

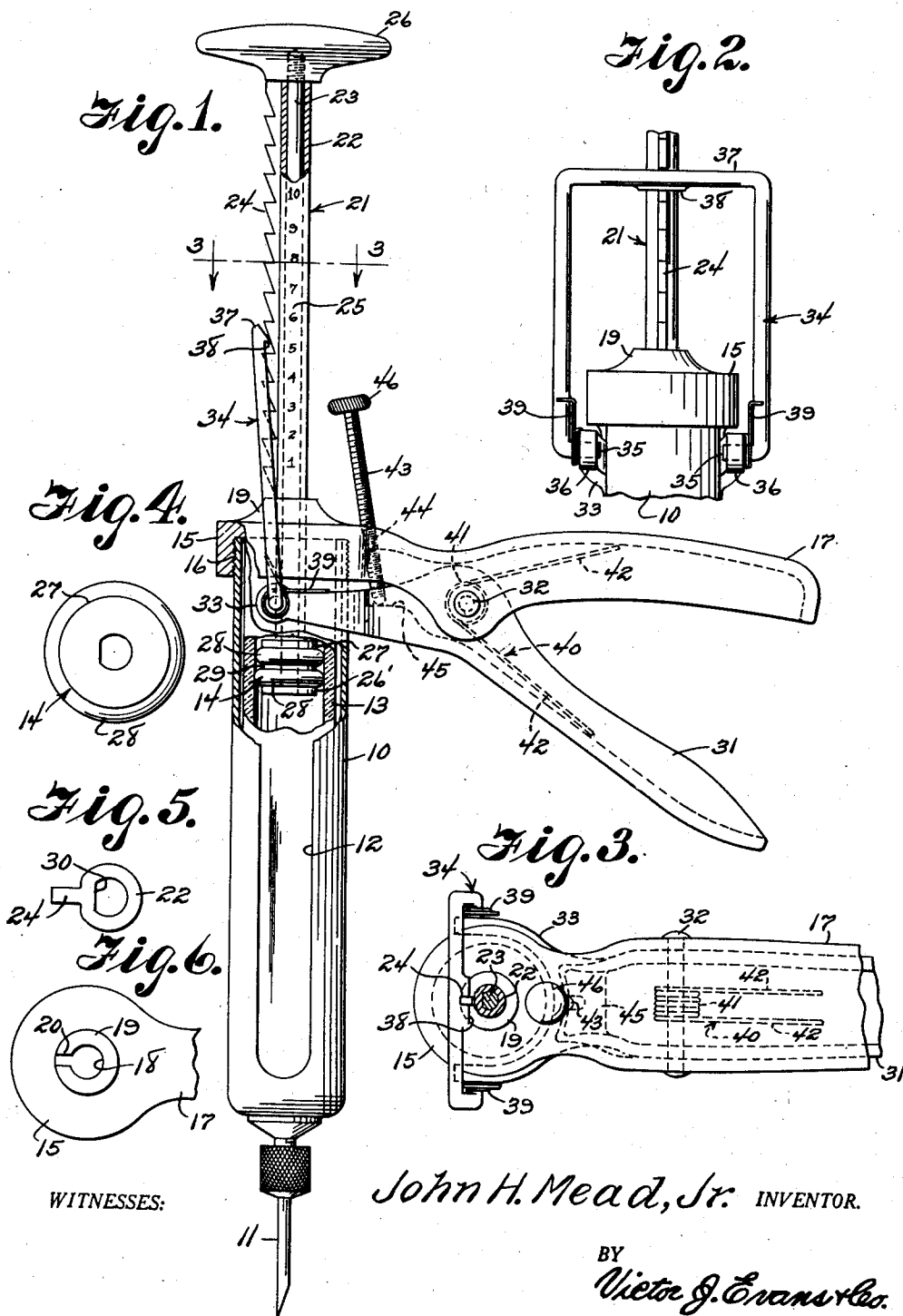
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VACCINATING SYRINGE

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WITNESSES:

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VACCINATING SYRINGE

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2 Claims. (Cl. 128—215)

This invention relates to a vaccinating syringe and has for an object to provide a device of this character having simplified means for regulating the dosage so that a predetermined dosage will be repeated each time the syringe is operated.

A further object is to provide a device of this character in which the piston rod is positively held against axial rotation so that the ratchet device for operating the piston cannot become dislodged from operative position.

A further object is to provide apparatus of this character which will be formed of a few strong, simple and durable parts, which will be inexpensive to manufacture, and which will not easily get out of order.

With the above and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawing forming a part of this specification:

Figure 1 is a side elevation, partly broken away, of a syringe constructed in accordance with the invention.

Figure 2 is a detail front elevation showing the pawl and ratchet teeth of the ratchet device for operating the piston.

Figure 3 is a cross sectional view of the syringe taken on the line 3—3 of Figure 1 showing the flat surfaces on the nested shafts comprising the piston rod, and showing the notched boss on the closure cap receiving the ratchet teeth, this feature preventing rotation of the piston.

Figure 4 is a bottom plan view of the piston.

Figure 5 is a top plan view of the piston rod with the knob removed.

Figure 6 is a detail plan view of the upper closure cap of the barrel of the syringe showing the notch to receive the ratchet teeth of the piston rod.

Referring now to the drawing in which like characters of reference designate similar parts in the various views, 10 designates the barrel of the syringe, the same being provided at its lower end with a conventional needle 11 and having a longitudinal side opening 12 through which an antitoxin supply in a glass tube 13 may be viewed. The glass is disposed axially in the barrel and receives a piston 14 for injecting the antitoxin.

