barrel.

It will be observed that the positioned elastic washer 20 is adapted at its forward edge, overlying the bevelled wall 21, to contact with the inner surface of the barrel. This frictional contact is at all times sufficient to preclude rotation of the piston head and packing within the barrel and to permit actual rotation of the rod 4 within the threaded boss 18.

When it is desired to vary the frictional contact of the washer with the barrel surface, it is only necessary* to impart axial rotation to the rod 4.

It will be observed that when the follower 13 and piston head are arranged as in the drawing, the opposite peripheral edges of the elastic packing 20 are caused to ride upwardly on the bevels 16 and 21 to provide two relatively thin feather edges contacting with the inside of the barrel wall. On the reversal of the follower from the position illustrated in Fig. 1, it will be observed that the inner edge of the elastic packing 20 will be precluded from moving outwardly and that the opposite edge will be forced outwardly on the bevel 21 and provided with a single annular surface or feather edge in contact with the barrel wall.

The reversibility of the follower affords means of providing a single or double contact seal between the packing and the barrel wall and the adjustability of the pressure of the packing against the barrel wall enables a quick variation of pressure necessary to operate the piston.

While the invention contemplates the employment of an elastic packing ring to be acted on by the piston head and follower, it is to be understood that in constructions where a ground surface is afforded by the inner wall of the barrel, a nonelastic or a metallic packing may be substituted for the elastic ring illustrated by the numeral 20.

I claim:—

1. A piston including a rod, a packing mounting structure carried thereby and consisting of a head threaded thereto and a rotatable follower held from longitudinal

movement thereon, said head and follower having laterally extended walls adapted for relative telescopic movement and provided with bevelled edges, and an elastic ring packing mounted on one of said walls between said bevelled edges whereby on the relative adjustment of said head and follower one edge of said packing will be curled outwardly.

2. A piston including a rod, a packing mounting structure carried thereby and consisting of a head threaded thereto and a rotatable follower held from longitudinal movement thereon, said head and follower having parallel annular walls disposed parallel with the rod and adapted for relative telescopic movement, said follower adapted for reversed positioning on said stem and the ends of its walls being bevelled in substantial parallel planes, said head provided with a bevel extending rearwardly from its outer peripheral surface, and an elastic packing ring mounted on said head between said bevelled surfaces.

3. In combination with a barrel, a piston reciprocally mounted therein and including a rod, a packing mounting structure carried thereby and consisting of two cooperating parts, one threaded for longitudinal movement thereon and both parts provided with annular bevelled surfaces, an elastic packing positioned around and gripping the part threaded to the stem with its surface in contact with the barrel, whereby on axial rotation being imparted to the rod relative telescopic movement will be imparted to said parts with the bevelled surfaces acting on opposite edges of the packing.

4. A piston including a rod, a head carried thereby and consisting of a pair of cooperating members one movable longitudinally of the rod to and from the other, an annular elastic packing, said members formed with opposing inclined circumferential faces and affording between the same a support for the packing, said faces adapted on the relative movement of said members to flex one edge of the packing to cause the same to curl outwardly beyond the periphery of the head and provide a thin annular flexible packing edge.

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

GEORGE N. HEIN