

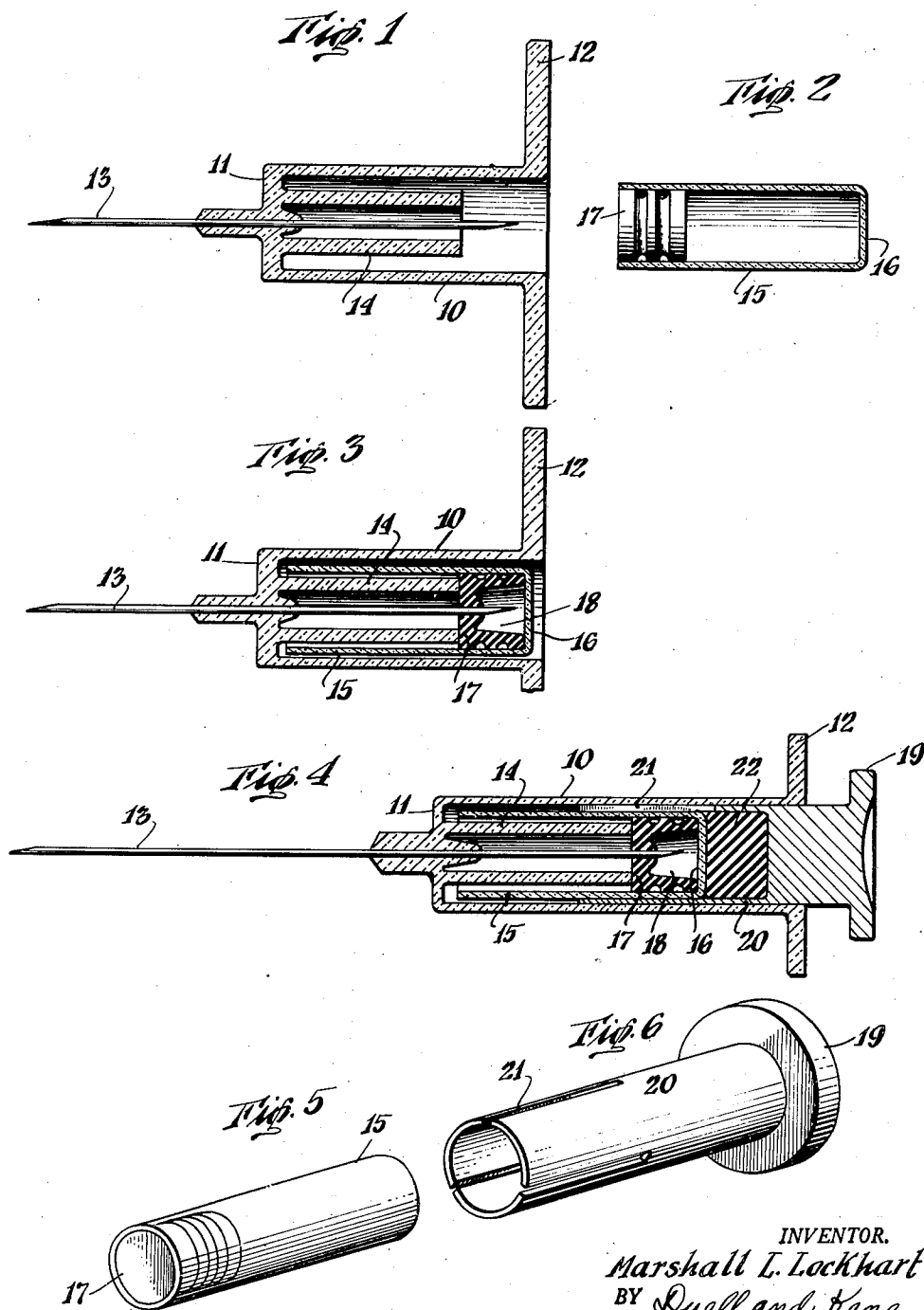
Dec. 6, 1949

M. L. LOCKHART

2,490,447

SYRINGE ASSEMBLY

Filed Jan. 23, 1947



INVENTOR.
Marshall L. Lockhart
BY Duell and Kane

ATTORNEYS

UNITED STATES PATENT OFFICE

2,490,447

SYRINGE ASSEMBLY

Marshall L. Lockhart, Rutherford, N. J.

Application January 23, 1947, Serial No. 723,812

1. Claim. (Cl. 128—220)

1 This invention relates to a structurally and functionally improved syringe assembly of the hypodermic type and especially an assembly such as is generally described and illustrated in my prior United States Patent 2,410,351 of October 29, 1946.

It is an object of the invention to furnish an assembly of this type and in which—if desired—the parts may only be used for a single injection, after which they must be discarded. Such an assembly is especially desirable in connection with some types of injections and the use of medicaments having certain characteristics.

A further object is that of furnishing a syringe assembly in which—quite independently of a "one-time" use as set forth in the preceding paragraph—a cartridge or ampule of a single ended type may be employed. In such employment, the operator will have the assurance that a complete discharge of the contained medicament will be effected from the cartridge.

Still another object is that of designing a structure such that should a reuse of the syringe be desired, then the discharged ampule or cartridge may be removed from association with the syringe.

Another object is that of providing a structure which will guard against danger of cartridge or ampule breakage even if excessive thrust has to be employed to assure a dispensing of the injection.

An additional object is that of designing a layout of apparatus, the individual parts of which will be relatively rugged and capable of manufacture by quantity production methods so that the cost of the assembly will be capable of being maintained at a relatively low figure.