The barrel is closed at its upper end by a flanged cap 15 which has screw threaded connection 16

with the barrel. The cap is provided on one side with an integral handle 17. The cap is provided with a central opening 18 to receive the rod of the piston 14 and a boss 19 surrounds the opening, both the boss and the opening having a notch 20 to receive the ratchet teeth of the piston rod and prevent rotation of the piston rod in the cap 15.

The piston rod 21 is formed of a hollow tube 22 in which is nested a solid rod 23. The tube is provided on one side with ratchet teeth 24 and is marked with a scale as shown at 25. A knob 26 is threadedly engaged with upper end of the rod and bears against the top of the tube.

The before mentioned piston 14 comprises a disk 26' fixed to the lower end of the rod 23, a disk 27 fixed to the tube, and a pair of rubber washers 28 confined between both disks on the lower end of the rod and separated by a rubber washer 29. By screwing the knob 26 down on the solid rod 23 the rubber washers 28 are compressed so that they fit the glass tube 13 tightly.

The rod 23 is provided on one side with a flat surface and the tube 22 is provided with a flat surface 30 in its bore. The flat surfaces contact each other and prevent relative rotation of the tube and the rod so that backing off of the knob 26 with consequent release of compression on the rubber washers is prevented.

For actuating the piston an operating lever 31 is pivotally connected to the handle 17 by a pivot pin 32 and is provided with a forked working end 33 which receives the barrel 10, see Figures 2 and 3. An inverted U-shape pawl 34 is provided with gudgeons 35 at the lower end which are received in eyes 36 formed on the ends of the branches of the forked working end of the operating lever. The cross member 37 of the pawl is equipped with a tooth 38 which engages the ratchet teeth 24. A helical spring 39 is sleeved on each gudgeon and has one end connected to the respective eye 36 and has the other end engaging the pawl to hold the tooth 38 in operative engagement with the ratchet teeth 24.

When the handle 17 and operating lever 31 are grasped in one hand the grip may be closed on the handle and the operating lever to rock the forked end of the operating lever downward to pull the pawl downward and actuate the piston rod 21 to move the piston on its ejecting stroke. When the operator's grip is released on the handle and the operating lever, a leaf spring 40 returns the operating lever to normal position to lift the pawl to a new position on the ratchet teeth ready for the next operation. The spring 40 is provided with a central helical coil 41, see Figure 3,

which is sleeved on the pivot pin 32. The legs 42 of the spring engage the handle 17 and the operating lever 31 and normally hold these parts in released position, see Figure 1.

For regulating the dosage so that the same dosage will be inserted each time the plunger is moved on its ejecting strokes, a threaded pin 43 is engaged in a threaded opening 44 formed in the handle 17. The lower end of the pin lodges against a shoulder 45 formed on the operating lever when the operating lever is released after each operation of the syringe and limits movement of the pawl 24 to a predetermined upstroke so that the pawl will ride over a predetermined number of teeth before coming to rest back of a predetermined tooth, corresponding to the definite dosage to be injected during the next operation of the piston. The threaded pin 43 is equipped with a knurled head 46 permitting easy turning of the pin to an adjusted position.

The knob 26 is used as a handle to reload the syringe after it has been emptied. This reloading is done by grasping the knob 26 in the right hand and the handle 17 with the left hand, then disengaging pawl 37 and placing the needle 11 into antitoxin, then pulling the knob 26 back to the starting position.

Since the operation of the parts has been described as the description of the parts progressed it is thought the invention will be fully understood without further explanation.

What is claimed is:

1. A syringe comprising a body, rubber washers in the body forming a piston, an outer tube disposed axially in the body having a longitudinal flat surface in its bore, an inner rod in the tube having a longitudinal flat surface engaging the flat surface of the tube and preventing relative rotation of the tube and the rod, said tube and said rod forming a piston rod, a knob threadedly engaged on the upper end of the rod and bearing against the top of the tube, a disk fixed to the tube above the rubber washers, a disk fixed to the lower end of the rod below the rubber washers, said knob when advanced on the rod engaging the

tube and compressing the washers between the disks so that they fit the body tightly, the non-relative rotation of the tube and the rod preventing backing off of the knob with consequent release of compression of the rubber washers, a spring pressed operating lever fulcrumed on the body, ratchet teeth extending longitudinally of the piston rod, a branched operating end on the lever receiving the body, an inverted U-shaped pawl pivotally connected to the ends of the branched end of said operating end engaging the ratchet teeth, a spring carried by said branched end yieldably holding the pawl in engagement with the ratchet teeth, a handle extending laterally from the upper end of the body, a threaded pin engaged in a threaded opening in the handle, and a shoulder formed on the operating lever, said pin engaging the shoulder when the operating lever is returned to normal position by its control spring after each operation and limiting resetting movement of the pawl to regulate the dosage.

2. A syringe, comprising a body, a piston within the body, a tube connected to the piston, a rod in the tube and connected to the piston and held against rotation therein, rubber washers on the piston, means operated by the relative movement of the tube and rod for compressing the washers, a laterally extending handle carried by the body, a spring pressed operating lever fulcrumed on the handle and having a branched end straddling the body, ratchet teeth extending longitudinally of the tube, an inverted U-shaped pawl pivotally connected to the ends of the branched end of the operating lever and engaging the ratchet teeth, a spring carried by said branched end yieldingly holding the pawl in engagement with the ratchet teeth, a threaded pin engaged in a threaded opening in the handle, and a shoulder formed on the operating lever, said pin engaging the shoulder when the operating lever is returned to normal position by its control spring after each operation and limiting the resetting movement of the pawl to regulate the dosage.

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