

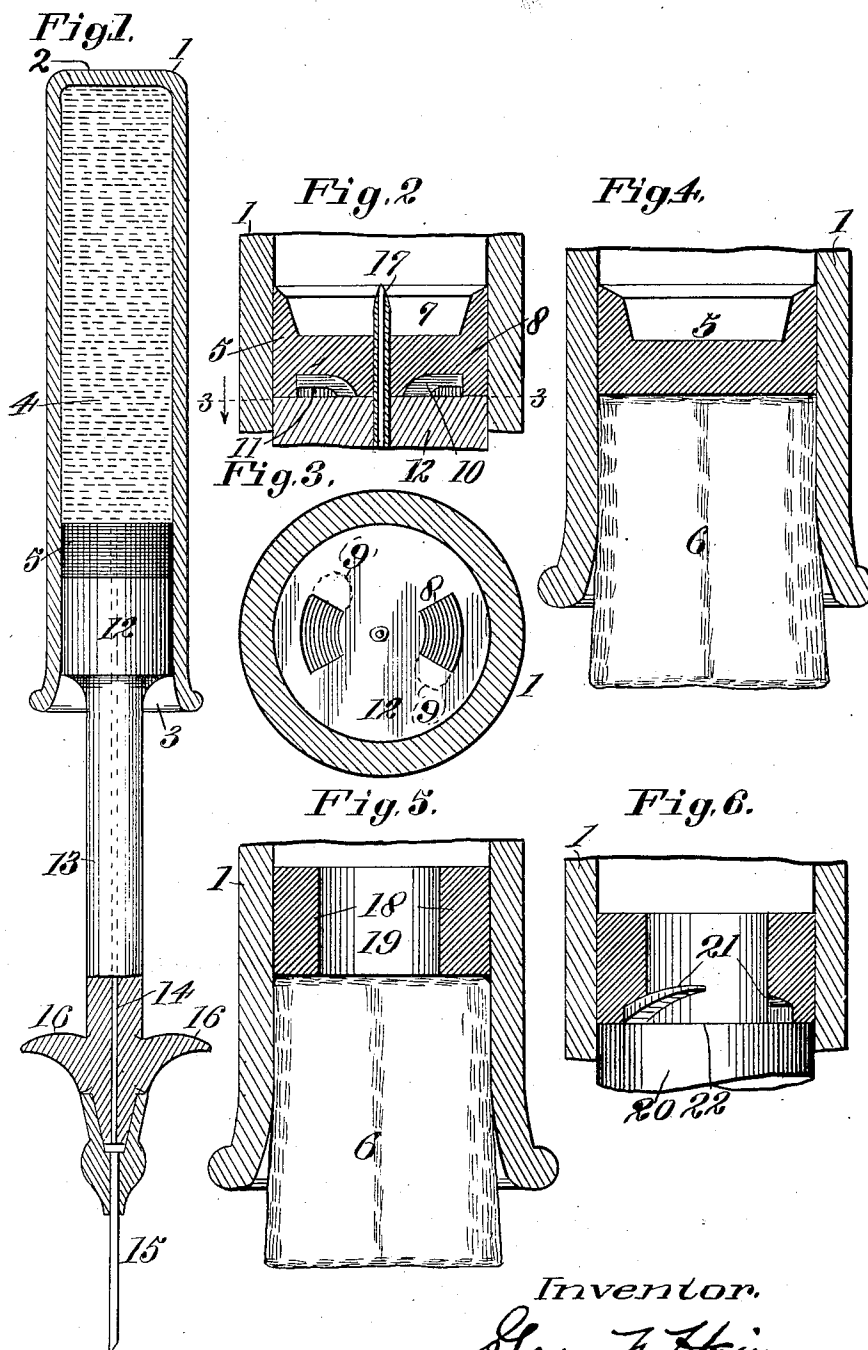
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HYPODERMIC SYRINGE CONSTRUCTION

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UNITED STATES PATENT OFFICE.

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HYPODERMIC-SYRINGE CONSTRUCTION.

Application filed December 23, 1924. Serial No. 757,656.

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 Hypodermic-Syringe Constructions, of which the following is a specification.

The present invention relates to an injecting apparatus more particularly a hypodermic syringe and to a construction of phial and piston adapted for cooperation to provide a syringe structure.

One of the objects of the present invention is to provide an elastic member longitudinally movable within a phial and through which the phial contents are forced, and to provide said member with means whereby the same may be moved rotatively relative to the phial to break or release its peripheral wall therefrom.

To provide a closure of the type above specified which is designed for affording a packing for the piston employed in connection with the phial; to provide a sealing structure designed for detachably securing to the piston and adapted to remain in its adjusted position within the phial after the required desired contents have been forced from the phial.

Another object is to provide a structure having means associated therewith whereby detachable engagement between the sealing member and piston end can be afforded.

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.

To more fully comprehend the invention, reference is directed to the accompanying drawings, wherein—

Fig. 1 is a longitudinal sectional view of the preferred embodiment of my invention.

Fig. 2 is a view in detailed section of the sealing member and piston in cooperating relation.

Fig. 3 is a transverse sectional view on line 3—3 of Fig. 2, illustrating particularly

the opposing fingers or engaging members on the end of the piston.

Fig. 4 is a view of a phial mouth with a sealing member therein, the member being fortified with a cork.

Fig. 5 is a view of a modified form of construction illustrating a tubular sealing member.

