No. 801,912. PATENTED OCT. 17, 1905.

G. REHMANN.

SYRINGE.

APPLICATION FILED OCT. 27, 1904.

Fig. 1

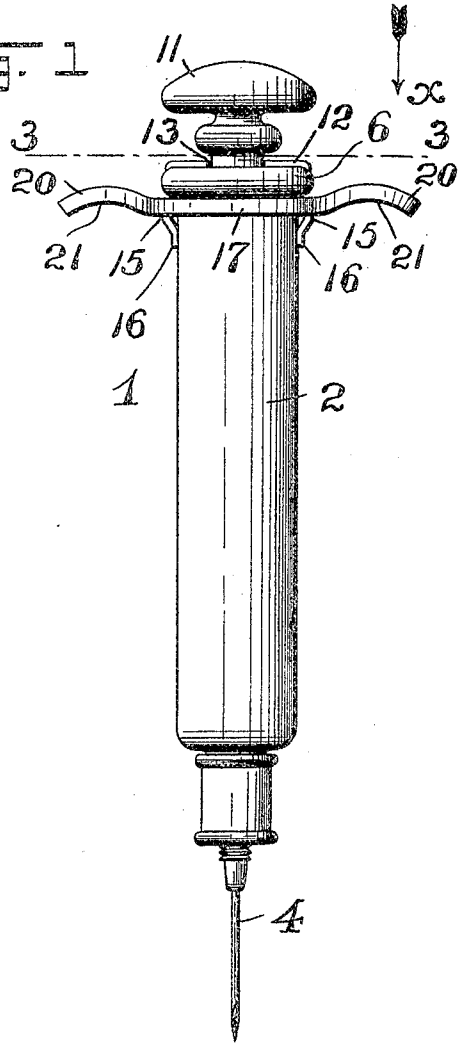
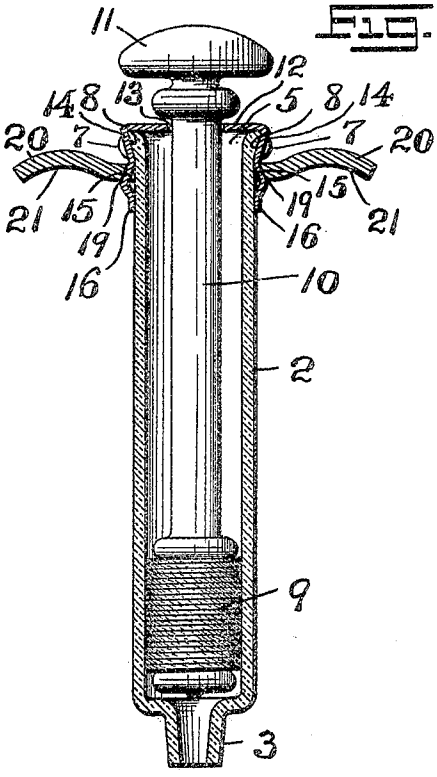


Fig. 2



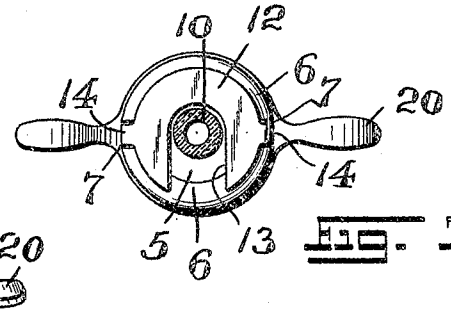


Fig. 3

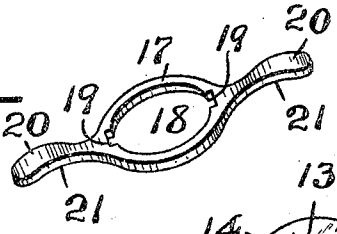


Fig. 4

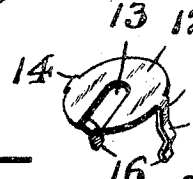


Fig. 5

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SYRINGE.

No. 801,912. Specification of Letters Patent. Patented Oct. 17, 1905.

Application filed October 27, 1904. Serial No. 230,208.

