

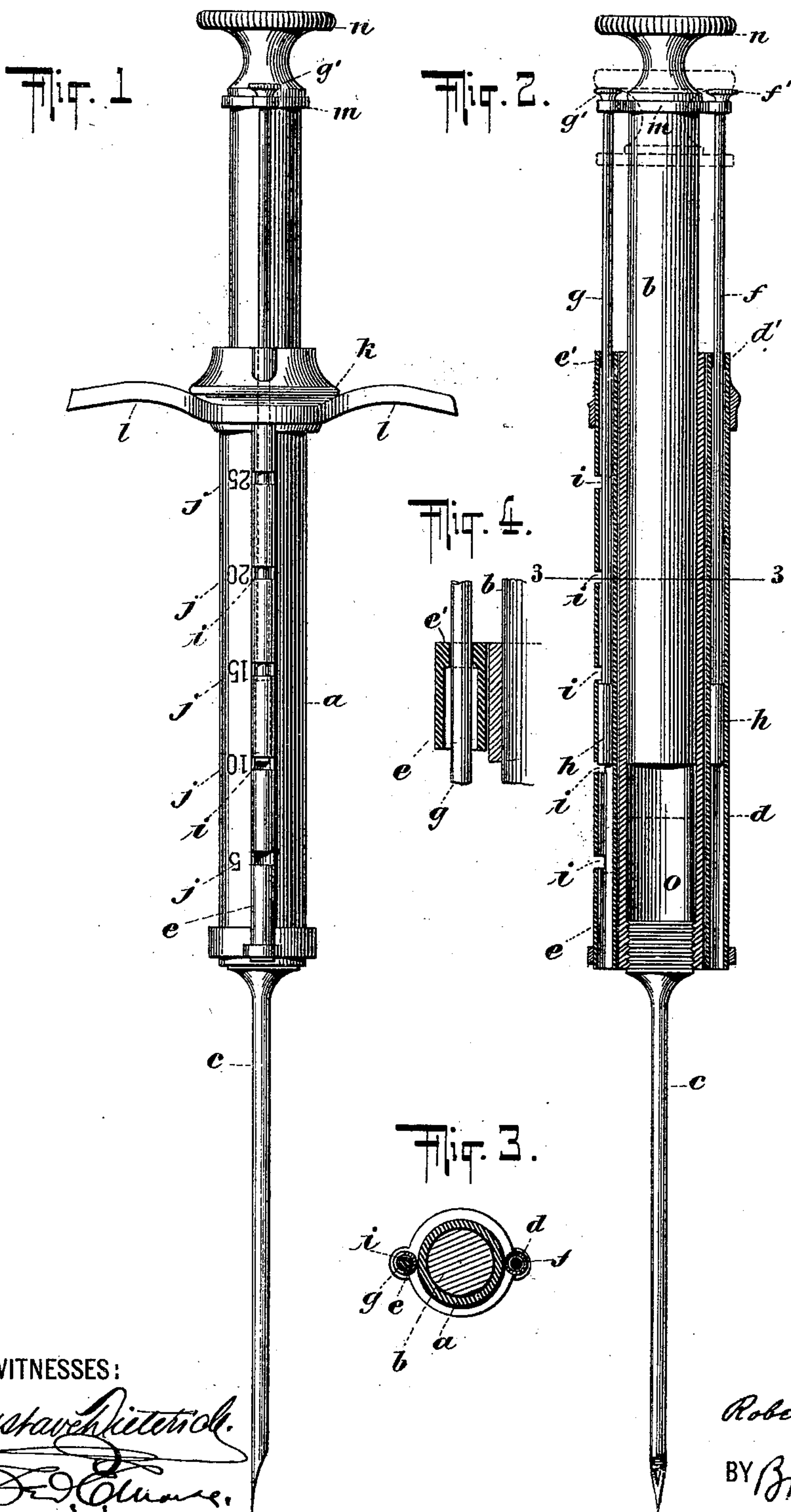
No. 637,405.

Patented Nov. 21, 1899.

R. PAPENDELL.
HYPODERMIC SYRINGE.

(Application filed Jan. 21, 1899.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

ROBERT PAPENDELL, OF NEW YORK, N. Y., ASSIGNOR TO CHARLES J. TAGLIABUE, OF SAME PLACE.

HYPODERMIC SYRINGE.

SPECIFICATION forming part of Letters Patent No. 637,405, dated November 21, 1899.

Application filed January 21, 1899. Serial No. 702,898. (No model.)

To all whom it may concern:

Be it known that I, ROBERT PAPENDELL, a subject of the Emperor of Germany, residing in New York, borough of Brooklyn, county of Kings, State of New York, have invented certain new and useful Improvements in Hypodermic Syringes, of which the following is a specification.

My invention relates to hypodermic syringes, and has for its object to improve the construction thereof, and is more especially directed to devices for indicating the amount of fluid contained in the syringe, for providing for ejection of air from the syringe prior to the use thereof by moving the piston without thereby changing the relative positions of the elements of the measuring device, and also for preventing the piston from being entirely withdrawn from the barrel.

