

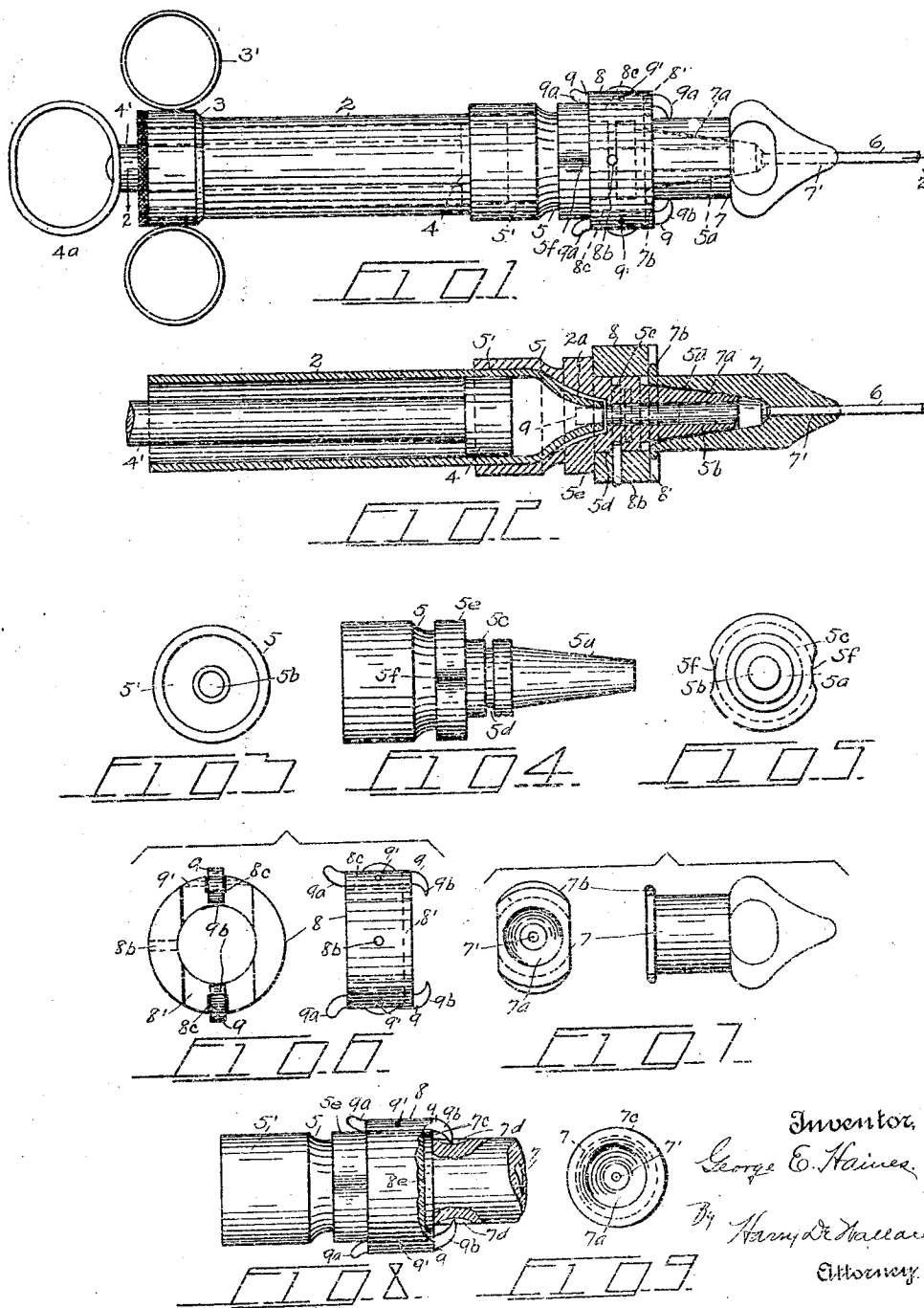
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MEANS FOR SECURING HYPODERMIC NEEDLE MOUNTS

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MEANS FOR SECURING HYPODERMIC-NEEDLE MOUNTS.

