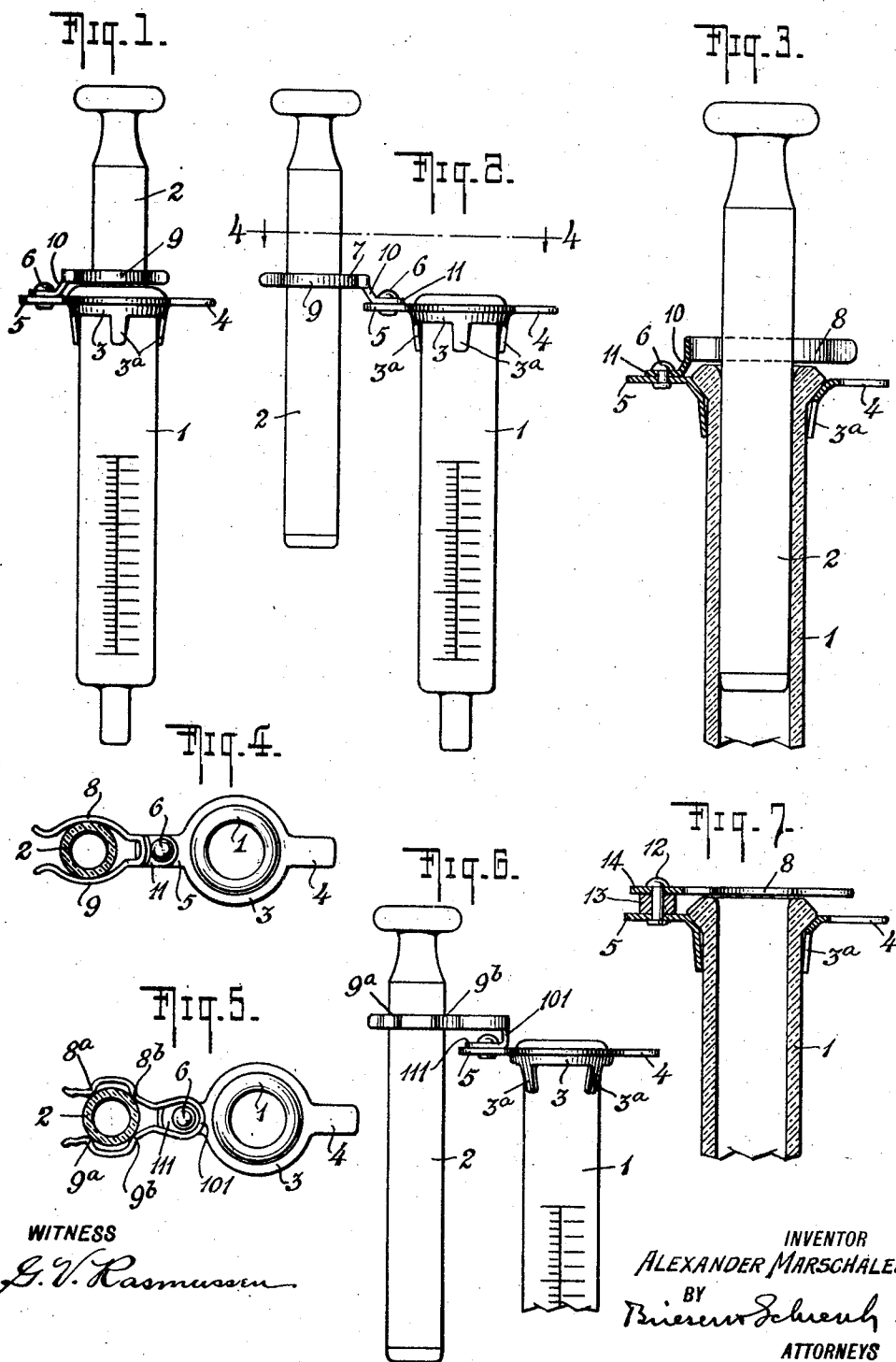


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PLUNGER CLIP FOR SYRINGES

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PLUNGER CLIP FOR SYRINGES.

