

W. BALL.
HYPODERMIC SYRINGE.
APPLICATION FILED NOV. 28, 1908.

938,544.

Patented Nov. 2, 1909.

Fig. 1.

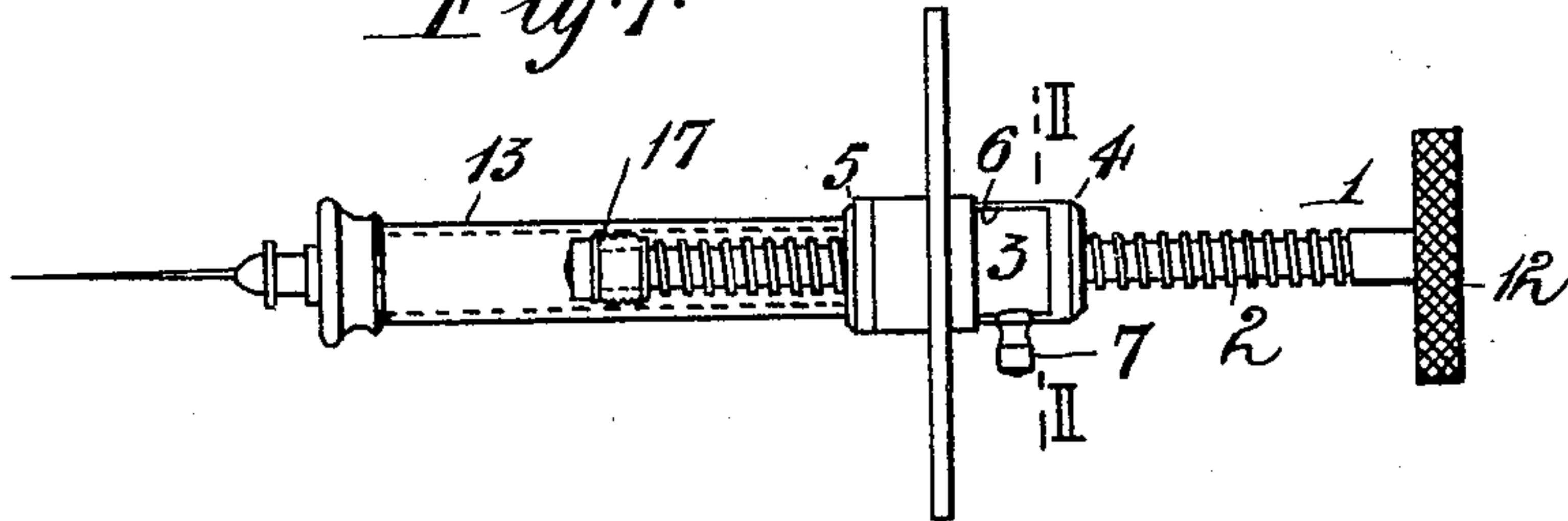


Fig. 2.

