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2,995,373

HYPODERMIC PROJECTILE

Filed March 22, 1960

FIG. 3.

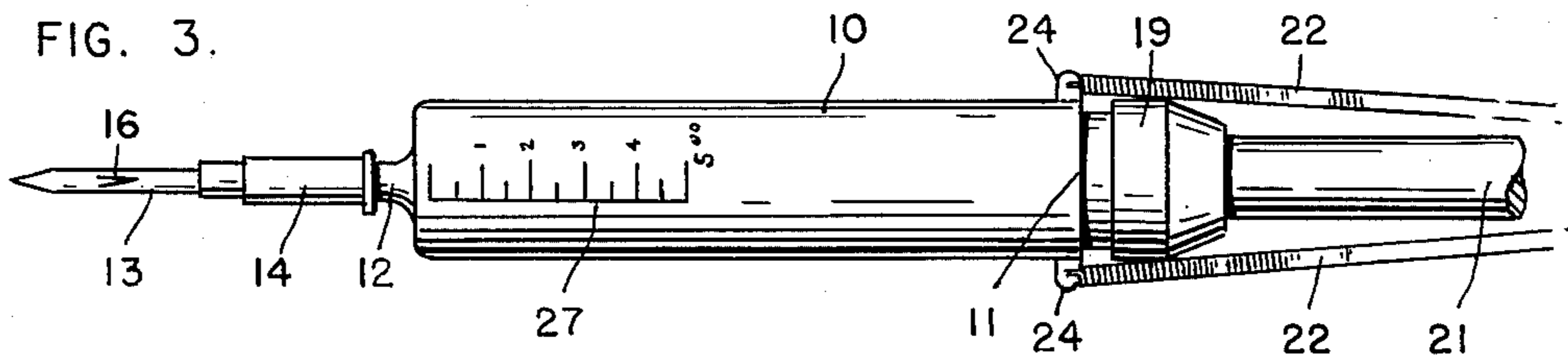


FIG. 4.

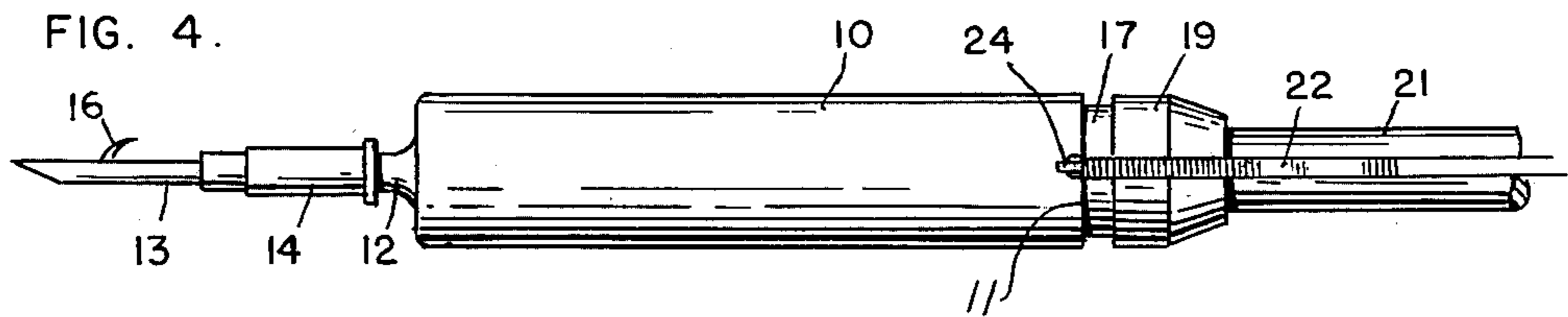


FIG. 5.