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This invention relates to syringes for medical use and has for an object to provide a construction wherein the plunger is held automatically in any desired position.

5 Another object of the invention is to provide in a medical syringe, a clip adapted to hold the plunger of the syringe against accidental movement either in the barrel of the syringe or in the sterilizer.

10 A further object of the invention, more specifically, is to provide a clip connected with the barrel of a syringe formed to grip the plunger of the syringe and to hold the same in any adjusted position within the
15 barrel and also hold the same against loss when positioned exteriorly of the barrel for sterilizing purposes.

This application is in part a continuation of applicant's application for United States
20 Letters Patent Serial No. 11,812, filed February 26, 1925.

In the accompanying drawing—

Figure 1 is a side view of a syringe and clip, embodying the invention.

25 Figure 2 is a view similar to Figure 1 but showing the plunger held away from the barrel whereby the parts may be properly sterilized without either being lost.

30 Figure 3 is a longitudinal vertical sectional view through the upper part of the structure shown in Figure 1, the same being on an enlarged scale.

Figure 4 is a sectional view through Figure 2, on line 4—4.

35 Figure 5 is a fragmentary sectional view similar to Figure 4 but showing a modified and preferred form of clip.

Figure 6 is a side elevation of the preferred form of clip shown in Figure 5.

40 Figure 7 is a view similar to Figure 3 but showing a modified construction of clip.

Referring to the accompanying drawings by numerals, 1 indicates the barrel of a syringe and 2 the plunger. Connected to
45 the upper part of barrel 1 is a metallic fitting 3 of any usual or preferred form but preferably (as indicated in Figures 2 and 7) constructed in a manner to exert a resilient frictional clamping action on said barrel
50 sufficient to prevent unintentional movement of said fitting lengthwise thereof and so as to have an engagement with said barrel whereby any tendency of the fitting to cant or tilt relatively to the major axis thereof is re-

sisted, said fitting further being adapted to
55 be engaged by the fingers when the syringe is being used. In the illustrated example the above mentioned results are secured by constructing the fitting 3 in the form of an
60 annular fitting member mounted upon the barrel 1 and provided with resilient members 3^a which project from said fitting member in the direction of the length of the
65 barrel 1 and into resilient but firm frictional engagement therewith. It will be noted that the fitting 3 is provided with arms 4 and 5. The arm 5 carries a rivet 6 which
70 acts as a journal pin for the clip 7. The clip 7 acts as automatic means for holding the plunger 2 in different adjusted positions and always in association with the barrel 1.
75 This is very desirable as the bore of barrel 1 is ground to receive the plunger 2 and, therefore, will not properly receive any other plunger which may be of substantially the same size.

Heretofore, in sterilizing the plunger and barrel, extra care had to be used in order to keep the two members together or properly tagged so that they could be re-assembled.
80 Also, it has been found that the plunger will move back out of the barrel when the barrel is inverted accidentally. This results in loss by breakage or loss of the fluid to be injected. By providing the fitting 3 with the
85 resilient members 3^a and the clip 7, means are presented which will hold the barrel and plunger in constant association as shown in Figure 2. The clip 7 will thus automatically lock or hold the plunger in any desired
90 adjusted position either within the barrel (Figure 3) or outside of the barrel (Figure 2) and in either case without displacing the fitting 3 from its proper position with respect to the barrel 1.

95 The clip 7 is preferably stamped from a single piece of metal and in stamping is provided with resilient arms 8 and 9 and an upstanding neck 10 which merges into a flat section 11 through which the rivet 6 extends. The normal position of the arms 8
100 and 9 is such that the space therebetween is less than the diameter of the plunger 2 so that whenever the plunger is forced between these arms it will be held by friction in
105 different positions. When the clip is holding the plunger in the position shown in Figure 1 for instance, the syringe may be

turned upside down or arranged in any position without fear of the plunger moving out of the barrel.