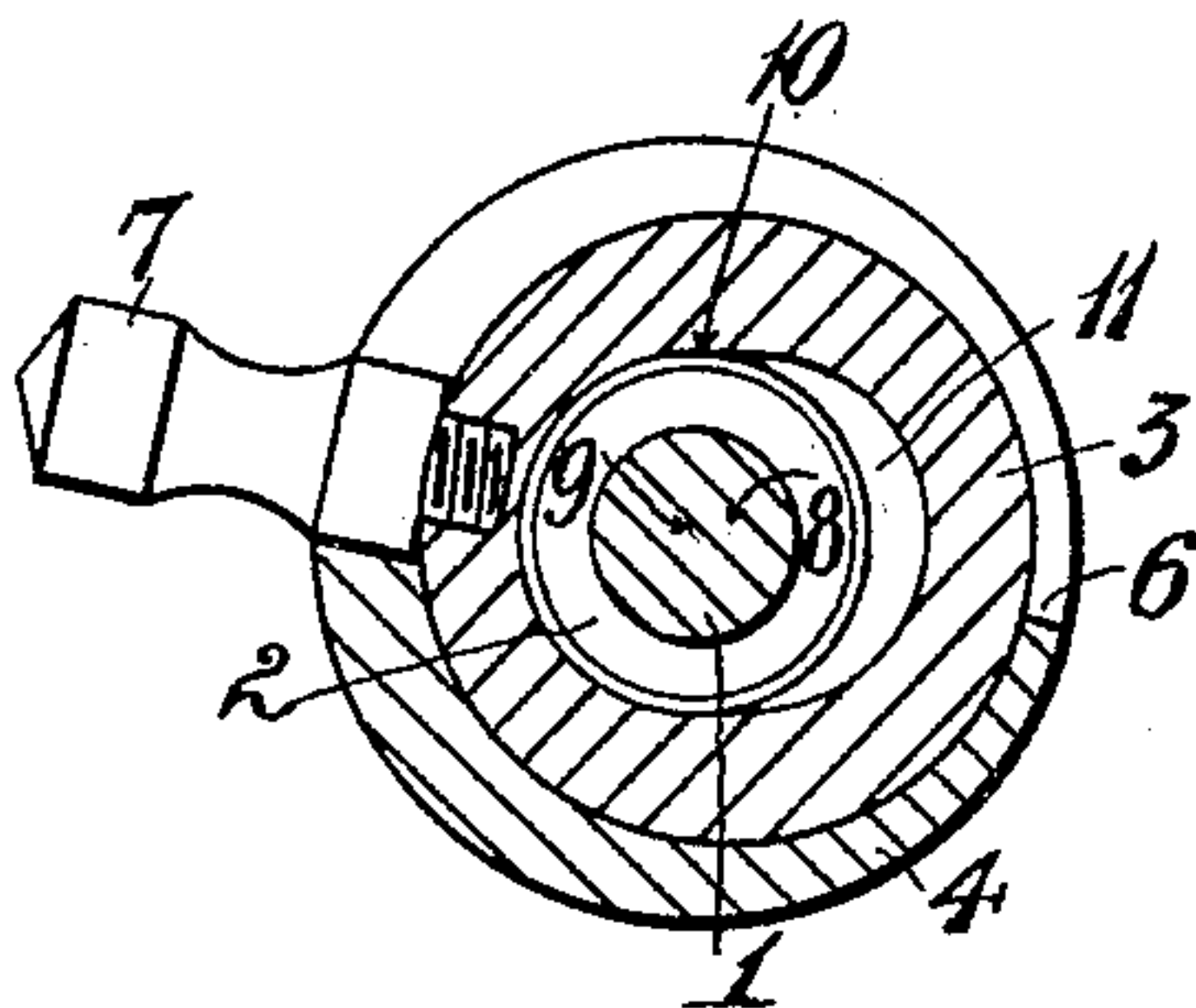


Fig. 3.