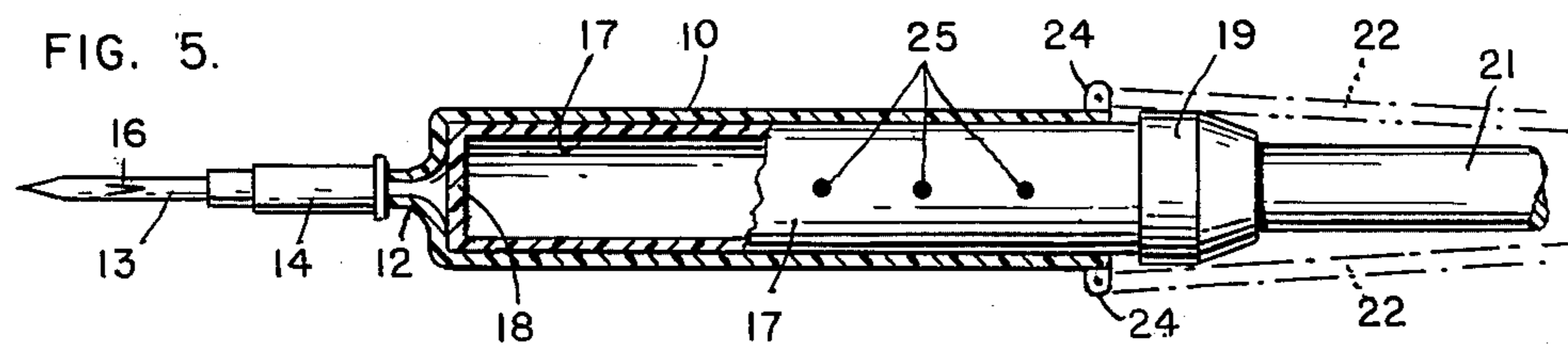


FIG. 6.