When it is desired to sterilize the plunger and barrel, the parts are arranged substantially as shown in Figure 2 and then placed in a sterilizing apparatus the desired time. When it is desired to again use the syringe, both barrel and plunger will be removed simultaneously and always the correct plunger will be present for use with its corresponding barrel.

A modification of the invention, having special features of advantage, is illustrated in Figures 5 and 6. In these figures the arms 8 and 9 are formed integrally with a reverse bend 101 and a flat section 111 and are provided with a plurality of spaced projecting elements 8^a, 8^b, 9^a, 9^b. These projecting elements establish the spring contact with the surface of the plunger and the use of such projecting elements causes the clip as a whole to present a materially less area of surface contact with the plunger than is the case in the structure shown in Figure 4. The resultant spacing of the surface of the clip from that of the plunger, except at a minimum number of contact points, permits a more thorough sterilization of the plunger in the sterilizing apparatus, while a slight twist of the plunger as it is held by the clip during the sterilization period will expose to sterilization treatment the points of the plunger formerly in contact with parts of the clip. Even if the plunger is not slightly rotated as suggested, the sterilization will obviously be more complete than where the plunger is held in the manner shown in Figure 4. Although the spacing of the clip from the plunger in the manner shown in Figure 5 reduces the area of surface contact between the clip and the plunger and consequently tends to lessen the resilient gripping power of the clip, it has been found that a structure such as illustrated in Figures 5 and 6 not only has adequate gripping power but by virtue of the diminution of the gripping force has additional advantages. Thus when the plunger is in the barrel and is used by the physician a relatively powerful grip of the clip against the plunger interferes with the easy manipulation of the plunger within the barrel which the physician desires. When the clip is however formed as shown in Figures 5 and 6 it not only minimizes resistance against easy manipulation of the plunger but at the same time retains adequate gripping power to maintain the plunger at any desired point within the barrel, even though the instrument may be laid down or turned upside down, and also to maintain the plunger in the clip tightly enough for the sterilization operation when the plunger is not within the barrel, but is held adjacent thereto.

This softening of the resistance is accomplished by using the spaced projections 8^a, 8^b, 9^a, 9^b, but is still further enhanced by the special clip structure clearly shown in Figure 6. It will be noted from that figure that the arms of the clip have their points of flexure nearer the center of the barrel of the syringe and farther from their free ends than the spring arms 8 and 9 of Figure 4, giving those arms a softer resilient action due to their increased length. This softer resilience serves to further modify any excessive gripping effect of the arms. The modification shown in Figures 5 and 6 is, therefore, one which, possessing special advantages, constitutes the preferred form of the device.

Instead of forming the clip in one piece as shown in Figure 1, it might be made in some other manner without departing from the spirit of the invention, as for instance, in the manner shown in Figure 7. In this figure, the rivet 12 extends through arm 5, bushing 13 and the extension 14 projecting from the juncture of the arms 8 and 9. The function of the arms 8 and 9 in this form of the invention is identical with the function of the arms in the other form of the invention, the only difference being the fact that the arms in this form of the invention in the extension 7 are stamped from flat sheet material and are all arranged in the same plane. This necessitates the bushing 13 and an extra long rivet 12.

What I claim is:

1. The combination with a syringe provided with a plunger and barrel, of means for holding the plunger against accidental movement while in the barrel or holding the plunger out of the barrel but adjacent thereto, said means including a pair of gripping arms, and means for pivotally mounting said arms on said barrel so that it may swing at a right angle to the barrel whereby the arms may be swung to grip the plunger while in the barrel and swung to a different position to grip the plunger when out of the barrel.