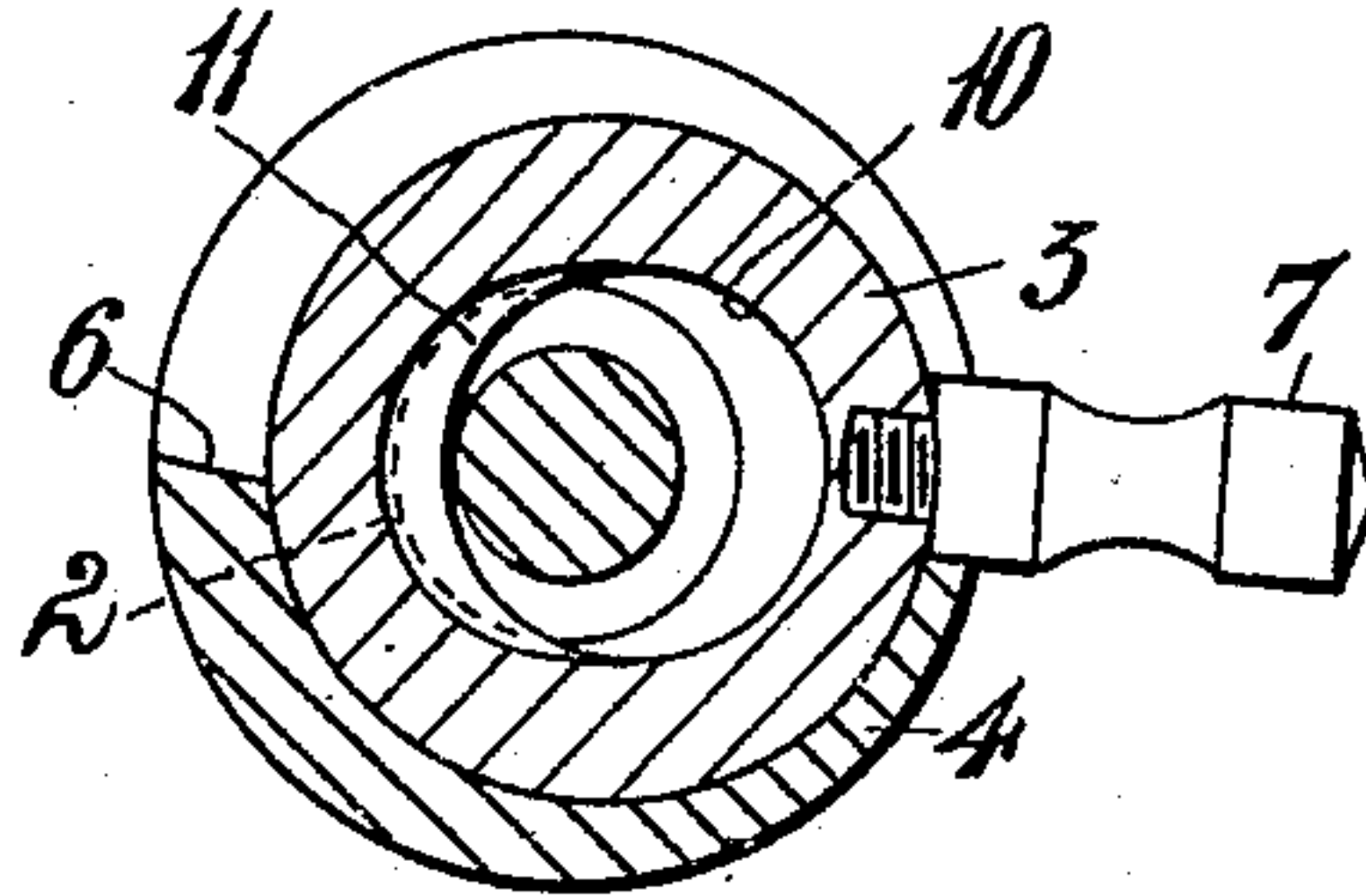


Fig. 4.

