

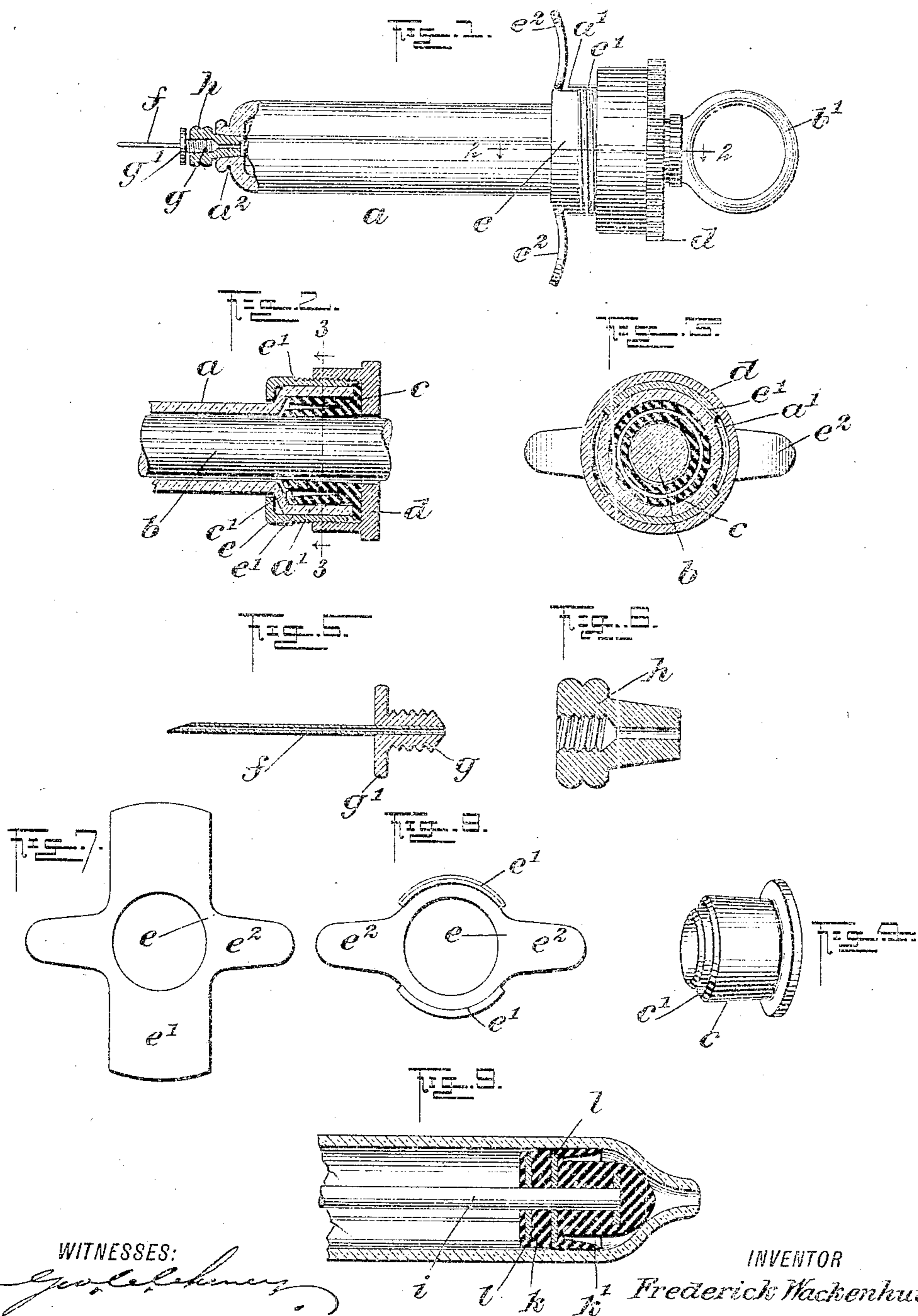
No. 786,697.

PATENTED APR. 4, 1905.

F. WACKENHUTH.

SYRINGE.

APPLICATION FILED DEC. 16, 1903



WITNESSES:

*George B. Owens*

*George B. Owens*

INVENTOR

*Frederick Wackenhuth*

BY

*Mumme*

ATTORNEYS

# UNITED STATES PATENT OFFICE.

FREDERICK WACKENHUTH, OF NEW YORK, N. Y.

## SYRINGE.

SPECIFICATION forming part of Letters Patent No 786,697, dated April 4, 1905.

Application filed December 16, 1903. Serial No. 185,386.

*To all whom it may concern:*

Be it known that I, FREDERICK WACKENHUTH, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Syringe, of which the following is a full, clear, and exact description.

This invention relates especially to hypodermic syringes, although certain features of my invention could be readily applied to syringes of other types.

The invention lies in certain improvements in the form and construction of the syringe, all of which will be fully brought out hereinafter.

This specification is an exact description of one example of my invention, while the claims define the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of a syringe with parts broken away. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a section on the line 3 3 of Fig. 2. Fig. 4 is a detail perspective view of the combined packing and gland. Fig. 5 is a detail section of the hypodermic needle. Fig. 6 is a section of the bushing employed in connection with the needle. Fig. 7 is a plan view of the blank for the finger-piece. Fig. 8 is a plan view of the finger-piece, and Fig. 9 is a detail view of a modification in the piston.