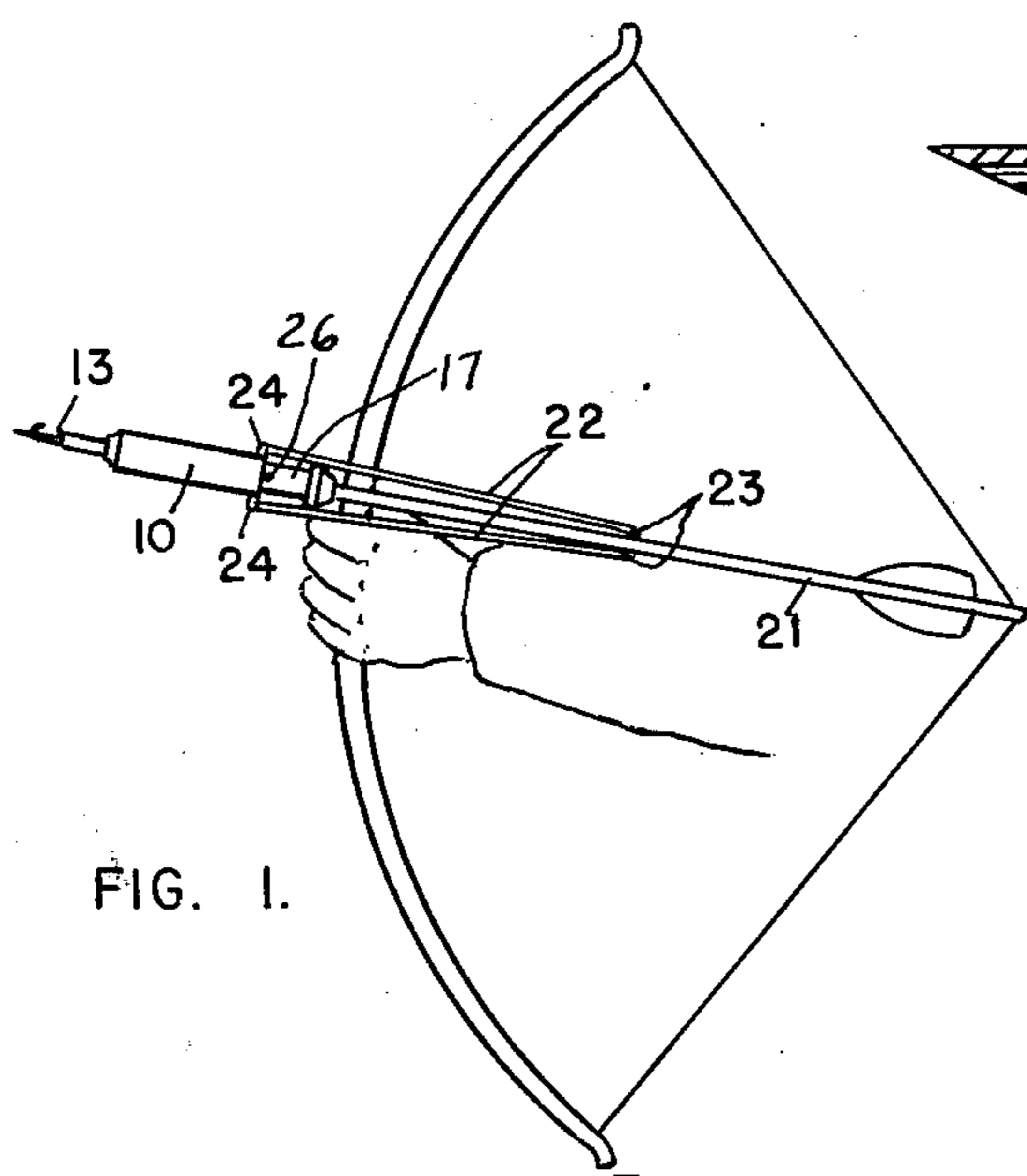
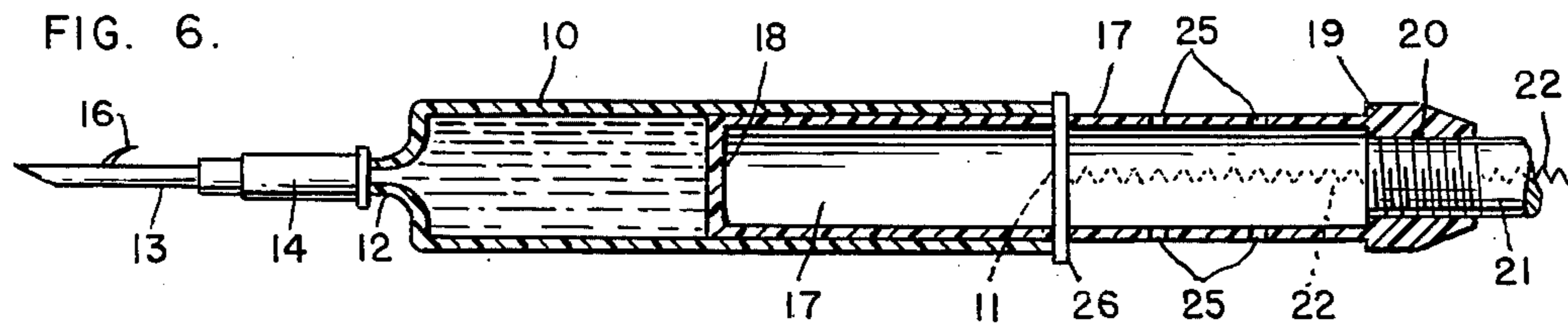


FIG. 1.