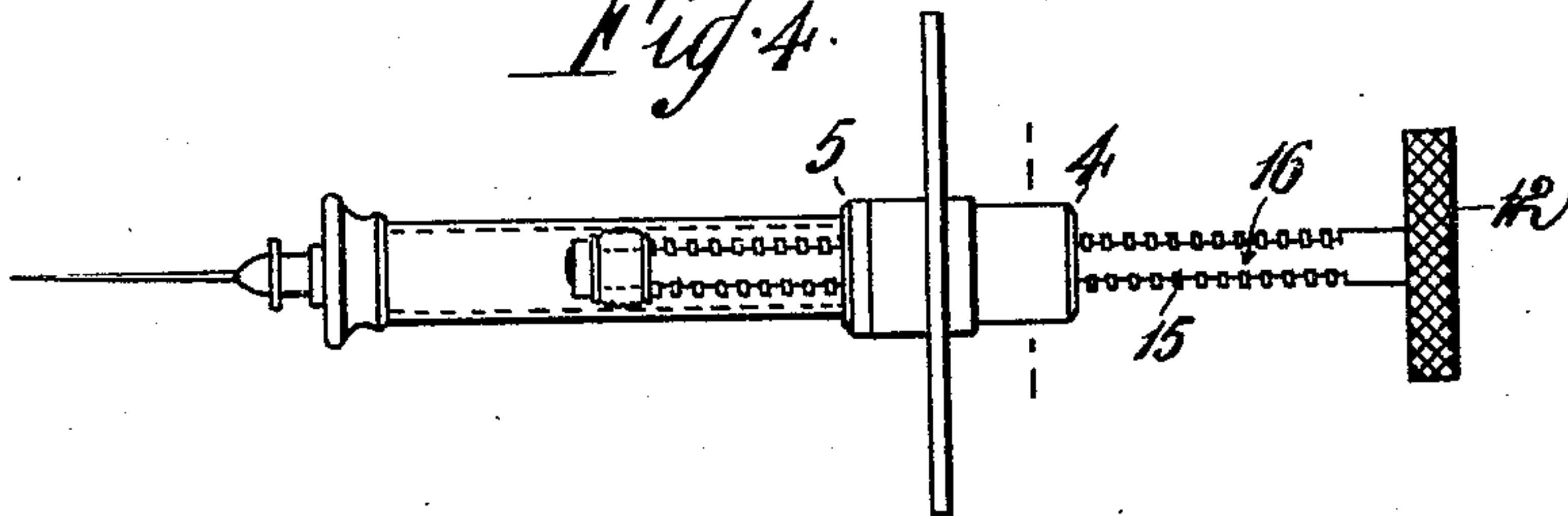


Fig. 5.

