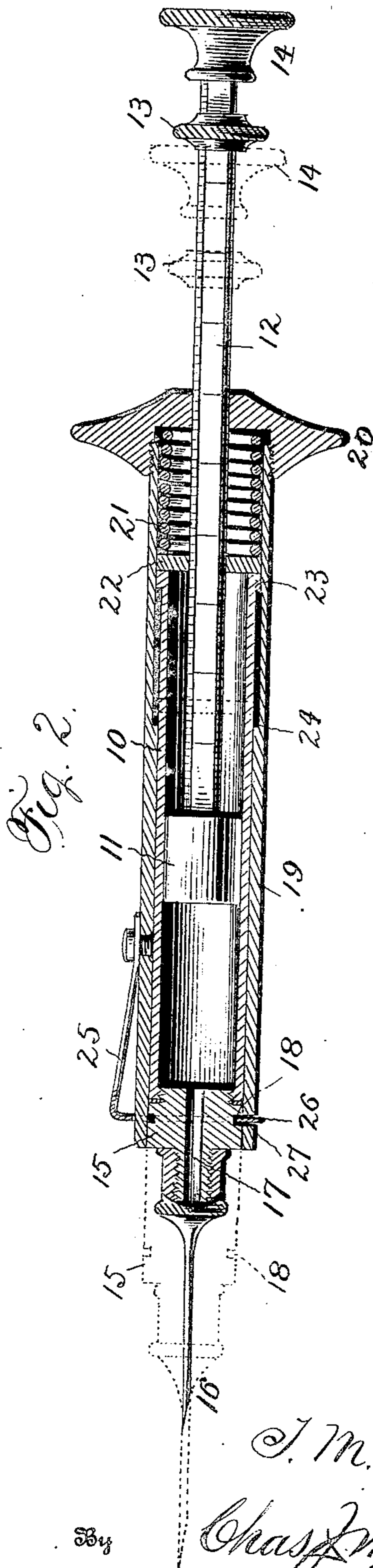
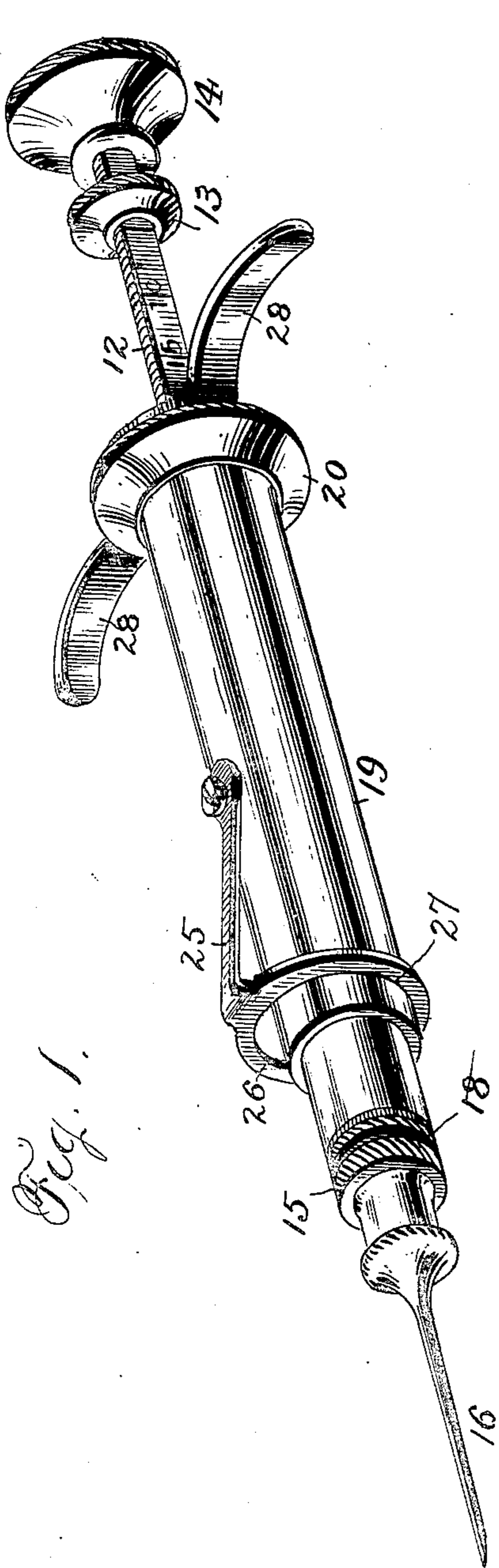


T. M. QUARLES.  
HYPODERMIC SYRINGE.  
APPLICATION FILED JUNE 16, 1908.

922,331.

Patented May 18, 1909.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## HYPODERMIC SYRINGE.

No. 922,331.

Specification of Letters Patent.

Patented May 18, 1909.

Application filed June 16, 1908. Serial No. 438,843.

*To all whom it may concern:*

Be it known that I, THOMAS M. QUARLES, of Washington, in the District of Columbia, have invented a certain new and useful Improvement in Hypodermic Syringes, and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a hypodermic syringe embodying my invention; and Fig. 2 a longitudinal section thereof, the parts being shown in full lines ready for unlatching for the automatic insertion of the needle, and in dotted lines in the position occupied after the automatic insertion.

The object of my invention is to provide a hypodermic syringe possessing the excellences of the syringe of United States patent to A. Dunbar No. 361,750, dated April 26, 1887, and certain important improvements which experience in the manufacture and sale of the syringe of that patent has shown to be necessary, that patent having been assigned to me, and syringes thereunder having been placed upon the market by me.

