C. E. A. GRONBECH.

SYRINGE.

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1,348,796.

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Fig. 1.

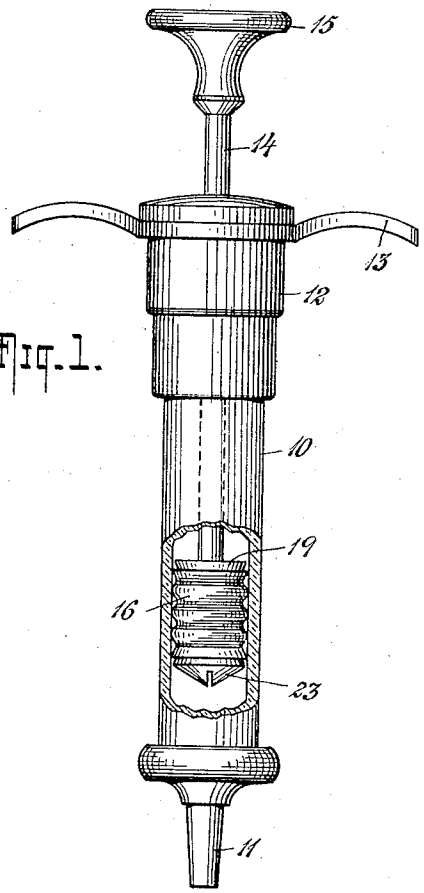
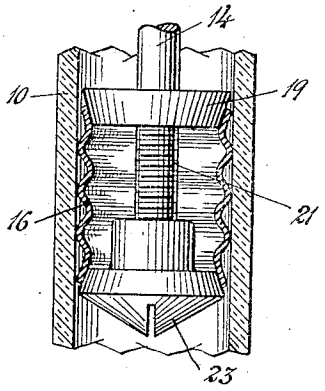


Fig. 2.



WITNESSES

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SYRINGE.

1,348,796. Specification of Letters Patent. Patented Aug. 3, 1920.

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To all whom it may concern:

Be it known that I, CHRISTIAN E. A. GRONBECH, a citizen of the United States, and resident of Woodhaven, Long Island, borough and county of Queens, city and State of New York, have invented certain new and useful Improvements in Syringes, of which the following is a specification.

My invention relates to surgical, medical and dental syringes, commonly termed hypodermic syringes, and more particularly to that type thereof in which the barrel is constructed of glass. The particular object of my invention is the provision of an improved piston construction in which compensation is made for inequalities of the inner surface of the barrel and for wear and in which a sliding fit of maximum efficiency between the barrel and the piston is secured throughout the life of the syringe.

My invention will be fully described hereinafter and the features of novelty will be pointed out in the appended claim.

In the accompanying drawings which, for illustrative and descriptive purposes, show an example of my invention, Figure 1 is a longitudinal section of a syringe including my improved piston; and Fig. 2 is a section, on an enlarged scale, of the piston in this form.

The syringe may comprise the barrel 10 of glass or similar material having the nozzle 11 for the accommodation of the customary hypodermic needle in the usual way, secured to one end and the cap 12 with the finger pieces 13 fastened to the other end. In all cases the syringe includes also the piston rod or stem 14 slidably mounted in the cap 12 and provided at its free end with the usual operating head 15; the inner end of this stem carries the piston in the well known way, said stem, with the operating head 15, constituting the medium whereby the piston is manipulated in the barrel.

In the illustrated example, the piston comprises a relatively thin shell of non-corrosive metal, that commonly known as Liberty silver being preferred, said shell being in the form of a corrugated tube 16 as shown in Fig. 2, with its opposite ends preferably converging outwardly and fitted respectively upon a member 19 and a nut 23, the surfaces of both of which converge inwardly to accommodate the ends of said tube 16.

The nut 23 is in screw-threaded connection with the stem 21 which projects from the member 19, the latter in turn being operatively connected with the piston rod or stem 14. It will be seen, that the shell tube 16 may be expanded outwardly into positive and firm frictional engagement with the inner surface of the barrel 10 by simply screwing the nut 23 up on the stem 21, this operation causing the member 19 and the nut 23 to approach each other. In this way the corrugated shell 16 is collapsed slightly in an axial direction and is thus caused to expand somewhat in a transverse direction whereby the shell 16 is caused to frictionally engage the inner surface of the barrel 10 at a plurality of points, each of which represents a fluid tight joint. Compensation for wear and physical changes in the metal or other material may thus be readily brought about, whereby a perfect sliding fit between the piston and the barrel 10 is assured at all times and regardless of any inequality in the glass of which the barrel is constructed.

The piston is simple in construction and economical to produce and at the same time is extremely efficient in operation. Because of the physical characteristics of my improved piston, it is equally well adapted for use with glass barrels in which the inner surface is ground or with glass barrels which have not been subjected to a grinding operation; in each case a perfect fluid tight fit is secured between the coöperating surfaces of the piston and the barrel regardless of any inequalities or irregularities in the latter. Wastage due to loss of material back of the piston, that is material which passes backward between the piston and the barrel as the piston is actuated, is thus avoided or at least reduced to a minimum; a syringe equipped with my improved piston is thus extremely economical. My invention provides the ideal combination of a glass barrel and a metallic piston at a low cost and in addition provides constructions whereby compensations for wear, physical changes in the piston or barrel or both may be easily accomplished, thus always insuring a syringe of maximum efficiency and usefulness.

While I believe my invention to be particularly adapted for use in combination with barrels of glass or the like, it is obvious that it may also find usefulness in con-

nection with barrels constructed of metal and other substances.

Various changes in the specific forms shown and described may be made within the scope of the claim without departing from the spirit of my invention.

I claim:

In a syringe, the combination of a glass barrel, a piston comprising a corrugated, tubular, metallic shell and devices at opposite ends thereof, said devices being adjustable toward each other whereby said shell is transversely expanded and means for actuating said piston.

In testimony whereof I have hereunto set my hand.

CHRISTIAN E. A. GRONBECH.