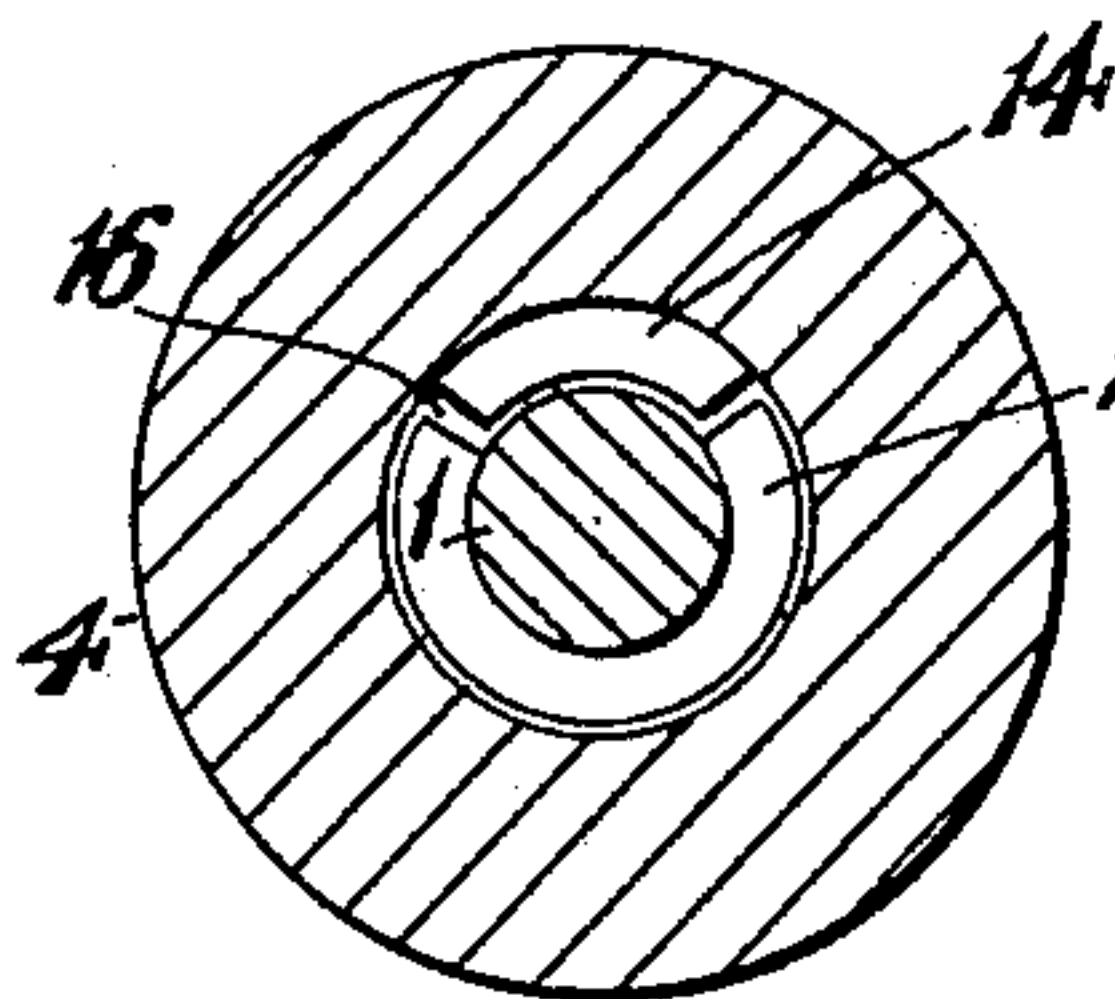


Fig. 6.

