

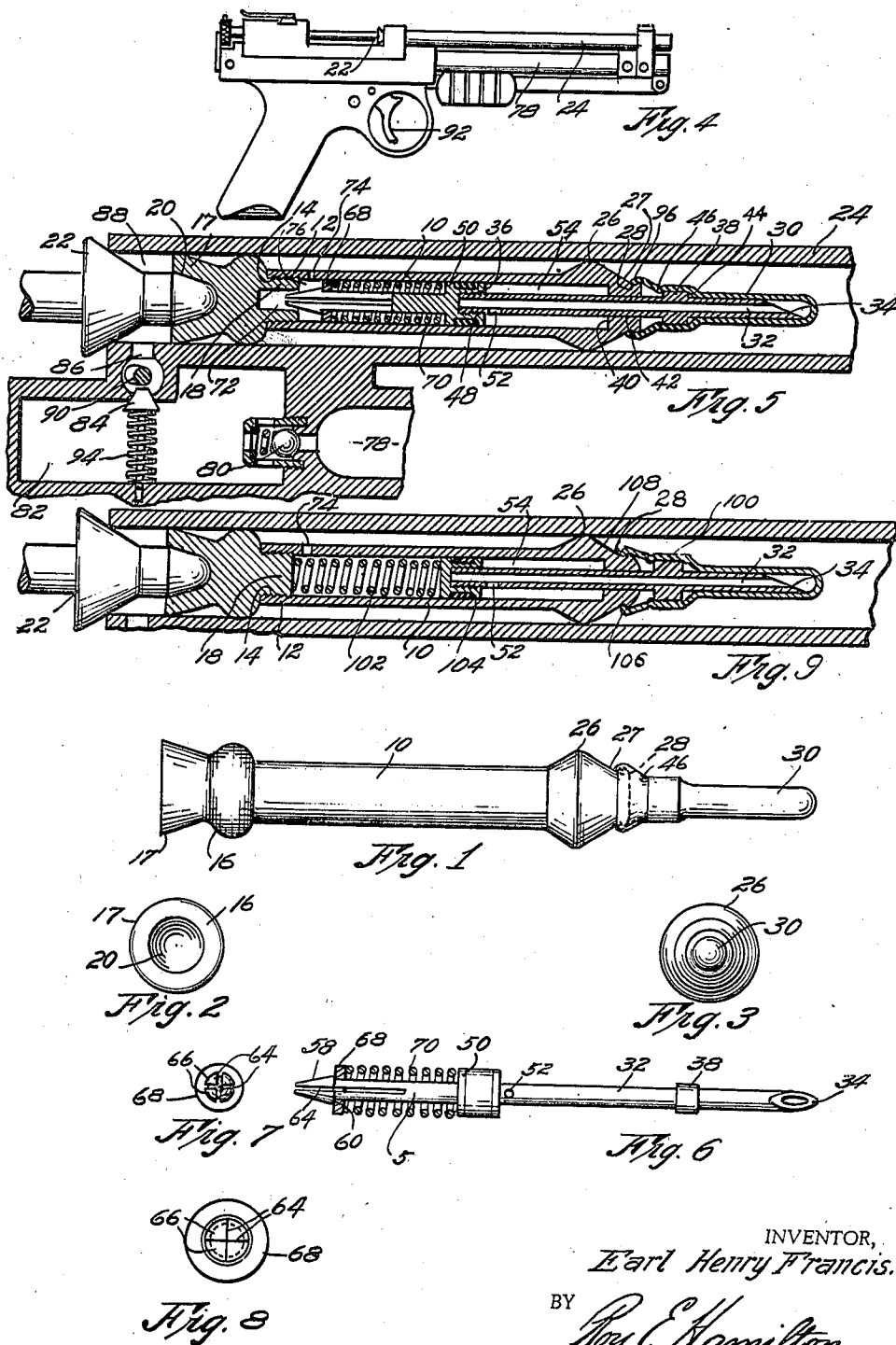
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HYPODERMIC PROJECTILE

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HYPODERMIC PROJECTILE

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5 Claims. (Cl. 102—92)

This invention relates to improvements in hypodermic projectile and has particular reference to a projectile suitable for carrying a hypodermic fluid for injection into a distant object.

The principal object of the present invention is the provision of a hypodermic projectile adapted to be projected from the barrel of a gun and to forcibly discharge a hypodermic fluid into a body contacted by the projected projectile.

A further object of the invention is the provision of a hypodermic projectile comprising a case in which is slidably mounted a hypodermic needle which partially extends from the outer end thereof and means for forcing a hypodermic fluid through said hypodermic needle as said projectile contacts a body member in the path of its travel.