With these and other objects in mind, reference is had to the attached sheet of drawings illustrating practical embodiments of the invention and in which:

Fig. 1 is a sectional side view of a holder or syringe;

Fig. 2 is a similar view of a cartridge or ampule;

Fig. 3 shows the holder and ampule in cooperating relationship;

Fig. 4 is a view similar to Fig. 3 but showing an alternative proportioning of the holder parts and an operating element used in conjunction with the cartridge or ampule;

Fig. 5 is a perspective view of such a cartridge; and

Fig. 6 is a similar view of a desirable form of operating element.

Referring primarily to Fig. 1, there has been illustrated a holder or syringe which conveniently

2 includes a barrel or body 10 having a closed end wall 11 and—if desired—outstanding finger engaging portions or wings 12. Disposed centrally of this body and extending through the end wall 11 is a needle 13, both ends of which are sharpened. A thrust portion 14 is concentrically disposed with respect to the inner end of the needle. This thrust portion is shorter than the inner end of the needle so that the latter extends beyond the same.

In Fig. 2 an ampule has been illustrated which includes a body 15 conveniently formed of glass. One end of this body is closed by an end wall 16. The opposite end of such body is sealed by a stopper 17 so as to retain the contained medicament. It will be observed that the overall length of the ampule or cartridge body is substantially equivalent to or even less than the depth of the body or holder 10. Also it will be noted that only a single compartment is incorporated in the ampule or cartridge in the device as illustrated.

It is apparent that if an injection is to be achieved, then the stopper end of the ampule may be inserted into the bore of the body 10 to a point where the needle is in contact with, or has penetrated the end wall of the stopper and has entered the bore 18 thereof. At the same time the outer end of the needle 13 may be caused to penetrate the skin and underlying tissue. Thereupon, by applying pressure against the end wall 16 of the ampule, the latter is projected into the bore of the holder 10. With such projection, the thrust portion 14 will engage the end of the stopper and shift the same rearwardly within the cartridge or ampule. Therefore, the medicament contained within the latter will be ejected through the bore of the needle. Continued projection of the ampule will result in the parts reaching the positions illustrated in Fig. 3.

In that view it will be observed that substantially all of the medicament has been ejected from the cartridge. The latter will now occupy a position wholly within the bore of the holder. It will be retained in that position by virtue of the frictional contact between the stopper body and the needle. Obviously, it will be difficult if not impossible to withdraw the cartridge from such position. This will be increasingly true according to the degree of projection of the ampule. Therefore, with such proportioning of the parts a structure is furnished which will only have a one-time use. After such use, it will be discarded.

Next referring to Fig. 6, an actuating element has been shown which conveniently includes a head or thumb engaging portion 19 and a reduced

body 20. The latter may conveniently be formed of metal having resilient characteristics. If desired, slits 21 may be formed in the cylindrical body 20 so as to provide yielding gripping portions. Accordingly, even if ampules vary slightly in diameter, they may be accommodated within the body 20. The base of the bore defined by that body may have a plug or layer 22 of yielding material disposed upon it.

In certain instances it has been found that excessive pressures must be employed to effect a dispensing of the injection. This is especially true where the medicament is a relatively heavy fluid. In such cases and if the ampule be constructed of a rupturable material such as glass, then there is always danger that this cartridge may burst. As will be understood with an actuating element such as 20, the walls of the cartridge will be reinforced to prevent this bursting. If, nevertheless, such a result should obtain, then the operator will not be injured nor will the medicament be likely to come into contact with garments.

Additionally and quite aside from any accidental breaking or bursting, it will be practicable to withdraw the ampule or cartridge from the holder as illustrated in Figs. 3 and 4. Thus, assuming that it is desired to reuse the syringe assembly, this will be feasible even if the cartridge or ampule has been fully discharged. In other words, in such event the operator may, either prior to the application of the cartridge with the syringe or even after the discharge of the medicament, associate the actuating element 20 therewith. The engagement between this element and the outer face of the cartridge will be such that the latter may be readily withdrawn despite the frictional engagement existing between the stopper and needle.

Thus among others, the several objects of the invention as specifically aforenoted are achieved. Obviously, numerous changes in construction and rearrangements of the parts may be resorted to without departing from the spirit of the invention as defined by the claim.

What I claim is:

A syringe assembly including in combination an ampule comprising a tubular body, a wall at the outer end of said body, a stopper initially disposed adjacent the inner end of said body to retain medicament therein, a tubular holder open at one end to receive therethrough the inner end and body of the ampule, a wall closing the opposite end of said holder, a double ended needle extending through said wall, a thrust portion also extending from said wall and of a height less than the adjacent needle end and terminating from the open end of said holder a distance at least equal to the length of said stopper, the length of said ampule being not in excess of the depth of said holder whereby, with pressure exerted by the thumb against the outer wall of the ampule body, the latter may be projected within said holder to a point where the ampule is contained within said holder and an actuating element insertible through the open end of said holder into telescopic relationship with respect to the end of the ampule body, said actuator comprising a tubular body of a diameter such that the ampule may be received therein and said body being formed with slits to incorporate yieldingly gripping portions aligned and in contact with the outer face of said ampule.

MARSHALL L. LOCKHART.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,848,711	Hall	Mar. 8, 1932
2,175,365	Saffir	Oct. 10, 1939

FOREIGN PATENTS

Number	Country	Date
17,069	Great Britain	Of 1909