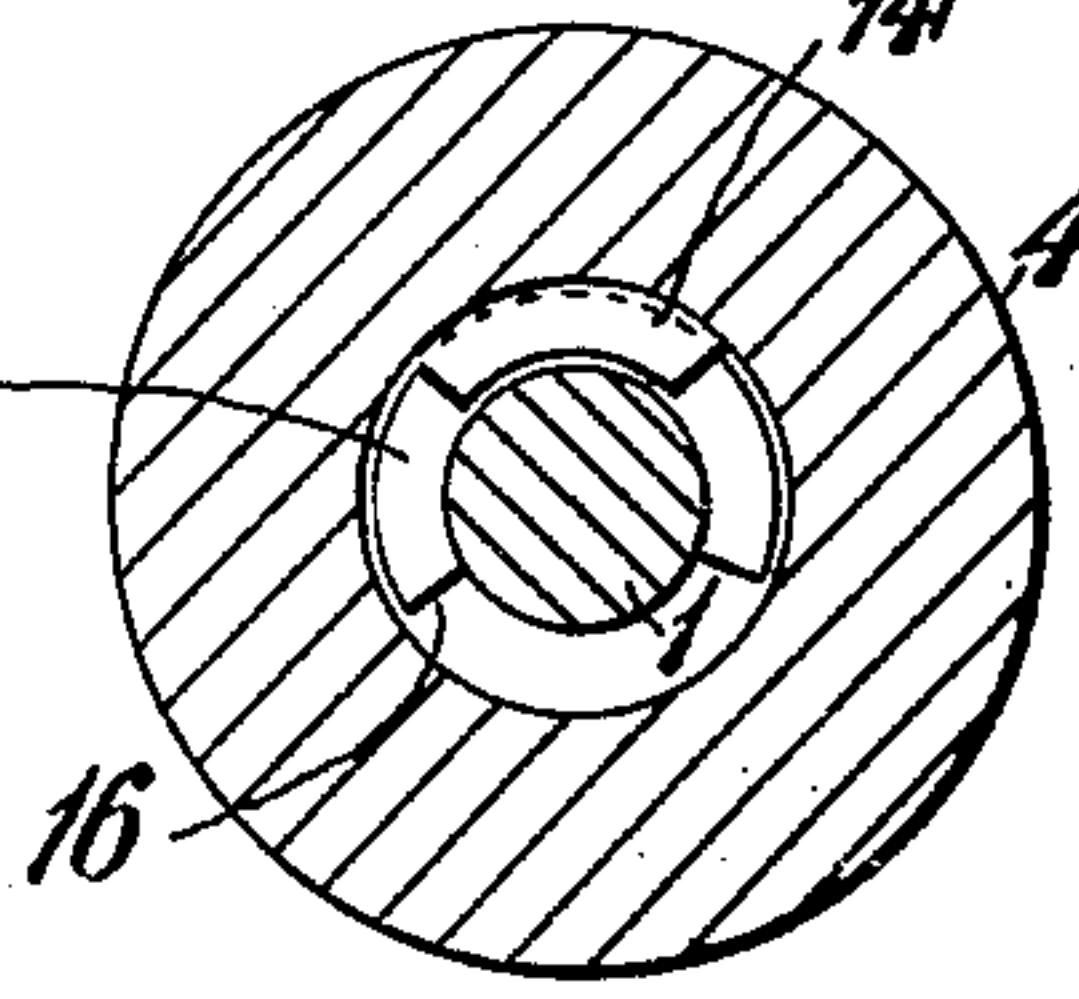
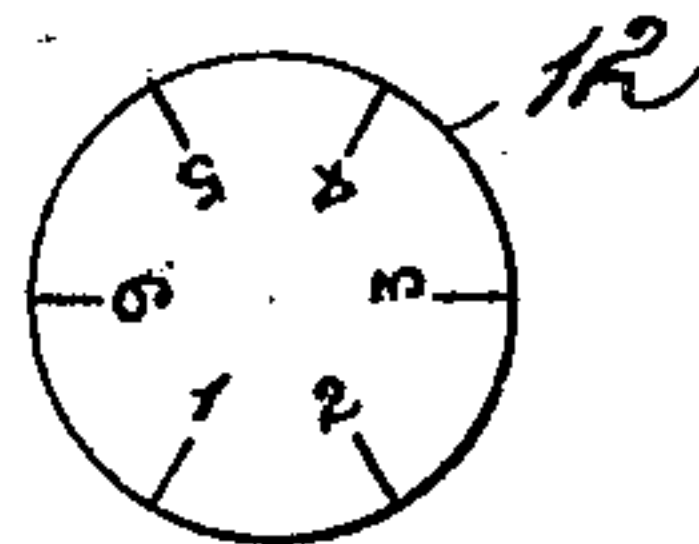


Fig. 7.



Witnesses

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WILLIAM BALL, OF ECHUCA, VICTORIA, AUSTRALIA.

HYPODERMIC SYRINGE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM BALL, a subject of the King of Great Britain, residing at Millewa Chambers, High street, Echuca, in the State of Victoria, Commonwealth of Australia, surgeon dentist, have invented an Improved Hypodermic Syringe, of which the following is a specification.

This invention consists of a hypodermic syringe usable for injecting fluid for anesthetic or therapeutic purposes and its essential advantage over other syringes for this purpose is that the piston rod is screw threaded, and furthermore it may be so arranged that said fluid may be drawn in and also delivered to the needle by the direct pull or push of the hand with the piston in the ordinary manner, while said piston may also be at any moment screw fed, whereby the pressure of the fluid may be accurately regulated. Moreover by this means the operator's hand is relieved of pressure which formerly often resulted in injury thereto when forcing fluid into dense tissues or muscular structures, and again by this construction the liability of breakage to the needle is greatly diminished.

The invention is illustrated by the accompanying drawings whereof;—

Figure 1 is a view of the improved syringe, and Figs. 2 and 3 enlarged transverse sections on line II—II thereof showing the syringe set for the push and screw feeding of the piston head. Figs. 4, 5, and 6, are corresponding views to Figs. 1, 2, and 3, showing a modification of the invention, and Fig. 7 is a rear end view of the piston.