Other objects of the invention are simplicity and economy of construction, efficiency of operation and adaptability for use in any of the various types of power projectiles.

With these objects, in view, reference will now be had to the drawing wherein:

Figure 1 is an elevational view of a hypodermic projectile embodying this invention.

Fig. 2 is a rear end view of said projectile.

Fig. 3 is a front end view of the projectile.

Fig. 4 is a side elevation of an air gun suitable for projecting the projectile.

Fig. 5 is a sectional view of a portion of the air gun with the projectile, positioned therein, said projectile being shown in longitudinal sectional form.

Fig. 6 is an elevational view of the hypodermic needle and parts fixed thereto, partly in section.

Fig. 7 is an end view of the parts shown in Fig. 6.

Fig. 8 is an enlarged view, as shown in Fig. 7, with the chuck jaws compressed to release the power spring.

Fig. 9 is a modified form of the hypodermic projectile shown in longitudinal sectional view and positioned in the gun barrel.

Throughout the several views like reference characters refer to similar parts and the numeral 10 designates a projectile case or shell preferably made of a relatively soft metal such as lead alloys, etc., and having an open end 12 internally threaded at 14 to receive a plug 16 having a threaded boss 18 which operatively engages threads 14.

The outer portion 17 of boss 18 is frusto-conical in shape and is recessed at 20 to receive the end of plunger 22 as clearly shown in Fig. 5. This frusto-conical portion flares outwardly and

is adapted to closely fit the side walls of the gun barrel 24 and due to the fact that this portion 17 is also made of a soft material it will conform to the shape of the barrel and if said gun barrel is rifled the rifling will engage said portion 17, thus causing the projectile to rotate so as to maintain a substantially constant longitudinal position during its course of travel.

The front end of case 10 is provided with an annular rib or enlargement 26 which also snugly fits the inner contour of the barrel as shown.

An annular recess 28 is formed adjacent the front end of case 10 to receive the open end of the needle cap 30 which is adapted to be forced therein to secure the cap in position against accidental displacement.

The hypodermic needle 32 is cut on a bias at its one end to form a sharp point 34 and is threaded at its opposite end at 36 and is provided with an annular band 38 intermediate its ends. This needle is slidably mounted in the end wall 40 of the case 10 through the opening 42.

The needle cap 30 is made of a relatively soft material such as lead, and is offset at 44 to engage the front wall of annular band 38 and is annularly depressed at 46 to engage the rear edge of band 38 thereby securing the needle against accidental movement relative to the case 10.

It will be noted that the point 34 of the needle is made of a hard material such as steel and will penetrate and pass through said needle cap when the projectile contacts a body during its flight.

The threaded end of needle 32 engages the threaded socket 48 of piston 50 and is provided adjacent said piston with a transverse opening 52 which communicates with chamber 54 disposed between piston 50 and end wall 40 in case 10 when the needle is in the normal position as shown in Fig. 5.

Piston 50 is provided with a rearwardly extending stem 56 terminating in a frusto-conical head 58 to form shoulders 60. This stem is diametrically slotted at 64 to form chuck jaws 66. A ring member 68 is adapted to be forced over the frusto-conical head 58 to engage the shoulder 60 and when so positioned will support the compression spring 70 against the rear wall of piston 50 as shown in Fig. 5. The reduced portion of head 58 normally rests in an annular recess 72 formed in boss 18 and is so related thereto that as the needle 32 is forced rearwardly into said recess due to the impact against a body member it will cause the chuck jaws to be forced together as shown in Fig. 8 so as to reduce the effective diameter of shoulders 60, thereby per-

mitting the ring 68 to slip thereover due to the action of compression spring 70, which will pass over the head 58.

The inclined wall 27 of rib 26 terminates in groove 28 so that as cap 30 is forced rearwardly the open end of the cap will be enlarged to freely move away from case 10 as the needle is moved outwardly relative to case 10.

When ring 68 is thus released the spring 70 will force the piston 50 forwardly thereby forcing the hypodermic fluid contained within chamber 54 through opening 52 and into needle 32 thence into the body which has been penetrated by the hypodermic needle. It should be kept in mind that the needle cap is made of a soft material, such as lead, and will be forced rearwardly from the end of the needle as the needle penetrates the end wall of the body member thereby insuring definite delivery of the hypodermic fluid to said body.

An opening 74 formed through the wall of case 10 communicates with the recess 76 formed in said case to the rear of the piston 50 thereby permitting free movement of the piston and without creating any objectionable vacuum.