To all whom it may concern:

Be it known that I, GUSTAVE REHMANN, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Syringes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates more especially to that class of syringes which are used for hypodermic injections; and the invention relates more particularly to that class of glass syringes such as are carried by physicians and others and are used for the purpose of injecting medicines into the body of a person.

The main purpose of this invention is to provide a syringe which without difficulty can be kept perfectly clean and antiseptic, the parts of the syringe embodying the principles of my present invention being readily separable for the quick removal of the plunger from its cylinder for cleaning and sterilizing the same and then being just as quickly replaced or assembled to provide an operative and easily-manipulated device.

The invention has for its further object to provide with the cylinder or barrel of the syringe a suitable guide-plate adapted to be arranged over the upper open portion of the cylinder; to provide a guide for the piston-stem to prevent the friction between the piston and the inner side of the cylinder, and to provide a perfectly-centered piston within the cylinder whereby the danger of breaking the stem of the piston, which is usually made of glass, is clearly overcome.

My invention is applicable to all kinds and styles of syringes, but is preferably employed with such syringes the body or cylinder of which and its piston-stem and finger piece or knob are made of glass.

Glass syringes have heretofore been made, such syringes comprising a glass cylinder or barrel provided at its upper open end with an annular flange or holding portions of glass for retaining the cylinder or barrel between the fingers when forcing the piston or plunger into the cylinder while making an injection. It has been found in practice that unless this annular flange or the holding portions of glass are made sufficiently large but very little purchase is presented to the fingers during the operative manipulation of the syringe, often causing the syringe to slip from between the fingers while applying pressure upon the plunger, thereby causing a distortive movement of the cylinder and adding to the danger of breaking or snapping off the hypodermic needle in the body of the patient. It has also been found in practice that where the glass cylinders or barrels of the syringes are made with integral holding-flanges of glass such flanges very often are broken away when the pressure is applied, thus rendering the syringe liable to the same objectionable and serious results previously stated. It is with a view of overcoming these serious defections in glass syringes and to provide a syringe which can be readily and firmly held between the fingers without in the least interfering with the easy manipulation of its piston or plunger that I have provided the features and the arrangements and combinations of the devices and parts to be hereinafter more particularly specified.

My present invention consists, primarily, in the novel syringe hereinafter set forth, and, furthermore, this invention consists in the arrangements and combinations of the various devices and parts comprising a finger-piece and holding means, a plunger or piston-guide, and a plunger or piston for the cylinder, all separably arranged in their relative and operative positions with relation to the upper open end of the cylinder or barrel and which will be more fully described in the accompanying specification and then finally embodied in the clauses of the claim which are appended to and form an essential part of this specification.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a hypodermic syringe embodying the principles of my present invention, showing in connection therewith the hypodermic needle for making an injection. Fig. 2 is a longitudinal vertical section of the said syringe with the needle removed and showing the plunger or piston in elevation. Fig. 3 is a horizontal section taken on line 3 3 in said Fig. 1 looking in the direction of the arrow x. Fig. 4 is a perspective view of the combined holding device and finger-piece; and Fig. 5 is a similar view of a piston-guide employed with the syringe, both the said parts being shown detached from the cylinder or barrel of the syringe.

Similar characters of reference are employed in the above-described views to indicate corresponding parts.

Referring now to the said drawings, the reference character 1 indicates the complete syringe, the same comprising a suitable cylinder or barrel 2, preferably of glass, having a reduced outlet end 3, to which may be attached in any suitable manner a hypodermic needle, as 4. The said cylinder or barrel 2 is also made with an open end 5, surrounded by an outer marginal bead or shoulder 6, substantially as shown. This marginal bead or shoulder 6 is made in its opposite sides with suitable receiving-recesses or cut-away parts or depressions 7, having their inner faces tapering or inclining in inner directions, as at 8 (see Fig. 2 of the drawings,) toward the main and outer cylindrical surface of the cylinder or barrel 2. Within the said cylinder or barrel 2 is movably arranged a suitable plunger or piston 9, having a rod or stem 10, which projects from the open end 5 of the said cylinder or barrel 2, and is provided with a finger piece or knob 11 above the said open end 5, as clearly illustrated.