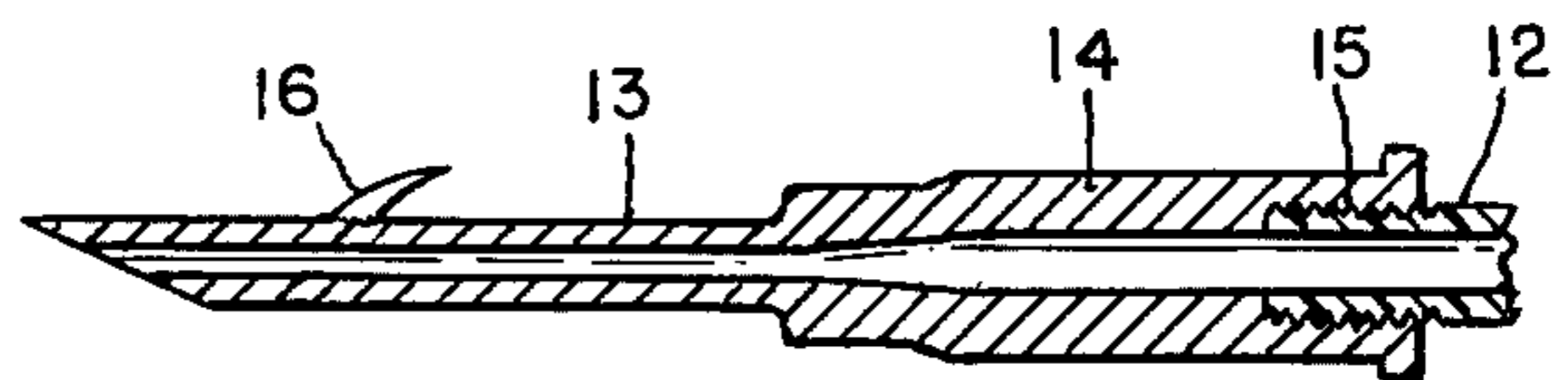


FIG. 7.

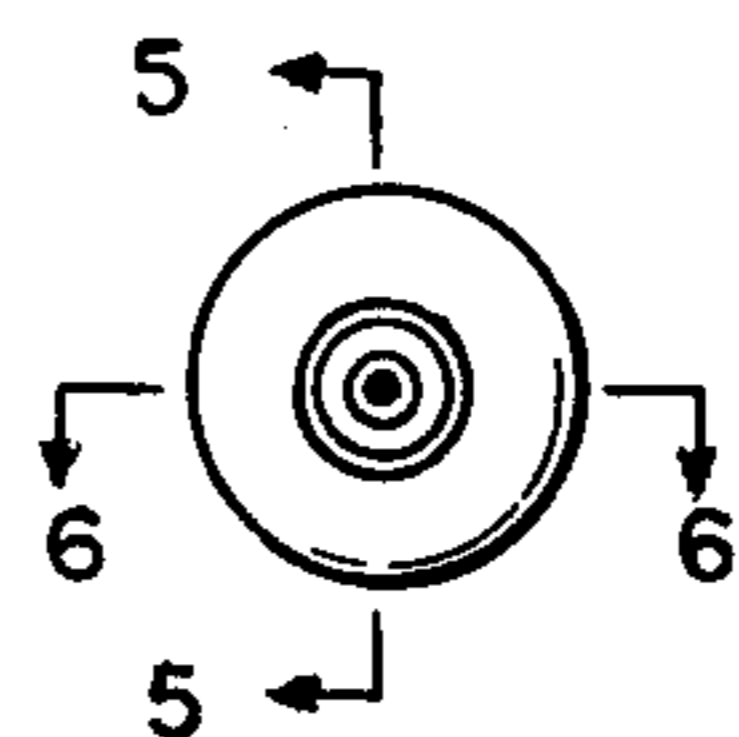


FIG. 2.

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HYPODERMIC PROJECTILE

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4 Claims. (Cl. 273—106.5)

This invention relates to a projectile including hypodermic syringe means.

An object of the invention is to provide a syringe projectile which may be in the nature of an arrow adapted to be shot from a suitable bow into contact with the body of an animal, to cause injection of the animal with serum, liquid anesthetic, liquid medicaments and the like.

Another object of the invention is to provide a projectile of the above mentioned character having novel and simplified means operable upon impact against the animal to cause the syringe means to automatically inject a predetermined desirable quantity of fluid into the animal tissue through the tubular needle of the syringe means.

A further object is to provide a syringe projectile which is adjustable to facilitate injecting the animal with the desired quantity of medicinal fluid, anesthetic or the like.

Still another object of the invention is to provide a projectile of the above mentioned character including a frangible element which fails upon impact against the animal to release resilient means which automatically operates the syringe plunger to inject the animal.