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This invention relates to means for securing needle-mounts to syringes, designed particularly for use in connection with hypodermic and other hollow needles of the type known as "slip-on" needles.

The object of the invention is to provide novel, simple, quick-acting and positive fastening means, by which the needle-mount may be detachably secured to the "tip" or "male slip" with which certain well-known types of hypodermic syringes are equipped. A further object is to provide a novel adapter or slip, which is formed at one end with a socket, in which the barrel of the syringe may be permanently seated, the opposite end of the adapter comprising a cone-shaped prolate, which telescopes and conforms to the correspondingly tapered body of the needle-mount, and effects the pressure or liquid seal required for syringes of the class; the said adapter being provided medially with circumferential cam-portions which effect the locking of the needle-mount in the operative position. A further object is to provide a sleeve or coupling which is rotatably supported by the adapter, the said coupling being arranged to interlock with the needle-mount, and being equipped with a plurality of rockable dogs or grips, which are normally in contact with and are actuated by the cam-portions of the adapter, the said dogs being arranged to simultaneously grip the needle-mount for preventing accidental loosening of the pressure tight joint or release of the needle-mount from the adapter, by the partial rotation of the mount and the said coupling. And a further object is to provide a syringe of the hypodermic type wherein all of the detachable parts may be assembled pressure-tight, and wherein the needle and its mounting may be positively locked to the prolate cone of the adapter, without danger of the needle and its mount becoming detached, especially when the syringe is being used in the mouth or throat of a patient.

The various features and parts of the invention will be understood from the detailed description which follows, and by reference to the accompanying drawing, in which—

Figure 1 is a side elevation of one type of hypodermic syringe, to which my improvement may be applied; showing the needle-mount securely locked to the adapter.

Fig. 2 is a longitudinal section, taken on line 2—2 of Fig. 1. Fig. 3 is a rear end view of the adapter. Fig. 4 is a side elevation of the same. Fig. 5 is a front end view of the adapter. Fig. 6 is respectively a side and a front end elevation of the annular coupling. Fig. 7 is a rear end and a side view of the needle-mount. Fig. 8 is a broken side elevation of the adapter and needle-mount showing the dogs engaging grooves of the mount and Fig. 9 is a rear end elevation of the needle-mount.

In the drawing, 2 represents the barrel of the syringe, having its head end fitted with and partially closed by a ferrule 3, the latter being provided with finger loops 3', which are rigid to its opposite sides. 4 represents the plunger, by means of which the barrel may be filled and emptied, the said plunger being mounted upon a stem 4', which plays in a concentric opening in the ferrule, and its outer end being fitted with the usual thumb loop 4^a. The opposite end of the barrel is usually tapered, as at 2^a, and telescopes an adapter 5, the latter having a socket 5', for snugly receiving the barrel, and to which the barrel may be rigidly secured by solder or cement. The free end of the adapter comprises a tapered portion 5^a, which is formed with a relatively large bore 5^b, that communicates with the interior of the barrel 2. At the base of the conical prolate 5^a, the adapter is formed with a cylindrical portion 5^c having a circumferential groove 5^d, and adjacent the said cylindrical portion the body 5 is formed with an annular flange 5^e, the latter having its opposite sides correspondingly grooved or depressed longitudinally for providing similar cam portions 5^f. 6 represents an ordinary hollow hypodermic needle, which is supported by a mount or holder 7, the latter being bored out axially, as at 7' to receive the needle. Beyond the needle bore, the mount 7 is formed with a tapered socket 7^a, the taper thereof, preferably corresponding exactly to the taper of the "slip" 5^a, and the inner end of the mount 7 is shown formed with a flange 7^b, the said flange being preferably cut away or flattened at the opposite sides of the mount, as shown in the end view of Fig. 7. 8 represents an annular sleeve-coupling, or collar which is bored out to operatively fit the cylindrical portion 5^c, the said coupling being formed at one end with

