

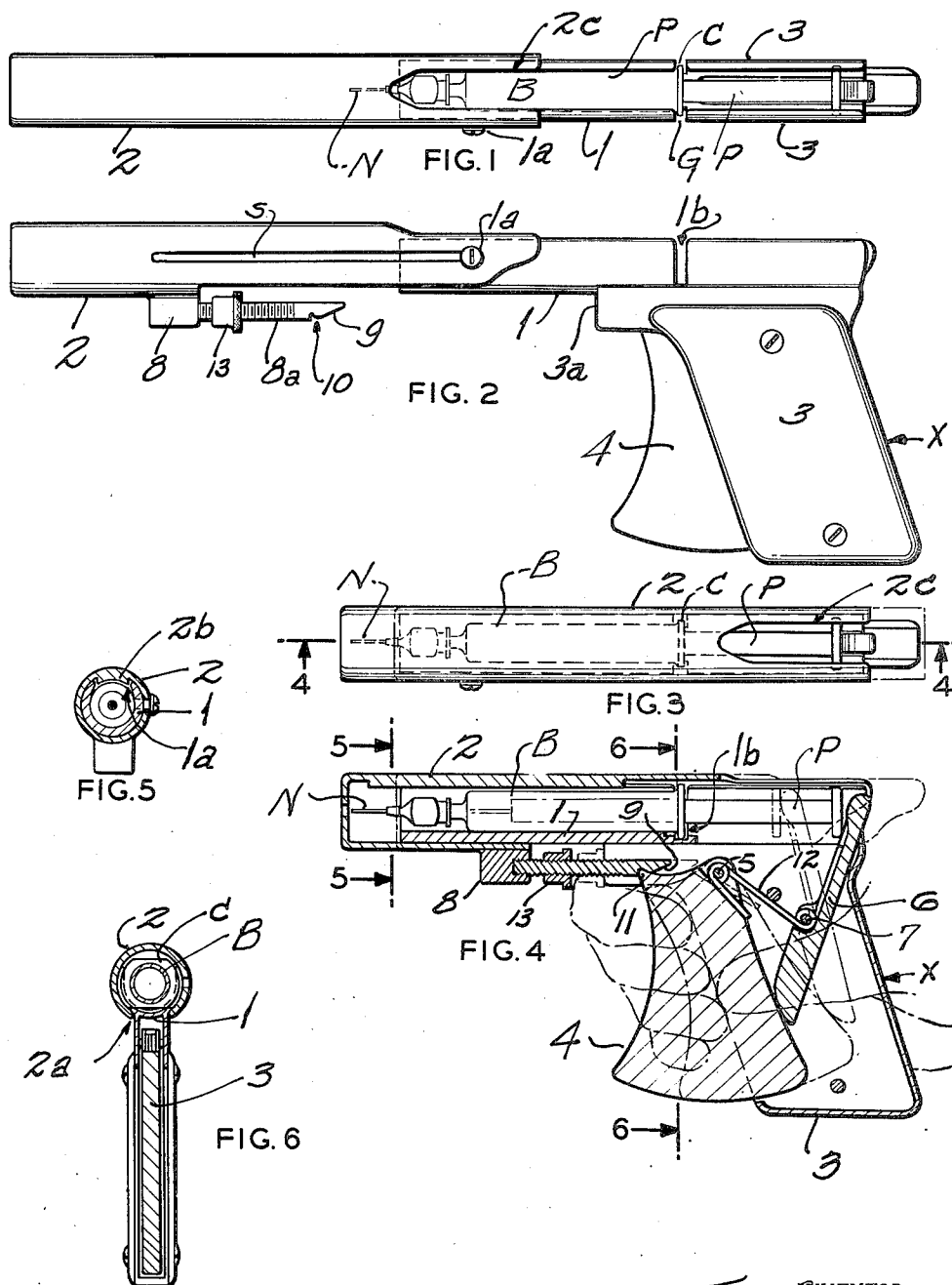
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MEDICINE INJECTOR

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MEDICINE INJECTOR

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The invention relates to an instrument for injecting medicine subcutaneously, but not intravenously, and is adapted for use with a common form of cylinder and plunger syringe which discharges through a hollow needle which is inserted into the flesh of the user.

One object of the invention is to avoid, to a substantial degree, the psychological effect on the patient of seeing a needle being inserted into his flesh and the tension likely to result from such viewing, which has a physiological effect in making the insertion and injection more difficult. This object is attained by concealing the syringe and needle. The attainment of this object is even more effective when the medicine is being self-injected and the insertion of the needle and the injection of the medicine is determined by the muscular action of the patient.

Another object is to insert the needle and inject the medicine solely by the muscular action of the operator, thereby avoiding the use of springs for either of these purposes. This makes it possible for the user to determine readily the pressure applied by the instrument.