2. A clip for syringes, comprising a pair of resilient arms connected together at one point and provided with an extension at said point, and means for pivotally connecting said extension to the barrel of said syringe so as to swing in a plane at right angles to the said barrel, said arms being adapted to grip the plunger and hold the same in different adjusted positions.

3. A clip for syringes, comprising a pair of resilient arms formed from a single piece of resilient metal whereby said arms will produce a resilient gripping action, said arms merging together at one point, means projecting from the point where said arms merge together, said means presenting an extension, and a rivet extending through

said extension and part of the syringe for pivotally mounting the arms in position.

4. A clip for syringes, comprising a pair of arms joined together at one point, means projecting from the point where said arms are joined together, said means presenting an extension, and a rivet extending through said extension and part of the syringe for pivotally mounting the arms in position.

5. The combination with a syringe provided with a plunger and barrel, of means for holding the plunger against accidental movement while in the barrel or holding the plunger out of the barrel but adjacent thereto, said means including a fitting frictionally seated on the barrel, a pair of gripping arms, and means for pivotally mounting said arms on said fitting so that they may swing to a position of rest at a right angle to the barrel whereby the arms may be swung to grip the plunger while in the barrel and swung to a different position to grip the plunger when out of the barrel without displacing the fitting from its proper position on the barrel.

6. The combination with a syringe provided with a plunger and barrel, of means for holding the plunger against accidental movement while in the barrel or holding the plunger out of the barrel but adjacent thereto, said means including a fitting provided with spaced resilient gripping fingers extending lengthwise of the barrel and frictionally positioning the fitting firmly on the barrel, a pair of gripping arms, and means for pivotally mounting said arms on said fitting so that they may swing to a position of rest at a right angle to the barrel whereby the arms may be swung to grip the plunger while in the barrel and swung to a different position to grip the plunger when out of the barrel without displacing the fitting from its proper position on the barrel.

7. A clip for syringes, comprising a fitting provided with resilient gripping fingers to frictionally position the fitting firmly on the barrel of the syringe, a pair of resilient arms connected together at one point and provided with an extension at said point, and means for pivotally connecting said extension to said fitting so as to enable the resilient arms to be swung to a position of rest in a plane at right angles to the barrel, said arms being adapted to grip the plunger and hold the same in different adjusted positions in the barrel and to grip the plunger when

out of the barrel without displacing the fitting from its proper position on the barrel.

8. The combination with a syringe provided with a plunger and barrel, of means for holding the plunger against accidental movement while in the barrel or holding the plunger out of the barrel but adjacent thereto, said means including a fitting frictionally seated on the barrel, a pair of gripping arms, a plurality of spaced projecting elements associated with said gripping arms and adapted to establish contact with the surface of the plunger, and means for pivotally mounting said arms on said fitting so that they may swing to a position of rest at a right angle to the barrel whereby the arms may be swung to grip the plunger while in the barrel and swung to a different position to grip the plunger when out of the barrel without displacing the fitting from its proper position on the barrel.

9. A clip for syringes comprising a pair of resilient arms connected together at one point and provided with a bent integral extension at said point, said bent extension comprising a portion substantially parallel to the axis of the syringe and a portion extending in the general direction of the free end of the resilient arms, and means for pivotally connecting said latter portion to the barrel of the syringe so as to swing in a plane at right angles to the said barrel, said arms being adapted to grip the plunger and to hold the same with a gentle frictional pressure in different adjusted positions.

10. A clip for syringes comprising a pair of resilient arms, a plurality of spaced projecting elements associated with said arms and adapted to establish contact with the surface of the plunger, said arms being connected together at one point and provided with a bent integral extension at said point, said bent extension comprising a portion substantially parallel to the axis of the syringe and a portion extending in the general direction of the free end of the resilient arms and means for pivotally connecting said latter portion to the barrel of the syringe so as to swing in a plane at right angles to the said barrel, said arms being adapted to grip the plunger between the above named projections and thereby to hold the plunger with a gentle frictional pressure in different adjusted positions.

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