My invention will be explained with reference to the accompanying drawings, forming a part hereof, in which I have shown a syringe embodying my invention, the said syringe being merely one of the forms in which my invention may be clothed.

In the drawings, Figure 1 is a detail side view of the syringe. Fig. 2 is a longitudinal section thereof. Fig. 3 is a section on line 3 3 of Fig. 2, and Fig. 4 is an enlarged detail sectional view of the upper end of one of the guide-tubes.

In the drawings, *a* is the barrel of the syringe. *b* is the piston, of uniform diameter throughout, and *c* the hollow needle. At one or both sides of the syringe body or barrel I place a guiding device or devices, preferably in the form of tubes *d e*. Working in these tubes or guiding devices are rods *f g*, shown as provided with heads *h*, which is the preferred form of construction for the reason that the said heads contact with the partially-closed rear ends *d' e'* of the tubes *d e* to prevent the piston from being entirely withdrawn from the barrel. In fact, the length of the heads *h* constitutes a gage to determine the length of the piston which will remain within the barrel when the head contacts with the partially-closed or constricted rear ends *d' e'* of the guides. The tube *e* is preferably slit at determined points *i*, corresponding to any given system of measures, as shown by

the indices *j* on the outside of the piston-barrel. These slits or apertures constitute divisions between adjacent sections of the tubular guide. The rods *f g* pass upward through the rear collar *k*, (which may be provided with the usual wings *l*), and are received and guided in an apertured yoke *m*, carried by the piston, which piston is likewise provided with a cross-head *n*, against which the inner or front faces of the nuts *f' g'* of the rods *f g* are adapted to contact, as will be explained. The syringe is so arranged and adjusted that when the lower end of the head *h* of the rod *g* registers with the edge of an opening the barrel of the syringe, below the piston, will contain a given quantity of material, indicated by the index placed opposite the slit. Thus in the example shown the syringe is provided with a scale of minims or drops, and when the parts are in the position shown in the drawings the figure 10, taken with the juxtaposition of the head *h* with the adjacent slot *i*, indicates that the space *o* below the piston has a capacity of ten minims, and consequently when this space is filled with liquid by the suction of the piston or otherwise the syringe will contain ten minims of fluid. It will thus be seen that the measuring device will clearly indicate the amount of the contents of the syringe at all times, and consequently the syringe-barrel may be made wholly of metal. In fact, I habitually construct all the parts of the syringe of metal, for obvious reasons. The piston may be retracted freely in the bore of the barrel until the heads *h* contact with the partially-closed ends *d' e'* of the tubes, when the piston will be stopped from further outward movement. When it is desired to remove the piston, the head *n* and the nuts *f' g'* are unscrewed, when the piston may be withdrawn freely from the barrel. It will be observed that by reason of the fact that the rods *f g* pass freely through the yoke *m* that when the piston commences to descend the said rods will not be carried along with it until the cross-head *n* comes in contact with the nuts *f' g'*, as shown clearly in dotted lines in Fig. 2. This feature of my invention enables the air to be expelled from the syringe by movement of the piston without disturbing the relative positions of the elements of the meas-

uring device. After the liquid has been drawn into the cylinder and needle put on a small amount of air exists in the bore of the needle, and it is desirable that the air shall not be
 5 injected into the patient along with the liquid. To this end the piston is given a slight movement to force liquid into the bore of the needle. This can be done without disturbing the relative positions of the slotted tubes and
 10 the heads *h*. It will of course be understood that as the piston is propelled farther into the barrel the rods *f g* will partake of the movement of the piston, and when the piston is retracted in the barrel the yoke *m* will cause
 15 the rods to partake of the outward or retracting movement of the piston.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

20 1. In a hypodermic syringe, the combination of a barrel provided with one or more tubular guides on the side or sides thereof, with apertures between adjacent sections of the guide or guides, and a rod or rods connected
 25 to the piston and working in the guide or guides and adapted to indicate the amount of fluid contained in the barrel by their juxtaposition with the apertures between the guide-sections.

30 2. In a hypodermic syringe, the combination of piston and barrel with the notched

guide-tube *e* and the rod *g* working in the said guide-tube, the juxtaposition of the rod and notches serving to indicate the amount of liquid which may be contained in the syringe. 35

3. A hypodermic syringe adapted for the expulsion of air without disturbing the position of the measuring device comprising a piston-barrel and piston and a device carried thereby for indicating the amount of liquid
 40 which may be contained in the syringe and means whereby lost motion ensues between the piston and an element of the indicating device at the beginning of the stroke of the piston. 45

4. In a hypodermic syringe, the combination of a piston, a barrel carrying on the side thereof a tubular guide divided into sections by open spaces, a scale with its indices in
 50 proximity to the open spaces and a rod connected to the piston, working in the guide, and so proportioned and arranged with respect to the piston and guide, as to register with one of the said open spaces when the
 55 amount of fluid corresponding to the index of the scale nearest said open space is contained within the barrel.

ROBERT PAPENDELL.

Witnesses:

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