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HYPODERMIC SYRINGE INJECTOR

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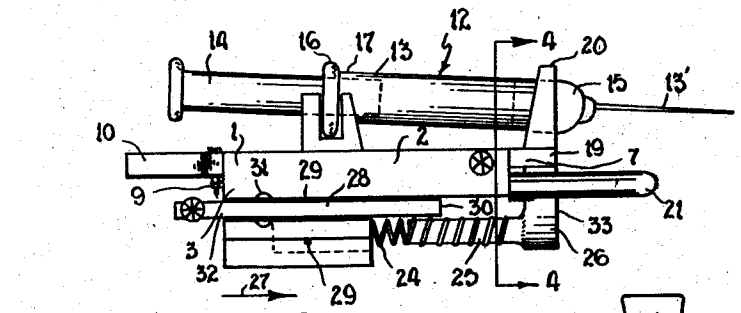


Fig 1

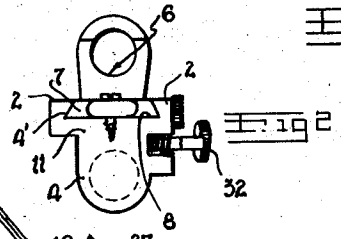


Fig 2

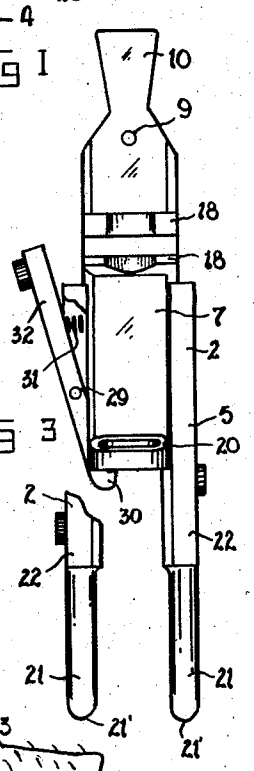


Fig 3

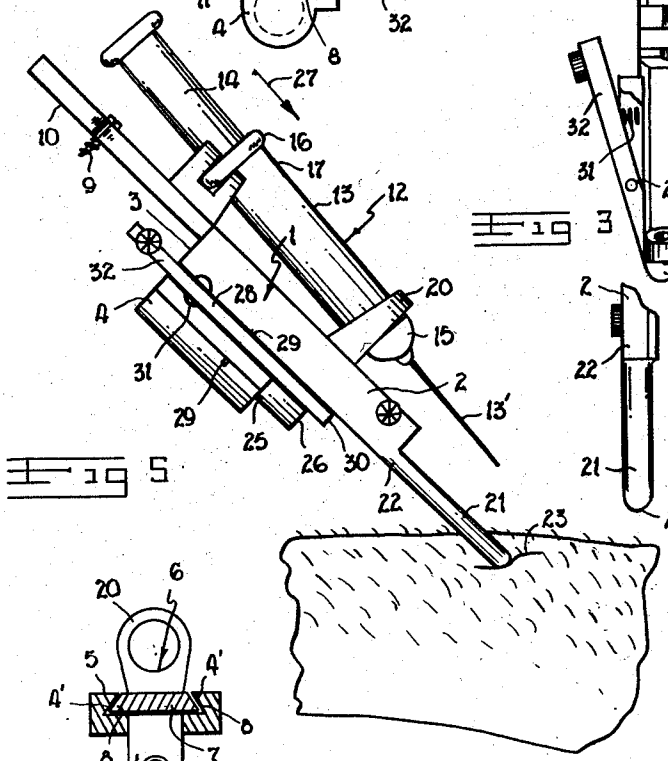


Fig 5

Fig 4

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HYPODERMIC SYRINGE INJECTOR

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1 Claim. (Cl. 128—218)

My invention relates to new and useful improvements in syringe injectors, the principal object and essence of my invention being to provide a device of the character herewithin described particularly adapted for use by invalids who are required to make hypodermic injections themselves from time to time, the principal object and essence of my invention being to provide a means carrying the syringe and needle which may be spaced the requisite distance from the skin, and which when released automatically injects the needle the required amount ready for the injection to proceed.

Another object of my invention is to provide a device of the character herewithin described in which the syringe can readily be removed and replaced as desired.

Yet another object of my invention is to provide a device of the character herewithin described which is simple in construction, economical in manufacture, and otherwise well suited to the purpose for which it is designed.

With the foregoing objects in view, and such other objects and advantages as will become apparent to those skilled in the art to which this invention relates as this specification proceeds, my invention consists essentially in the arrangement and construction of parts all as hereinafter more particularly described, reference being had to the accompanying drawings in which:

Figure 1 is a side elevation of my device showing a syringe in situ and showing the carrier in the forward position.

Figure 2 is a rear end view of Figure 1.

Figure 3 is a top plan view of Figure 1 with the syringe removed and showing the carrier in the loaded position.

Figure 4 is a section substantially along the lines 4—4 of Figure 1, but with the syringe removed for clarity.

Figure 5 is a side elevation of my device showing the syringe in position and the carrier loaded resting upon the skin ready for firing.

In the drawings like characters of reference indicate corresponding parts in the different figures.

Many illnesses require self-medication at regular intervals, said medication taking the form of injections by means of a hypodermic syringe. An example of this is diabetes, which requires the patient to make regular hypodermic injections of the drug "Insulin." It is well known that many people are adverse to plunging the needle of a hypodermic into their own skins, and this is particularly so when the skin and veins become hard and scarred after repeated injections.