According to this invention the stem 1 of the piston is formed with screw threads 2 and passes through a collar 3 rotatably seated within the rear end 4 of the metallic casing 5 of the syringe. The casing is formed with a peripheral slot 6 through which a small stud 7 secured to said collar projects and by means of which the latter may be partially rotated when desired.

The axis 8 of the collar is eccentric to the axis 9 of the piston, and the bore 10 of said collar has on one side a few interrupted female threads 11 cut therein which taper at each side as shown to a point. The rear end 4 of the casing with the threaded collar therein is hereinafter referred to as a nut.

The threads 2 of the piston stem are adapted normally to pass freely through the bore 10 of the collar as shown in Fig. 2 when the

piston is pushed forward in the usual manner, but when the screw feed is required the collar is partially rotated within the casing by means of the stud 7 into the position shown in Fig. 3. The effect of this movement is to bring the internal female threads 11 of the collar immediately into engagement with the male threads 2 of the piston stem, when by rotating the milled head 12 of said stem, a screw feed of a uniform and accurate character will be imparted to the piston.

It will be seen that by turning the stud of the collar in one direction or the other by means of the operator's finger that the threads of the piston stem and collar may be immediately disengaged or engaged, thus converting the syringe into a push or screw feed at will.

If desired the rear face of the milled head 12 of the stem may be calibrated as shown in Fig. 7 so as to enable the operator to regulate the injection carefully when the usual graduations marked on the sides of the glass cylinder 13 of the syringe cannot be conveniently seen.

In order to dispense with the necessity of bringing into use one of the operator's fingers to change the piston from the push to the screw feed or vice versa, the modification shown in Figs. 4, 5, and 6, may be adopted. In this case the collar stud and slot in the casing are unnecessary and said casing is formed with a few internal interrupted threads 14 in its rear end or nut 4, while the threads 15 of the piston stem are also interrupted and a longitudinal recess 16 is formed in the stem between the ends of the interrupted threads thereof.

When the threads are disengaged, *i. e.* when the internal teeth of the chamber are in the recess 16 of the stem as in Fig. 5 the piston is free to move longitudinally by means of a push stroke, but by partially rotating the piston or its casing without releasing the hold of the instrument by either hand, the teeth on the stem of the piston are brought into engagement with those of the casing as in Fig. 6 and a screw feed is obtained.

The piston head 17 is loosely attached to the stem 1 so that when the latter is rotated the head simply moves directly forward against the contents of the syringe without any unnecessary rotation.

Having now particularly described and

ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a hypodermic syringe, a casing provided at the rear end with internal interrupted threads, a piston provided with a threaded stem adapted to engage with said threads and means to put the threads of said piston stem and said casing in or out of engagement for the purpose specified.

2. In a hypodermic syringe, a casing, a piston provided with a threaded stem, a partially rotatable collar within said casing mounted eccentrically to said stem which passes therethrough, internal interrupted threads in said collar and means to partially rotate said collar as and for the purpose specified.

3. In a hypodermic syringe, a casing, a piston provided with a threaded stem, a partially rotatable collar within said casing mounted eccentrically to said stem, which passes therethrough, a central bore in said collar formed in one side with internal

threads tapering at each end, a peripheral slot in said casing and a stud on said collar projecting through said slot as and for the purpose specified.

4. In a hypodermic syringe, a cylinder, a piston and a piston rod, the cylinder provided with a threaded nut, the rod threaded to cooperate with the nut, one of said threads being interrupted.

5. In a hypodermic syringe, a cylinder, a piston and a piston rod, the cylinder provided with a threaded nut, the rod threaded to cooperate with the nut, one of said threads being interrupted, and means for throwing the threads of the rod and nut into and out of engagement.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM BALL.

Witnesses:

SELINA JANE BELL,
ALBERT VICTOR ELLIS.