A typical type of air gun suitable for projecting this particular type of projectile is shown in fragmentary detail in Fig. 5. The usual compression chamber 78 in which the air is compressed by any of the usual means delivers air through the check valve 80 to compression chamber 82 and a valve 84 controlling a passageway 86 leading to the chamber 88 formed between the plunger 22 and the rear end of portion 17 is operable by means of tumbler 90 which is operable in the usual manner, not shown, by trigger 92. When it is desired to fire the projectile the operator simply pulls back on trigger 92 to force valve 84 downwardly thereby permitting the flow of compressed air to the rear of boss 18 which will cause the projectile to be discharged from the gun barrel 24. The spring 94 normally holds valve 84 in the closed position.

The projectile, as shown, is on a larger scale than would normally be used in actual practice, however, in some instances it might be desirable to use projectiles of various sizes.

The chamber 54 and needle 32 are filled with any desirable liquid and then the cap 30 is positioned over the outer end of the needle crimped at 46 and at 96 to hermetically seal the chamber 54 and to preclude objectionable air pockets within the needle or chamber 54.

Referring now to the modified form, shown in Fig. 9, the needle cap 100 is made of sufficiently strong material to hold the needle against outward movement due to the force of compression spring 102 which is positioned between boss 18 and piston 104.

In this structure when the needle contacts a body in its flight the flared portion 106 of needle cap 100 will be forced rearwardly against the conical wall 108 of the end portion of case 10 thereby spreading the rearward end of the cap so that it will not engage the recess 28 formed in the outer extremity of the case thus permitting the needle to be forced outwardly by the action of spring 102 to discharge the hypodermic material through needle 32 and into said body member as described above.

It is quite apparent that the projectile above described is adapted to be projected from a barrel having a substantially cylindrical bore and that said projectile will maintain a substantially constant position relative to the direction of

travel due to its symmetrical form and that it will operate to discharge a fluid into a body pierced by the needle in its path of travel.

What I claim as new and desire to cover by Letters Patent is:

1. A hypodermic projectile comprising a case having an opening through its outer end wall; a hypodermic needle having a side opening slidably mounted in the end wall of said case and projecting outwardly therefrom; a piston fixed to the inner end of said needle and positioned in spaced relation to said end wall to form a fluid chamber therebetween; a spring; means securing said spring under compression in operative relation with said piston; and means operable when said needle is forced inwardly into said case to release said compression spring securing means whereby said spring expands to cause a relative movement of said piston and case to cause a fluid to flow from said chamber outwardly through said needle.

2. A hypodermic projectile comprising an elongated case having annular rings adjacent its opposite ends to contact the inner bore of a gun barrel and having an apertured end wall; a hypodermic needle having a transverse opening adjacent its inner end and being slidably mounted in said apertured end wall and projecting outwardly therefrom; a piston fixed to the inner end of said needle and positioned in spaced relation to said end wall to form a chamber for fluid therebetween; a resilient member secured under compression against said piston by means including a ring member carried by said piston operable as said needle is forced further into said case, to release said spring whereby it is permitted to expand to cause said piston to move relative to the case and force a fluid from said chamber outwardly through said needle.

3. A hypodermic projectile comprising a hollow case having an opening through its outer end wall; a hypodermic needle having a transverse opening slidably mounted through said opening in said end wall and projecting outwardly therefrom; a piston fixed to the inner end of said needle and positioned in spaced relation to the end wall of said case to form a fluid chamber about said needle; a spring secured under compression in operative relation with said piston within said hollow case; and means operable when said needle is forced inwardly into said case to release said compression spring securing means whereby said spring is permitted to expand to cause a relative movement of said piston in said case to cause fluid to flow from said chamber outwardly through said needle.

4. A hypodermic projectile comprising an elongated case having an apertured end wall; a hypodermic needle having a transverse opening adjacent its inner end and being slidably mounted in said end wall and extending outwardly therefrom; a piston fixed at the inner end of said needle and positioned in spaced relation to said end wall to form a chamber for fluid therebetween; a resilient member secured under compression against said piston by means including a ring member carried by said piston operable as said needle is forced further into said case, to release said spring whereby it is permitted to expand to cause said piston to move relative to the case and force a fluid from said chamber outwardly through said needle.

5. A hypodermic projectile comprising an elongated case having an apertured end wall; a hypodermic needle having a transverse opening ad-

jacent its inner end and being slidably mounted in said end wall and extending outwardly therefrom; a piston fixed at the inner end of said needle and positioned in spaced relation to said end wall to form a chamber for fluid therebetween; a resilient member secured under compression against said piston by means including a ring member carried by said piston operable as said needle is forced further into said case

to release said spring whereby it is permitted to expand to cause said piston to move relative to the case and force a fluid from said chamber outwardly through said needle; and a cap of relatively soft material secured to the forward end of said case to normally cover the outer end portion of said needle.

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