Another object is to insert the needle and discharge the medicine by a continuous, simple, muscular action and to avoid the shifting of the operator's grip on the instrument during the operation or the necessity of different adjustments of the fingers during the operation in order to manipulate the instrument. The attainment of this object also avoids the likelihood of moving the instrument, and particularly the needle, sideways during the operation.

Another object is to facilitate ready loading the syringe in the instrument and removing the syringe from the instrument and making it easy to load the syringe into the instrument without contacting the sterile needle with an instrument surface.

These and other detailed objects or advantages of the structure, as will appear below, are attained by the structure illustrated in the accompanying drawings, in which:

Figure 1 is a top view of the instrument with telescoping parts in fully extended position adapting the instrument for insertion or removal of a syringe.

Figure 2 is a side view of the instrument as shown in Figure 1.

Figure 3 is a top view of the instrument with the telescoping parts in initial retracted position and adapted for an injecting operation. The parts are shown in dot and dash lines in fully retracted position.

Figure 4 is a vertical longitudinal section on the line 4—4 of Figure 3.

Figure 5 is a transverse vertical section on the line 5—5 of Figure 4.

Figure 6 is a transverse vertical section on the line 6—6 of Figure 4.

The instrument includes a hollow elongated body 1, with a top opening P, and a sleeve 2 partially enclosing and slidable on the body. These parts may be of cylindrical or other suitable cross section. A pin 1a fixed on the body is slidable in a slot S on the sleeve, the ends

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of the slot limiting the relative movement of these parts. A handle 3 is rigid with body 1 and a trigger 4 is received within the handle and is pivoted thereto at 5. A lever 6 in the handle is pivoted thereto at 7 and its lower end 5 is positively actuated by the retraction of trigger 4 to move the lever to the dot-dash line position shown in Figure 4. A torsion spring 12 yieldingly urges the trigger and lever to the full line position shown in Figure 4.

Depending from sleeve 2 is a rigid boss 8 carrying an elongated threaded projection 8a parallel with but spaced below the sleeve and terminating at its right hand end in a cam 9 leading to a notch 10. The upper forward end of trigger 4 terminates in a lip 11 disposed to ride over cam 9 into notch 10 as sleeve 2 is moved manually from the position shown in Figures 1 and 2 to the position shown in Figures 3 and 4. At this point in the movement of the sleeve to the right, elements 10 and 11 form a stop positively interrupting the telescoping movement of the body and sleeve.

Manual retraction of the trigger releases the stop and permits further telescoping of the body and sleeve until a friction nut 13 on projection 8a contacts an opposing surface 3a on the handle, the lower portion of sleeve 2 being slotted at 2a to receive handle 3 when the sleeve is retracted and the handle being apertured to receive projection 8a.

The inside diameter of body 1 slightly exceeds the outside diameter of an ordinary glass plunger-type syringe barrel B and when body 1 and sleeve 2 are in extended position, as shown in Figures 1 and 2, the syringe may be dropped through opening P into the pocket formed by the hollow body beneath opening P, the syringe collar C being received in a transverse groove G provided therefor in body 1 and thus holding the syringe in a fixed position longitudinally of the barrel. The rear upper portion of sleeve 2 is slotted at 2c to receive the forward end of the syringe, which may be inserted in the sleeve without contacting its needle with any part of the instrument. After the syringe is inserted, sleeve 2 is moved to the right until lip 11 rides over cam 9 into notch 10. In this position, as shown in Figures 3 and 4, the syringe, including its needle, is fully enclosed.

With the lower portion of the barrel grooved as shown, the syringe may be fully received irrespective of the angular position of its oblong collar. If it is desired, because of gradation marking or otherwise, to have the syringe disposed in a definite angular position, as with its collar extending horizontally as shown in Figure 6, the lowermost portion of groove 1b may be omitted, thus necessitating the turning of the syringe to the desired angular position before the sleeve may be retracted.

There are no spring connections between barrel 1 and sleeve 2 or between any part of the instrument and the syringe.

The user, grasping the instrument handle 3, places the left hand end of sleeve 2 against the flesh, applying as much pressure at X through the palm of the hand as may be deemed necessary. While this pressure is maintained, the fingers are contracted about handle 3 and trigger 4, preferably steadily and continuously. This first moves lip 11 out of notch 10 and barrel 1 and syringe B move to the left as a unit, inserting the needle N into the flesh solely by the pressure exerted by the user at X, and to the extent determined by the spacing of nut 13 from stop 3a. During this movement the end of the sleeve is shifted from the needle enclosing position shown in full lines in Figures 3 and 4 to the retracted position shown in dot-dash lines, so that the needle projects beyond the sleeve and into the flesh but the forward end of the sleeve is still in contact with the flesh and the needle is not observable. Continued contraction of the user's

fingers then moves the upper arm of lever 6 forwardly so that it contacts the rear end of the syringe plunger P and moves it to the left and forces the contents of the syringe through the needle into the flesh.