By means of this device, the hypodermic syringe can be positioned with the needle a predetermined distance from the skin whereupon, upon release of the trigger, the syringe and needle is shot forward at sufficiently velocity to enable the needle to penetrate the skin and flesh the required amount with the minimum of pain and difficulty.

Proceeding therefore to describe my invention in detail, it will be seen upon reference to the accompanying drawings that I have provided a body portion **1** consisting of a pair of sides **2** joined towards the rear ends **3** thereof by means of a portion **4**. The sides **2** are provided with

guideways **4'** adjacent the upper edges **5** thereof, said guideways preferably being in the form of mortise slots, as clearly shown in Figure 4.

Adapted to reciprocate within these guideways is a hypodermic syringe carrier collectively designated **6**, said carrier comprising a substantially rectangular base **7**, the edges **8** of which are shaped to conform with the mortise slots or guideways **4'**, so that the carrier can reciprocate freely within the guideways. The amount of forward movement of the carrier is restricted by means of a stop **9** adjacent the rear end **10** thereof, said stop extending downwardly and adapted to engage the portion **11** of the main body portion **1**.

Extending upwardly from the base **7** of the carrier is means to detachably support a hypodermic syringe collectively designated **12**. This syringe comprises a barrel **13** having a piston or plunger **14** reciprocal therein and a hypodermic needle **13'** detachably secured to the forward end **15** of the barrel. The barrel conventionally includes a shoulder **16** adjacent the rear end **17** thereof and I have provided grooved or recessed lugs **18** extending upwardly from the base adapted to receive this shoulder, as clearly shown in the accompanying drawings.

Adjacent the front end **19** of the base **7** I provide a ring bearing **20** adapted to receive the forward end **15** of the hypodermic syringe barrel, so that when the front end of the barrel is passed through the ring **20** and the shoulder **16** is allowed to seat within the lugs **18**, the syringe barrel is held firmly upon the carrier.

A pair of spacers **21** extend forwardly from the front end **22** of the body portion in spaced and parallel relationship and are adapted to rest upon the skin **23** of the user, thus spacing the hypodermic syringe a predetermined distance therefrom.

Means are provided to drive the carrier and syringe forwardly under spring pressure and to maintain the syringe and carrier in the rearward position ready for firing. The aforementioned portion **4** of the body portion is apertured to receive one end of a coil spring **24**, the forward end of the spring surrounding a rod **25**, which extends rearwardly from a downward projection **26** of the base **7** of the carrier, said spring being adapted normally to drive the carrier forwardly in the direction of arrow **27**.

A trigger **28** is provided within the body portion consisting of a lever pivoted intermediate its ends as at **29** and having a detent **30** upon the forward end thereof. This trigger is normally adapted to bias the detent **30** inwardly inasmuch as a small spring **31** reacts between the rear portion **32** of the trigger and the body **1** of the device, as clearly shown in Figure 3.

The detent **30** is adapted to engage around the forward end of the portion **26** depending from the base **7** of the carrier, as indicated in Figure 3.

In operation, the syringe is loaded with the necessary medication whereupon it is placed upon the carrier as hereinbefore described. The carrier and syringe are then drawn rearwardly in a direction opposite to arrow **27** and against the pessure of spring **24** until the forward edge **33** of the portion **26** is engaged by the detent **30**. The device is now loaded or cocked and ready for use.

The device is then held at an angle to the skin of the user with the extremities **21'** of the spacers being pressed lightly against the skin **23**. The spacing of these spacers tends to stretch the skin tautly as slight pressure is applied, thus placing the skin under the best conditions for receiving the needle. The end **32** of the trigger is now depressed, thus allowing spring **24** to drive the carrier and hypodermic syringe downwardly at the required velocity to permit the hypodermic needle **13** to pierce the skin and flesh the requisite amount, the depth of penetration

being controlled by the aforementioned stop 9 upon the carrier.

The plunger 14 may now be depressed, thus discharging the medicament into the flesh of the user, whereupon the entire device may be withdrawn and the syringe removed ready for cleaning and refilling.

Since various modifications can be made in my invention as hereinabove described, and many apparently widely different embodiments of same made within the spirit and scope of the claim without departing from such spirit and scope, it is intended that all matter contained in the accompanying specification shall be interpreted as illustrative only and not in a limiting sense.

What I claim as my invention is:

In a device for injecting the needle of a hypodermic syringe into the skin, in which said syringe comprises a barrel, a surrounding flange on said barrel, a plunger reciprocal in said barrel, and an hypodermic needle mounted upon the lower end of said barrel; said device including a body portion, means extending from one end of said body portion adapted to register against the skin of the user, thereby maintaining said body portion in a predetermined spaced relationship therefrom, a syringe carrier reciprocal within said body portion, said body portion including a pair of spaced and parallel guideways, said syringe carrier adapted to move lengthwise in said guideways, means adapted to move said carrier along said body portion, said last-mentioned means including a spring-carrying rod extending rearwardly from front end of said base and spaced below same, a coil spring surrounding said rod and re-acting between said front end and said body portion adapted to normally urge said carrier forwardly with relation to said body portion, trigger means to set and release said carrier, said syringe carrier including a base and means on said base adapted to detachably retain said syringe barrel, said last-mentioned means comprising a pair of lugs extending upwardly from said body portion adapted to embrace said syringe barrel, recesses formed in said lugs adapted to receive said surrounding flange, and a ring bearing also extending upwardly from said body portion adapted to surround said syringe barrel.

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