In the embodiment of my invention illustrated in the drawing, I employ a syringe barrel 10 and a piston 11, preferably of metal, at one end of a piston rod 12, having graduations as is common, to denote the amount of fluid to be injected, which graduations are cut or marked on a flat surface on the piston rod for the more convenient reading thereof, and also as is common, the piston rod is threaded for a nut 13 that constitutes a stop to positively restrict the expelling movement of the piston at the point when the desired amount of fluid has been injected. On its outer end, the piston rod has a cap or head 14, by which the piston may be manipulated to charge the barrel and to expel its contents. The barrel 10 consists of a simple tube having at one end a removable plug 15 that is threaded at one end to engage the thread in the barrel, and is threaded at the other end for attachment of the customary needle 16, and when the needle is removed the application of the customary cap, and said plug of course is perforated longitudinally from end to end by a hole 17. Intermediate its ends, the plug has an annular flange or enlargement preferably of the same diameter as the external diameter of the barrel, and in said flange is an annular groove 18

whose purpose will hereinafter appear. The object of the removable plug is to give access to the piston so that it may be conveniently treated to clean it or render it antiseptic, and to lubricate it when necessary.

The syringe barrel 10 is slidably mounted in a tubular shell or casing 19, which at its end nearer the piston rod head or cap has screwed upon it a cap or head 20 which is perforated for the passage of the piston rod, and between said cap or head 20 and the syringe barrel is interposed a coil spring 21, which normally tends to move the barrel longitudinally of its inclosing shell or casing in the direction toward the point of the needle, and preferably a disk or collar 22 is interposed between the end of the spring and the end of the barrel to afford a bearing for the spring end. Movement of the barrel by the spring is limited by a circumferential flange or enlargement 23 on the disk-engaged end of the barrel, and a shoulder 24 on the interior of the tubular shell or casing.

The syringe barrel may be moved into the tubular shell or casing against the pressure of the spring, and it is so moved preliminary to the automatic use of the syringe, and it is latched or held in position ready for operation by a latch that consists of a spring arm 25 which is secured at one end to the outside shell or casing, and at its other end has a ring 26 that encircles the shell or casing, and opposite the point of its connection with the spring arm plays in a slot 27 that is cut through the wall of the shell or casing, so that it may enter the circumferential groove or recess 18 in the flange of the plug 15 when said groove or recess by the inward movement of the syringe barrel aligns with the slot in the tubular shell or casing 19. By a slight pressure of the thumb on the latch arm 25, the syringe barrel will be released and instantly the barrel will be projected outward by the action of the spring 21, and the needle thrust into the flesh with such quickness and steadiness as to be wholly painless to the subject. After the insertion of the needle, the contents of the syringe are expelled and injected in the usual way by pressure of the thumb on the cap or head of the piston rod to move the piston through the barrel, and to afford a convenient bearing for the fingers in this operation, the casing head 20 is provided with diametrically opposite arms 28.

It will be observed that the operating spring is wholly outside the syringe barrel. This location of the spring results in several signal advantages. In the first place, it means a simplified construction because no modification of the syringe proper is necessary so that, as will be apparent, the entire instrument consists simply of a syringe of ordinary construction and the inclosing shell or casing and the operating spring and latch. Again, no movable body being present in the fluid-receiving portion of the syringe, as is the case in the Dunbar patent hereinbefore referred to, the entire fluid-containing portion of the syringe barrel is filled with fluid, and not, as is the case with the instrument of the Dunbar patent, partially with air and fluid, after the needle has been injected. Again, the spring being wholly outside the barrel, it can be made considerably larger and stronger than is possible with the construction of the Dunbar patent instrument, it being possible to give the spring a strength amply adequate for the proper operation of the instrument at all times. Another important feature of my instrument arises from the fact of the direct connection of the needle with the syringe barrel, or a connection by which the needle moves with the barrel. This enables the instrument to be easily, comfortably and safely set for automatic operation by pulling upon the piston rod head or cap, so that in the act of charging the syringe by pulling on the piston rod head or cap, the barrel may be drawn into the shell or casing into latch-engaging position. Any danger from scratching or cutting the hand of the operator by the point of the needle, which exists when the setting operation is effected by pushing upon the needle end of the apparatus, is thus wholly obviated. If for any reason the

injection of the needle automatically should not be desired, my instrument can be used in the ordinary way by hand insertion of the needle.

As I prefer to construct it, my instrument is all metal, a thing that simplifies its construction and renders it practically indestructible.

Having thus described my invention, what I claim is—

1. The combination of a syringe comprising a needle-carrying barrel and a piston movable therein, and a piston rod having a handle, a tubular shell or casing in which said barrel is slidably mounted, a spring within the tubular shell or casing wholly outside of the fluid-containing portion of the barrel and directly acting to move the barrel, the piston being movable by the piston rod independently of the spring and a latch to hold the barrel from movement by the spring.

2. The combination of a syringe comprising a barrel having at one end a plug threaded to engage the barrel and threaded to engage the needle, and an annular enlargement having a circumferential notch or recess, and a piston in said barrel having a head-carrying piston rod, a tubular shell or casing in which said barrel is slidably mounted having a latch to engage said circumferential recess, and a spring within said shell or casing interposed between one end of the barrel and a head on said tubular shell or casing the piston being movable by the piston rod independently of the spring.

In testimony that I claim the foregoing I have hereunto set my hand.

THOMAS M. QUARLES.

Witnesses:

CHAS. J. WILLIAMSON,  
K. WILLIAMSON.