a transverse recess or socket 8', which is adapted to receive the flange-end 7^b of the needle-mount, as shown in Fig. 2. By this construction and arrangement, the mount 7 and the coupling 8 may be rotated on the adapter as one part, and by reason of the interlocking of the said parts neither may be rotated independently of the other. The coupling 8 is held from accidental detachment from the part 5^c, and yet is allowed free rotary movement thereon, by means of a pin 8^b, which plays in the groove 5^d. The coupling 8 is formed with oppositely facing, longitudinal grooves 8^c, in which are disposed similar dogs or grippers 9, as best seen in Figs. 1 and 6, the said dogs being pivotally held in place by pins 9'. The opposite ends of the dogs 9 project beyond the ends of the coupling 8, the ends 9^a of the dogs being normally in engagement with the flange 5^c, and adapted when the mount 7 is being applied to or removed from the adapter, to lie loosely in the cam-grooves 5^f. The other ends of the dogs are inclined towards each other, and comprise hooks or teeth 9^b, which are arranged to engage the opposite sides of the body of the needle-mount, as shown in Fig. 1. To apply the needle-mount to the adapter 5 and the coupling 8, the latter is preferably first rotated for positioning the dogs 9 in the cam-grooves 5^f. This allows their hook-ends 9^b to be spread apart sufficiently to permit the mount 7 to be slipped over the cone 5^a, and its flange-end to be entered into the socket 8', as shown in Fig. 2. The rigid or positive fastening of the needle-mount 7 may then be effected by the partial rotation of the mount and the coupling 8, in either direction, for shifting ends 9^a of the dogs out of the cam-grooves 5^f, as shown in Fig. 1. This partial rotation of the coupling 8 effects the spreading of the ends 9^a of the dogs, and correspondingly moves the hooks 9^b into gripping engagement with the needle-mount 7 (see Fig. 1).

In all hypodermic syringes, it is highly important that the needles and their mounts, as 7, be securely fastened to the syringe proper, in order that there may be no possibility of the needle becoming accidentally detached while the syringe is being used. It is equally important that the several parts be so constructed and arranged that when they are assembled (see Figs. 1 and 2), all danger of the liquid or other contents of the syringe escaping at the joints is obviated.

Obviously, some changes may be made in the construction and arrangement of the parts of the adapter, for example (see Figs. 8 and 9); the mount 7 may be formed with a continuous flange 7^c, which may be applied to a circular socket 8^c, of the sleeve 8, and the hook-ends 9^b of the dogs may be positively seated in depressions or grooves 7^d of the

mount, without departing from the invention as claimed.

Having thus described my invention, what I claim, is—

1. In a syringe, the combination with the barrel and a hollow needle and a needle mount having a conical socket facing the barrel, of an adapter for connecting the needle-mount with the barrel comprising a hollow body having a conical tip adapted to enter the socket of the mount, a collar swivelled to said body adjacent said tip, means for interlocking the needle-mount with said collar, and means carried by said collar adapted to grip the needle-mount when said mount and said collar are rotated as one part.

2. An adapter for syringes comprising a hollow body adapted to telescopically receive the barrel of the syringe, said body having a tapered tip, a needle-mount comprising a hollow body having a tapered socket at one end adapted to receive said tip, a collar swivelled to the adapter beyond said tip, said collar having a socket adapted to receive one end of the needle-mount, and means carried by the collar adapted to grip the needle-mount for preventing accidental detachment thereof.

3. In a hypodermic syringe, the combination with the barrel and a needle-mount having an enlarged end formed with a conical socket, of an adapter for detachably connecting the needle-mount with the barrel, comprising a hollow body having at one end a conical tip adapted to telescope said mount and having a flange formed with oppositely facing cam grooves, means swivelled to the said body, adapted to interlock with the needle-mount for rotation as one part, and means carried by said swivel member and engaging said cam-grooves adapted to grip and hold the needle-mount in the operative position.