Suitably disposed upon the upper marginal edge of the cylinder or barrel 2 which surrounds the said opening 5 is a plate or disk 12, made from suitable spring metal, said plate or disk being formed with a radial opening 13, extending from one side of the marginal edge of the said plate or disk and terminating at the middle of the said plate or disk, thus providing a sufficient guide means for the rod or stem 10 of the piston or plunger 9. That the said plate or disk 12 will be operatively retained in its separable relation with the upper edge of the said open part of the cylinder or barrel 2, the said disk or plate is made at its opposite edges with downwardly and inwardly projecting spring-like holding or clamping members 14, adapted to be sprung or forced into and arranged in holding engagement with the correspondingly-inclined faces 8 of the said recesses or cut-away parts 7 in the marginal bead or shoulder 6 to prevent accidental upward withdrawal or displacement, as will be presently more fully described. Each holding or clamping member 14 is also made with an outwardly-extending spring-like holding portion 15, and each holding portion 15 is provided with an inwardly-bent receiving end 16, as clearly illustrated in Figs. 2 and 5 of the drawings. That the said guide plate or disk 12 may be firmly secured in its operative position upon the upper open portion 5 of the cylinder or barrel 2 by means of the said spring-like holding or clamping members 14 and to provide a suitable holding device for securely retaining the syringe between the fingers of the operator when in use, I have provided a holding device represented in the several figures of the drawings and more especially in Fig. 4. This device consists, essentially, of a ring-shaped body 17, formed with an opening 18, having oppositely-arranged receiving-depressions or cut-away portions 19, each recess being made with its inner face tapering in an outward direction, so as to correspond to the outwardly-extending spring-like holding portions 15, the said receiving-depressions or cut-away portions 19 being so made that they can be entered upon and over the inwardly-bent receiving ends 16 and then forced into a firm holding or binding engagement with the said holding or clamping portions 15, as clearly illustrated. When these parts have in this manner been assembled upon the upper portion of the cylinder or barrel 2, the various holding or clamping portions of the disk or plate 12 will tightly hug the opposite side portions of the cylinder or barrel 2 with the upper surface of the ring-shaped body 17 of the holding device securely arranged against the under edge of the bead or shoulder 7 of the cylinder or barrel, as clearly illustrated in Fig. 5 of the drawings. The said holding device is also provided with oppositely-extending finger-pieces 20, preferably provided with the lower concaved surfaces 21 for the arrangement therein of the fingers of the operator. It will thus be seen that the parts are all retained in their operative positions, and the pressure upon the syringe, no matter how great, will not force the holding device from the end of the cylinder or barrel 2, and the finger-pieces 20 of the said device being sufficiently long they provide a good and positive seat for the fingers, and being made of metal they are not so likely to break away.

When it is desired to remove the plunger or piston 9 from the cylinder or barrel 2, the said holding device is readily and quickly forced in a downward direction along the cylindrical body of the cylinder or barrel 2, and thereby disengaged from the holding members of the disk or plate 12. This disk or plate can then be readily sprung from its held position over the open part 5 of the cylinder or barrel, thus permitting the withdrawal of the plunger or piston for cleaning the latter and the other parts of the syringe. After cleaning the various parts they can then again be assembled in their operative positions in the manner just described and as clearly illustrated in the accompanying drawings.

From the foregoing description of my invention it will be seen that I have devised a simple and efficient syringe construction the parts of which can be quickly separated and then again easily assembled to provide an operative device, and, furthermore, I have produced a syringe for hypodermic injections or for other purposes which can be easily held and guided between the fingers of the operator without the least danger of distorting the centered position of the hypodermic needle in the body of the patient, and all possibility of

the breaking off of the needle and the breaking of the glass stem of the plunger or piston is clearly avoided.

I am aware that some changes may be made in the arrangements and combinations of the various parts without departing from the scope of this invention. Hence I do not limit this invention to the exact arrangements and combinations of the parts as described in the foregoing specification and as illustrated in the accompanying drawings, nor do I confine myself to the exact details of the construction of the said parts.

Having thus described my invention, what I claim is—

1. As a new article of manufacture, a syringe comprising a cylinder having an outlet end and an open upper end, a plunger in said cylinder, a stem on said plunger extending from the open end of the cylinder, a guide-plate arranged over said open end, said guide-plate being provided with spring-like holding members embracing the opposite sides of the cylinder, and holding means on said cylinder in separable holding engagement with said holding members of the guide-plate, substantially as and for the purposes set forth.