Upon completion of the injection, whether it consists in a discharge of all of the contents of the syringe or only a part thereof, the instrument is moved bodily to the right. This withdraws the syringe and needle from the flesh and, for the first time during the operation, the needle is apparent to the observer.

While the operator's hand still grips the instrument as shown in Figure 4, the fingers of the other hand may take hold of the sleeve and move it to its extreme projected position, as shown in Figures 1 and 2. The instrument may be inverted over a table or other surface and the syringe will drop out by gravity. The body and sleeve may then be telescoped for positioning in a case or other receptacle.

At no time during the operation described is it necessary for the user to shift his hand or fingers from one position to another or to exercise different muscles during any portion of the injection operation between the time the instrument is first applied to the flesh and the time when the needle is advanced and prior to the removal of the instrument.

The instrument is simple and sanitary and effectively attains the objectives set forth in the introductory portion of the specification. The details may be varied without departing from the spirit of the invention and the exclusive use of those modifications coming within the scope of the claims is contemplated.

What is claimed is:

1. In a device of the class described, a body part arranged to mount a plunger-type syringe and to limit its movement in relation to the body part, a flesh-contacting part movable on said body part from a projected position to a retracted position, a stop releasably holding said flesh-contacting part in the latter-mentioned position on the body part, and a member mounted on the body part for continuous movement to successively release said stop and to advance the syringe plunger.

2. In a device of the class described, a body part provided with an elongated pocket having an opening adapted to receive a plunger-type syringe and provided with elements adapted to limit movement of the syringe tube in the pocket, a sleeve part movable on the body part to an advanced position, in which it exposes said pocket opening, and to an intermediate retracted position, in which it covers the forward end of said pocket opening and an area outwardly beyond the same, and to a fully retracted position in which its forward end is close to the forward end of said pocket, stop means releasably engaging the sleeve-like part to interrupt its movement from said advanced position at said intermediate retracted position, and a member on the body part and movable manually and continuously from a non-functioning position into position to release said stop and thereafter to advance the syringe plunger.

3. In a device for injecting medicine from a tubular syringe having a needle projecting from one end and a plunger projecting from the other end, a body having an elongated chamber adapted to receive the syringe tube with the needle extending beyond one end of the chamber and having an abutment facing away from said chamber end, a flesh contacting part movable from a position,

in which it projects a substantial distance beyond said chamber end, to an intermediate retracted position, in which it substantially covers said chamber and a restricted area beyond a said chamber end, stop means releasably holding said part against retractive movement past said intermediate retracted position, a member movably mounted on the body, said member including a stop-releasing element and a finger-engageable portion for moving the member on the body, and a lever pivoted on said body and having a portion in axial alignment with said chamber and near the other end of the chamber and having a portion in position to be engaged by said member to swing the lever on its pivot to move its first-mentioned portion towards said abutment.

4. In a device of the class described, a tubular body having an elongated pocket with an elongated slot at one side and adapted to receive in said pocket a plunger-type syringe when applied in a direction transversely of its length and limit its axial movement in said pocket, a sleeve slidable axially over the forward portion of said body and over a syringe in said pocket between a projected position and successive retracted positions, stop means on said body and sleeve limiting the retracting movement of the sleeve, a member on the body operable manually to release said stop means by initial movement of said member from its normal position, and a part actuated by continued movement of said member and movable towards said body forward portion to advance a syringe plunger relative to the body.

5. In a device of the class described, an elongated body forming a hollow tube open at one side, a pistol-like handle depending therefrom, a tubular sleeve slidably over the forward end of the body and having a downwardly facing track forming a cam with an upwardly extending notch at its inner end, a trigger-like member pivoted on said handle with an upwardly extending lip, a spring urging said trigger-like member to hold said lip to said track and notch, a lever pivoted intermediate its ends on said handle with one arm engageable by said trigger-like member and the other arm including a portion in axial alignment with the rear end of said pocket.

6. A device according to claim 5 in which the spring urging the trigger-like member to a track engaging position also urges the lever into engagement with the trigger-like member.

7. In a device of the class described, a body part arranged to mount a plunger-type syringe and to limit the movement in relation to the body part, a flesh-contacting part movable on said body part from a projected position to an initial retracted position, releasable stop means holding said flesh-contacting part in said retracted position, a trigger-like member mounted on the body part for continuous movement on the body to successively release said stop means and to advance the syringe plunger from the flesh-contacting part, stop elements on the body part and flesh-contacting part respectively, limiting the plunger-advancing movement of the trigger-like member, at least one of said stop elements being readily adjustable relative to the part on which it is mounted to vary the plunger-advancing movement of the trigger-like member.

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