4. In a hypodermic syringe, the combination with the barrel and the plunger, of an adapter having a socket to receive the barrel and having a conical extension aligning axially with the barrel, said adapter being formed medially with circumferential cam-portions, a sleeve-coupling rotatable on the adapter and having a recess facing said extension, a plurality of dogs pivotally supported by said coupling and engaging said cam-portions, and a needle-mount having a tapered socket to receive said extension and having a flattened end adapted to enter the recess of the coupling, said mount and said coupling adapted to be rotated for causing said dogs to grip the opposite sides of said mount.

5. An adapter for hypodermic syringes comprising a hollow body having a socket at one end to receive the barrel of the syringe, the opposite end comprising a tapered

prolong, said adapter being formed with a circumferential flange having oppositely facing cam-sockets, a sleeve-coupling swivelled to the adapter between the prolong and
 5 the flange, having oppositely facing longitudinal grooves and having a transverse socket in the end facing the prolong, a needle-mount adapted to "slip-on" said prolong and to enter said transverse socket, and
 10 a pair of dogs pivoted in the longitudinal grooves of the coupling, corresponding ends of the dogs adapted to engage said cam-sockets, the opposite ends of the dogs being inclined towards and adapted to grip the
 15 body of the needle-mount when the coupling is rotated.

6. In a hypodermic syringe, the combination with the barrel and a needle-mount, said mount being bored out at one end to receive a hollow needle, the opposite end being formed with a tapered socket and said
 20 end being flattened at its opposite sides, of an adapter interposed between the needle-mount and said barrel having a socket at one end to receive the barrel, the other end comprising a tapered hollow tip adapted to telescope the flattened end of said mount, said adapter being formed with circumferential cam-portions, a sleeve swivelled to the
 25 adapter between the prolate and said flange having a socket adapted to receive the flattened end of the needle-mount, and grippers carried by said sleeve adapted to be moved into and out of engagement with the needle-mount by the rotation of the sleeve in opposite directions.

7. In a hypodermic syringe, the combination with a barrel and a plunger, of an adapter telescopically receiving one end of
 40 the barrel, the remote end of the adapter comprising a conical tip, the medial portion of the adapter being formed with a circum-

ferential flange having oppositely facing cam-grooves, a collar rotatably mounted on the adapter adjacent said flange, said collar
 45 having oppositely facing longitudinal grooves and having a transverse socket in one end, rockable grippers pivoted in the grooves and extending beyond the ends of said collar, said grippers adapted to be
 50 rocked by said cam-grooves, when the collar is rotated, and a needle-mount telescoping said conical tip, one end of said mount being bored out to receive a needle, the opposite end adapted to engage said
 55 transverse socket for rotating said collar and for rocking said grippers toward and away from the mount.

8. In a hypodermic syringe, the combination with the barrel, of a hollow adapter
 60 having a socket at one end to receive said barrel, the opposite end comprising a tapered extension, said adapter being formed medially with an annular flange, said flange having oppositely facing cam-
 65 sockets, an annular coupling rotatably mounted on the adapter adjacent the flange and having transverse groove facing the said extension, a needle-mount having one end formed with a tapered socket adapted
 70 to receive said prolate, the other end adapted to support a hollow needle, said mount adapted to interlock with the transverse groove of the coupling for rotation as one part, and a plurality of dogs pivoted to the
 75 opposite sides of said coupling, the ends of said dogs overlapping said flange and engaging said cam-sockets, the opposite ends of said dogs overlapping said mount adapted when the mount and coupling are rotated to
 80 be moved away from said cam-sockets for gripping the opposite sides of the mount.

In testimony whereof I affix my signature.

GEORGE E. HAINES.