2. As a new article of manufacture, a syringe comprising a cylinder having an outlet end and an open upper end, a plunger in said cylinder, a stem on said plunger extending from the open end of the cylinder, a guide-plate arranged over said open end, said guide-plate being provided with spring-like holding members embracing the opposite sides of the cylinder, and a holding device on said cylinder comprising a ring-shaped body adapted to be forced in holding engagement with said holding members of the guide-plate, and finger-pieces connected with said ring-shaped body, substantially as and for the purposes set forth.

3. As a new article of manufacture, a syringe comprising a cylinder having an outlet end and an open upper end, a marginal bead surrounding the said open upper end, said bead being provided with oppositely-located receiving-depressions, a plunger in said cylinder, a stem on said plunger extending from the open end of the cylinder, a guide-plate arranged over said open end, said guide-plate having spring-like holding members arranged in said receiving-depressions of the marginal bead, and means on said cylinder in separable holding engagement with the holding members of said guide-plate, substantially as and for the purposes set forth.

4. As a new article of manufacture, a syringe comprising a cylinder having an outlet end and an open upper end, a marginal bead surrounding the said open end, said bead being provided with oppositely-located receiving-depressions, a plunger in said cylinder, a stem on said plunger extending from the open end of the cylinder, a guide-plate arranged over said open end, said guide-plate having spring-like holding members arranged in said receiving-depressions of the marginal bead, and a holding device on said cylinder comprising a ring-shaped body adapted to be forced in holding engagement with the holding members of said guide-plate, and finger-pieces connected with said ring-shaped body, substantially as and for the purposes set forth.

5. As a new article of manufacture, a syringe comprising a cylinder having an outlet end and an open upper end, a marginal bead surrounding the said open upper end, said bead being provided with oppositely-located receiving-depressions, each depression having an inwardly-tapering face, a plunger in said cylinder, a stem on said plunger extending from the open end of the cylinder, a guide-plate arranged over said open end, said guide-plate having inwardly-extending holding members adapted to be arranged in holding engagement with the tapering faces of the receiving-depressions of said bead, engaging portions extending from said inwardly-extending holding members of said guide-plate, and means on said cylinder for separable holding engagement with the said engaging portions which extend from said inwardly-extending holding members of the guide-plate, substantially as and for the purposes set forth.

6. As a new article of manufacture, a syringe comprising a cylinder having an outlet end and an upper open end, a marginal bead surrounding the said open upper end, said bead being provided with oppositely-located receiving-depressions, each depression having an inwardly-tapering face, a plunger in said cylinder, a stem on said plunger extending from the open end of the cylinder, a guide-plate arranged over said open end, said guide-plate having inwardly-extending holding members adapted to be arranged in holding engagement with the tapering faces of the receiving-depressions of said bead, engaging portions extending from said inwardly-extending holding members of said guide-plate, and a holding device on said cylinder comprising a ring-shaped body adapted to be forced in holding engagement with the said engaging portions which extend from said inwardly-extending holding member, and finger-pieces connected with said ring-shaped body, substantially as and for the purposes set forth.

7. As a new article of manufacture, a syringe comprising a cylinder having an outlet end and an open upper end, a marginal bead surrounding the said open upper end, said bead being provided with oppositely-located receiving-depressions, each depression having an inwardly-tapering face, a plunger in said cylinder, a stem on said plunger extending from the open end of the cylinder, a guide-plate arranged over said open end, said guide-plate having inwardly-extending holding members adapted to be arranged in holding

engagement with the tapering faces of the receiving-depressions of said bead, an outwardly-extending engaging or holding portion extending from each inwardly-extending holding member, and a receiving member connected with each outwardly-extending holding member, and a holding device on said cylinder comprising a ring-shaped body having oppositely-disposed receiving-depressions provided with outwardly-tapering faces adapted to be brought in separable holding engagement with said outwardly-extending holding portions of said guide-plate, and finger-pieces connected with said ring-shaped body, substantially as set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 19th day of October, 1904.

GUSTAVE REHMANN.

Witnesses:

FREDK. C. FRAENTZEL,

GEO. D. RICHARDS.