Referring to Figs. 1 to 3, the cylinder *a* is of glass and has at one end an integral stuffing-box *a'* and at the other end a nipple *a''*, which is provided interiorly with a tapered bore ground true by suitable devices, for a purpose which will hereinafter appear. *b* indicates a glass plunger-rod or piston having at its outer end a ring *b'* for facilitating its operation. The interior surfaces of the cylinder *a* and the sides of the plunger-rod *b* are ground to approximately an accurate engagement; but this engagement is not hermetic, my invention involving means for effecting a hermetic connection between the cylinder and piston at the outer end thereof, and thus avoid-

ing the expense and difficulty of grinding the piston and cylinder mathematically true, as has heretofore been done with a certain class of syringes well known on the market. These devices comprise a combined packing and gland *c*, formed of soft rubber and comprising an outer flange lying against the outer end of the stuffing-box *a'* and an inner cylindrical part encircling the rod *b*. Said inner cylindrical part forms the packing proper and is provided with an annular slit *c'*, which communicates with the interior of the cylinder. Now it is clear that when the pressure within the cylinder enters the said annular slit *c'* the packing is spread inward and outward, thus binding it against the sides of the piston-rod and also against the sides of the stuffing-box, whereby leakage both through and past the packing is prevented.

The combined gland and packing is held in place by means of a cap *d*, of metal, hard rubber, or any desired material, said cap fitting over the rod *b* and being internally threaded, as shown in Fig. 2. These threads of the cap *d* engage the curved tongues *e'*, carried on a collar *e*, having the finger-pieces *e''* projected therefrom between the tongues *e'*. Fig. 7 shows the blank from which the parts *e*, *e'*, and *e''* are made. This blank is stamped or otherwise produced from a single sheet of metal, after which the tongues *e'* are bent up and curved in the arc of a circle corresponding with the cap *d* and externally threaded. The collar is then drawn over the cylinder and bears against the shoulder formed by the stuffing-box *a'*, all of the parts being drawn snugly together by the action of the cap and the tongues *e'*, as will be understood.

*f* indicates the hypodermic needle, to which a sleeve *g*, preferably of brass, is soldered or otherwise fastened, as shown, this sleeve encircling one end of the needle and being provided with externally-threaded ends. *g'* indicates a flange formed on the sleeve to facilitate turning the same. The threaded sleeve *g* is adapted to screw into a bushing *h*, which is fitted to the bore in the nipple *a''*. This bushing *h* is formed, preferably, of hard rubber, and when the parts *g* and *h* are engaged together, as shown, the bushing *h* is wedged

tightly within the nipple  $a^2$ , thus making a hermetic connection. Concerning this part of my invention, it will be observed that should the needle break at any time it is only  
 5 necessary to unscrew the sleeve  $g$  from the bushing  $h$  and apply a new needle. The bushing  $h$  may be removed at any time for the purpose of cleaning or packing the syringe and also to permit the introduction into the  
 10 cylinder of the syringe of the medicine to be injected.

A modified form of my invention shown in Fig. 9 comprehends the use of a metallic rod  $i$  and a piston  $k$  of soft rubber or its equivalent. This piston is preferably vulcanized on  
 15 pins or flanges  $l$ , attached to the rod  $i$ , and said piston has an annular slit  $k'$  therein, forming a flexible annular lip, which under the fluid-pressure within the cylinder is forced  
 20 out against the inner walls of the cylinder, and thus a hermetic connection between the two is effected.

Various changes in the form, proportions, and minor details of my invention may be re-  
 25 sorted to at will without departing from the spirit and scope thereof. Hence I consider myself entitled to all such variations as may lie within the intent of my claims.

Having thus described my invention, I claim  
 30 as new and desire to secure by Letters Patent—

1. In a syringe, a soft-rubber member co-acting with the cylinder and rod, and having an annular slit therein forming an annular flexible lip adapted to be forced out by the fluid-  
 35 pressure within the syringe.

2. In a syringe, a packing ring or sleeve formed of soft rubber or its equivalent, and having an annular slit therein producing two annular lips adapted to be spread apart by the  
 40 fluid-pressure within the cylinder so as to bear hermetically against both the rod and cylinder.

3. A syringe, having a finger-piece comprising a ring, a finger-piece proper, two separate longitudinally-projected lips, and a cap  
 45 having connection with the lips.

4. A syringe, having a finger-piece comprising a ring, a finger-piece proper, and two separate oppositely-situated longitudinally-

extending lips having threads thereon, and a cap having threaded engagement with the said  
 50 lips.

5. A syringe having a cylinder, a rod working through one end thereof, a packing acting between the cylinder and rod at said end of the cylinder, said end of the cylinder being  
 55 enlarged to receive the packing, a cap serving to hold the packing in place, and a finger-piece engaged with the enlargement of the cylinder and connected with the cap to hold the cap in place.  
 60

6. A syringe having a cylinder provided with an enlargement forming a stuffing-box, a rod working through the enlargement, a packing in the enlargement, a finger-piece comprising a ring, a finger-piece proper and  
 65 a projecting lip, the said ring encircling the cylinder and engaging the enlargement and the lip extending longitudinally of the cylinder alongside of the enlargement, and a means for holding the packing in place.  
 70

7. A finger-piece for syringes comprising a ring, a finger-piece proper projecting therefrom, and two spaced lips projecting from the ring and adapted to extend alongside the syringe-cylinder longitudinally thereof.  
 75

8. A finger-piece for syringes comprising a ring, a finger-piece proper projecting therefrom, and two spaced lips projecting from the ring and adapted to extend alongside the syringe-cylinder longitudinally thereof, all of the  
 80 parts of the finger-piece being struck up from an integral plate of metal.

9. A syringe having a glass cylinder, a glass rod working therein and forming a plunger-piston, said parts having their opposing sur-  
 85 faces formed to approximately true contact, and a packing acting between the cylinder and rod to form a hermetic connection.

In testimony whereof I have signed my name to this specification in the presence of two sub-  
 90 scribing witnesses.

FREDERICK WACKENHUTH.

Witnesses:

ISAAC B. OWENS,  
 JNO. M. BITTER.