Fig. 6 is a view of a modified form of piston adapted for use in connection with the tubular sealing member.

In perfecting the present invention it has been discovered that by the use of medical liquids in ampules or phials, wherein a portion of the closure is utilized as an expelling means, the closure side walls often tenaciously adhere to the side walls of the phial or ampule and can only be broken therefrom by considerable inward or reciprocating pressure, which pressure causes a sudden discharge of the fluid contents from the phial or ampule and the sticking of the closure precludes a free and easy continuous discharge of the medicament.

To overcome this objection it has been discovered that if a slight rotative action be imparted to the closure or sealing member to release the adhering points of its peripheral surface from sticking to the phial wall, that an easy, continuous flow of the medicament at any desired speed may be maintained, and to accomplish this purpose I have illustrated the embodiment of the invention which I prefer.

In the disclosure, 1 indicates a glass phial, preferably of cylindrical construction, closed at one end as at 2 and open at its opposite end as at 3. The phial is supplied through its open mouth with the desired quantity of fluid medicament 4 and when an elastic or yieldable member 5 is inserted into the mouth of the phial through its open end, and the open end of the phial is further closed, preferably by a cork 6.

The inner face of the member 5 carries an annular skirt 7 and the outer face is formed with a pair of oppositely disposed depressions or pockets 8, under the overhanging edges 9 of which are adapted for reciprocation the oppositely disposed hook portions 10 carried by the end 11 of the piston head 12. The head 12 is on the inner end of a piston 13 provided with a bore or channel 14 extending longitudinally thereof, and said piston mounts at its opposite end a conventional form of hypodermic needle

construction 15, and is provided with finger grip portions 16. From the inner end of the head 12 in alignment with the bore 14 extends a tubular needle 17 adapted to puncture the closure 5 as in Fig. 2.

When it is desired to utilize this structure, the phial 1 is held in an upright position and the cork 6 is removed therefrom. The sterilized head 12 of the piston 13 is inserted into the mouth of the phial with the hooked members 10 in alignment with the depressions 8. When the hooked members are received within the depressions relative rotation is imparted to the phial 1 and piston 13. This causes a relative rotation of the sealing member 5 and breaks any adhering contact between its peripheral edge and the inner surface of the phial. On the interlocking of the piston head with the sealing member 5, the needle 17 has been forced through the sealing member 5 and has communication with the contents of the phial. With the finger grip 16 held with the fingers and thumb pressure being applied to the end 2 of phial 1 relative telescopic movement is had between the phial and piston, and the phial contents are discharged through the bore 14.

After the required quantity of the contents has been discharged, it is possible to disconnect the head 12 from the sealing member 5 by imparting a reverse rotation thereto, at which time the elasticity of the member 5 will fill the puncture made by the needle 17 and the contents of the phial is again sealed from atmospheric action until further used.

In the modified construction, Figs. 5 and 6, I provide a sealing member in the form of a flexible ring 18, the port 19 in which overcomes the necessity of puncturing the ring and enables the employment of a piston head 20 of relatively flat construction.

In this type of device, a detachable fastening between the piston head 20 and ring 18 is accomplished by the spiral screw members 21 projecting from the face 22 of the piston head and adapted to engage the wall surface of the opening 19. When this modified construction is provided and employed, the use of the cork 6 is imperative at all times when the piston head is removed from the phial.

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

1. In combination with a phial, an imperforate elastic sealing member within the same and extending transversely thereof with its edges frictionally engaging the phial wall, said elastic member on one side provided with a plurality of depressions, a piston for reciprocation within the phial, and means carried by the end of the piston for

reception within said depressions to impart to said elastic member axial rotation and longitudinal reciprocation in either direction within the phial.

2. In combination with a phial, an imperforate elastic sealing member within the same and extending transversely thereof with its edges frictionally engaging the phial wall, said elastic member on one side provided with a plurality of depressions, a piston for reciprocation within the phial, and a pair of laterally extended members on the end of the piston for reception within said depressions to impart to said elastic member axial rotation and longitudinal reciprocation in either direction within the phial.

3. In combination with a phial an imperforate elastic sealing member within the same and extending transversely thereof with its edges frictionally engaging the phial wall, said elastic member on one side provided with a plurality of depressions, a piston for reciprocation within the phial, and interengaging means carried by the piston for reception within said depressions for releasable engagement by a relative rotary movement to impart to said elastic member axial rotation and longitudinal reciprocation in either direction within the phial.

4. In combination with a phial, an elastic sealing member within the same and disposed transversely thereof, with its periphery in frictional contact with the phial wall, a tubular piston for reciprocation at one end within the phial and with its end in cooperation with the elastic member, a tubular needle associated with the piston for puncturing said elastic member, and means for detachably securing the elastic member and piston end together to impart to said elastic member axial rotation and longitudinal reciprocation in either direction within the phial.

5. In combination with a phial, an elastic sealing member within the same and disposed transversely thereof, with its periphery in frictional contact with the phial wall, a tubular piston for reciprocation at one end within the phial and with its end in cooperation with the elastic member, a tubular needle associated with the piston for puncturing said elastic member, means for detachably securing the elastic member and piston end together, and interengaging means associated with the piston end and elastic member whereby axial rotation and longitudinal reciprocation in either direction may be imparted to the elastic member within the phial.

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

GEORGE N. HEIN.