Other objects of the invention are to provide a device of the above mentioned character which is highly simplified in construction, sturdy and durable, inexpensive to manufacture, and reliable and efficient in operation.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

FIGURE 1 is a perspective view on a reduced scale of a syringe projectile according to the invention and illustrating a bow for launching the projectile,

FIGURE 2 is an end elevation of the projectile with parts omitted,

FIGURE 3 is a fragmentary side elevation of the syringe projectile,

FIGURE 4 is a further side elevation of the projectile taken at right angles to FIGURE 3,

FIGURE 5 is a fragmentary central vertical longitudinal section taken on line 5—5 of FIGURE 2,

FIGURE 6 is a similar fragmentary horizontal section taken on line 6—6 of FIGURE 2 and showing the syringe plunger positioned for action upon impact of the projectile against the animal,

FIGURE 7 is an enlarged central vertical longitudinal section through the syringe needle and associated elements.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the numeral 10 designates a cylindrical tubular syringe barrel, preferably formed of a suitable plastics material, or the like, and being open at its rear end 11, and including a reduced forward tubular extension or neck 12, integral therewith. A tubular pointed needle 13 having a somewhat enlarged hub portion 14 is provided, and the hub portion 14 has a socket 15 adapted to receive the tubular neck 12 of the syringe barrel, as shown in the drawings. As indicated in FIGURE 7, the socket 15 and the tubular neck 12 may have screw-threaded engagement, or if preferred, the neck 12 may have a press fit within the socket 15 or may be otherwise releasably secured therein. The tubular needle 13 is preferably provided with a barb 16 to assure that the animal does not

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cast the projectile off before becoming fully injected with the fluid provided inside of the barrel 10.

A preferably hollow syringe plunger 17 is telescopically mounted for reciprocation within the barrel 10 and has a free sliding fit therein and includes a closed forward wall 18, as shown. At its rear end, the plunger 17 has a somewhat enlarged head 19 integral therewith, and being preferably internally screw-threaded at 20 for the reception of the forward screw-threaded end of an arrow shaft 21, formed of any desirable material. If preferred, the arrow shaft may have a tight press fit within the bore of the head 19 or may be secured therein with cement or by any other suitable means. The construction of the arrow shaft 21 may be otherwise conventional.

A pair of elongated retractile coil springs 22, arranged on opposite sides of the arrow shaft have their corresponding rear ends fixedly secured at 23 to the arrow shaft intermediate the ends of the same. The forward ends of the springs 22 are similarly fixedly secured to opposite sides of the syringe barrel 10, at 24, adjacent the rear end of the syringe barrel.

The syringe plunger 17 is provided with a plurality of longitudinally spaced transverse openings 25, formed through its side wall, to receive a frangible element or shear pin 26, preferably in the form of a small glass rod or tube, of a proper length to span the rear end of the syringe barrel 10, as shown in FIGURE 6. The shear pin 26 is selectively engageable through any of the transverse openings 25 of the plunger 17, to releasably secure the syringe plunger in selected adjusted positions within the syringe barrel.

The syringe barrel 10 has a visible graduated scale 27 marked thereon as shown in FIGURE 3, and preferably graduated in cubic centimeters or like units of measurement. The spacing of the transverse openings 25 in the syringe plunger is such that the desired fractional amounts of fluid within the syringe barrel, as indicated on the scale 27, may be injected into the animal. In this connection, any preferred number of the openings 25 may be provided in the plunger 17 and these openings may be spaced apart a greater or lesser distance than shown in the drawings, merely for the purpose of illustration. As indicated in FIGURE 6, with the shear pin 26 positioned within the forwardmost opening 25 of the plunger 17, the full volume of fluid within the syringe barrel will be injected into the animal after failure of the shear pin 26 due to impact of the projectile against the body of the animal. Lesser amounts of the fluid within the syringe barrel would be injected into the animal when the shear pin 26 is placed through the intermediate or rearmost opening 25 of the syringe plunger, as should be obvious.

When no shear pin is engaging through the opening 25, and the plunger 17 is at the extreme forward end of the barrel 10 and bottomed against the forward wall of the barrel, FIGURE 5, the retractile springs 22 are preferably under no tension or very slight tension merely to prevent them from sagging. When the plunger 17 is retracted rearwardly, FIGURE 6, and the glass shear pin 26 is engaged through one of the openings 25, the springs 22 are under considerable tension so that they may serve to project the plunger 17 forwardly within the barrel 10, upon failure of the shear pin 26, due to impact of the projectile against the animal.

The springs 22 are sufficiently strong to project the plunger 17 forwardly within the barrel 10, upon failure of the shear pin, to force all of the fluid in the barrel through the tubular needle 13 and into the tissue of the animal.

