

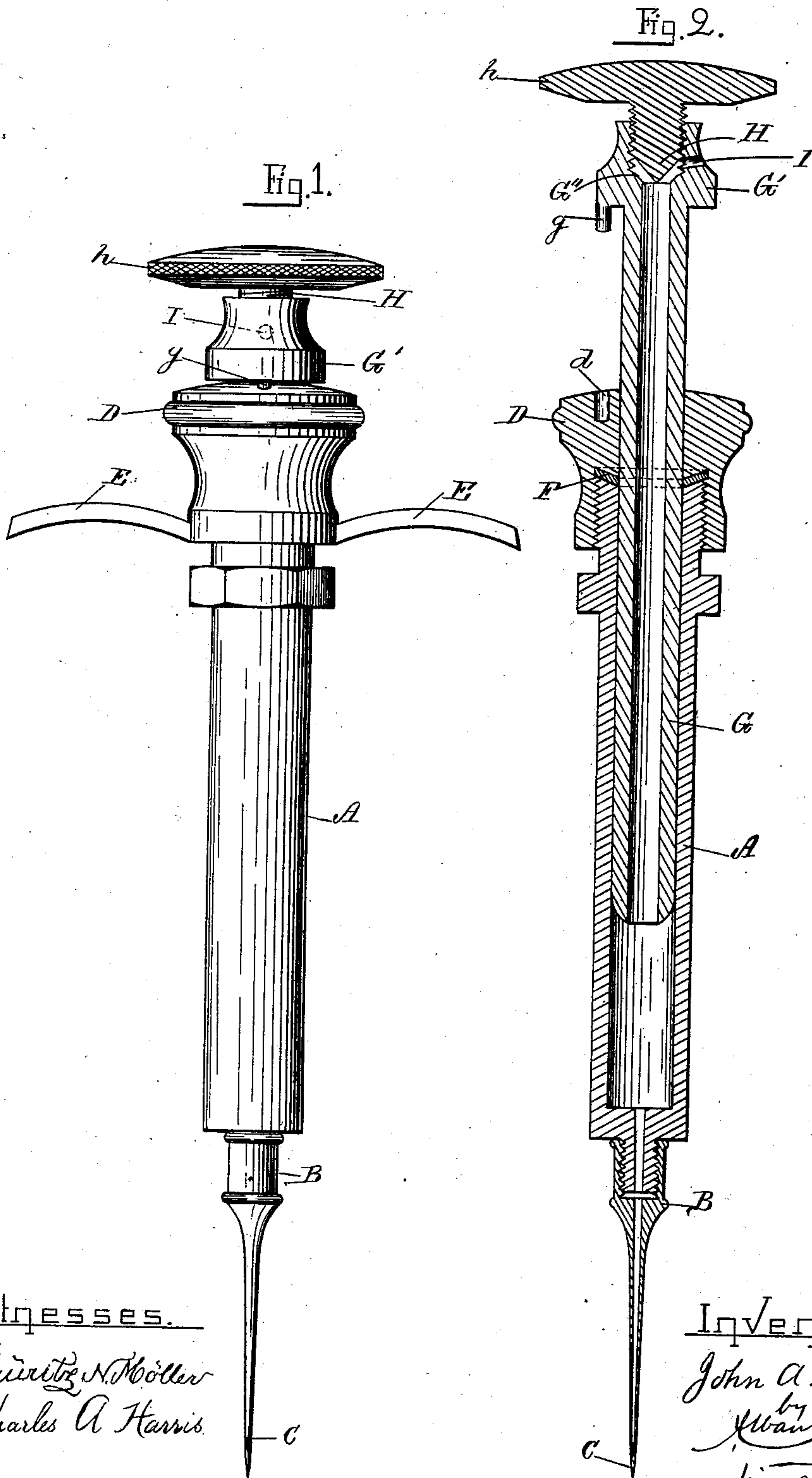
No. 701,671.

Patented June 3, 1902.