In use, the syringe is charged with the desired fluid, such as an anesthetic, serum or the like, and the frangible pin 26 is placed through the selected opening 25 of the

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plunger 17, which placement determines the amount of fluid to be injected into the animal upon impact. The arrow-like projectile is shot from a bow, as indicated in FIGURE 1, while the animal is at a safe distance, and the needle 13 will penetrate the animal's body and the barb 16 will readily anchor the needle in the flesh of the animal so that it cannot be readily dislodged by the animal.

Immediately upon impact with the animal, the glass pin 26 will shear or fail, and the force of the springs 22 will shift the plunger 17 forwardly within the syringe barrel to pump or inject the required amount of fluid through the needle 13 and into the tissue of the animal. Full and effective injection of the animal will thus take place automatically upon impact before the animal is able to dislodge the needle or escape. The advantages inherent in the use of this projectile will be readily apparent to anyone skilled in the art, such as doctors of veterinary medicine, hunters and the like.

The device may be recovered from the animal after it is rendered unconscious, and the device is reuseable merely by supplying a new shear pin 26 and resetting the plunger 17 in the manner described. The needle 13 being formed of metal is durable and the syringe structure is also durable and unbreakable, being formed of plastics material or the like. The arrow shaft 21 is readily replaceable in the event of breakage.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. An arrow-like syringe projectile for the remote injection of animals adapted to be projected from a conventional strung bow, comprising a syringe barrel adapted to contain fluid for injection into the animal, a tubular needle carried by the forward end of said barrel for penetration into the animal's tissue, a hollow plunger telescopically mounted within the rear end of said barrel for reciprocation and having a rear attaching part, an elongated arrow shaft anchored to said attaching part of the plunger and extending rearwardly of the barrel and plunger for a substantial distance so that the overall length of the projectile is substantially that of a hunting arrow normally used with a conventional bow, said arrow shaft having a nock in its rear end to engage the string of the bow, retractile spring means permanently interconnecting said barrel and arrow shaft and extending lengthwise of the arrow shaft in close relation thereto and urging the plunger forwardly within said barrel, said plunger provided intermediate its ends with a transverse opening, and a transverse frangible pin engaging through said transverse opening and spanning the rear end of said barrel and engaging said rear end and resisting the force of

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said spring means until the projectile strikes the animal, said frangible pin then failing upon impact of the projectile with the animal and allowing the spring means to force the plunger forwardly within the barrel to inject the animal with said fluid.

2. An arrow-like syringe projectile according to claim 1, wherein said spring means is a pair of elongated retractile springs on opposite sides of the barrel and arrow shaft and having their forward ends secured to the rear end of the barrel and their rear ends secured to the arrow shaft near the longitudinal center thereof.

3. An arrow-like syringe projectile according to claim 1, and wherein said rear attaching part of the plunger is an enlarged head having a screw-threaded bore extending axially of the hollow plunger and the forward end of the arrow shaft is screw-threaded and engaging within said screw-threaded bore, whereby the arrow shaft may be separated from the plunger.

4. An arrow-like syringe projectile for remotely injecting animals with fluid and adapted to be propelled by a strung bow, comprising a syringe barrel adapted to contain a desired quantity of fluid for injection into the animal, a tubular needle carried by the forward end of said barrel for penetrating the animal upon impact therewith, a plunger telescopically mounted within the rear end of said barrel and having a transverse opening intermediate its ends, an elongated arrow shaft secured to the rear end of said plunger and extending rearwardly of the barrel and plunger for a substantial distance so that the overall length of the projectile is comparable to the length of a conventional arrow for use with said bow, a retractile coil spring interconnecting the rear end of the barrel and said arrow shaft and extending lengthwise of the arrow shaft and close to the latter and urging the plunger forwardly within said barrel, and a transverse frangible pin engaging through said opening of the plunger and spanning the rear end of said barrel and resisting the force of said spring until the projectile strikes the animal, said pin then failing due to impact of the projectile with the animal and allowing the spring to force the plunger forwardly within the barrel to inject the animal with said fluid.

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