J. A. BILLINGS.  
HYPODERMIC SYRINGE.

(Application filed Aug. 3, 1901.)

(No Model.)



Witnesses.

*Lauritz N. Möller*  
*Charles A. Harris*

Inventor.

*John A. Billings.*  
*by Elwan Andren*  
*his atty.*

# UNITED STATES PATENT OFFICE.

JOHN A. BILLINGS, OF ROCKLAND, MASSACHUSETTS.

## HYPODERMIC SYRINGE.

SPECIFICATION forming part of Letters Patent No. 701,671, dated June 3, 1902.

Application filed August 3, 1901. Serial No. 70,706. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN A. BILLINGS, a citizen of the United States, residing at Rockland, in the county of Plymouth and State of Massachusetts, have invented new and useful Improvements in Hypodermic Syringes, of which the following is a specification.

This invention relates to an improved hypodermic syringe; and it has for its object to prevent any portion of the fluid in the needle from being drawn back into the syringe when the plunger or piston is being withdrawn previous to refilling the syringe, as will hereinafter be more fully shown and described, reference being had to the accompanying drawings, wherein—

Figure 1 represents an enlarged side elevation of my improved hypodermic syringe, showing the plunger or piston forced inward during the injection of the liquid; and Fig. 2 represents a central longitudinal section of Fig. 1, showing the plunger or piston partially moved outward relative to the cylinder.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

In the drawings, A represents the cylinder of a hypodermic syringe, as usual, to the lower end of which is secured a longitudinally-perforated shank B, terminating in a perforated needle-point C, as is common in devices of this kind. To the opposite end of the cylinder A is detachably secured a screw-threaded cap D, provided with finger-guards E E, as usual.

F is a suitable packing interposed between the end of the cylinder A and inner portion of the cap D, as usual.

Within the cylinder A is arranged a reciprocatory hollow plunger or piston G, having a head G' on its outer end, as shown, and said head is provided with a projection or pin *g*, adapted to interlock with a notch or recess *d* in the cap D when the piston or plunger is forced inward relative to the cylinder A, as shown in Fig. 1.

Within the head G' is a valve-seat G'', which is normally closed by means of a screw-threaded valve H, which is screwed into a screw-threaded recess in the end of the head G' and is provided on its outer end with a preferably serrated head or knob *h*, by means

of which said valve may be turned to and from its seat.

I is a side perforation or vent in the head G', leading from the outside to a space above the valve-seat G'' in the hollow plunger G, as shown in Fig. 2, and said vent serves for the admission of the outer air to the interior of the hollow piston or plunger G and cylinder A when the plunger or piston is withdrawn from the cylinder for the purpose of refilling said cylinder, thereby preventing any of the fluid which may be in the needle from being drawn back into the syringe. Previous to such withdrawal of the plunger the valve H is screwed away from its seat G'', as shown in Fig. 2, thus preventing the liquid from being drawn back through the needle when the plunger is being withdrawn.

In using the device the solution of morphia or other liquid employed is introduced into the cylinder A preferably by first withdrawing the hollow piston G from said cylinder and pouring the liquid into the latter. The plunger G is then inserted into the said cylinder, after which the end of the needle C is inserted below the skin where the liquid is to be injected, as usual. The plunger G, its valve H being closed, is then moved inward in the cylinder, causing the liquid to be forced through the needle-point. During such expulsion of the liquid and when the plunger G reaches the limit of its inward stroke the head G' is prevented from being turned relative to the cap D by reason of the pin *g* entering the notch *d*, and while in this position the knob *h* is turned sufficiently to cause the valve H to be moved from its seat G'', thus establishing an open communication from the hollow plunger G to the outer air through the now open valve H and vent I, thus allowing the plunger of the syringe to be withdrawn without causing any of the liquid from being drawn into the cylinder during such removal of the plunger. This is very essential, as in the use of the ordinary syringe, when the plunger is removed from the cylinder previous to refilling it, whatever liquid remains in the needle is drawn back into the cylinder, and should that liquid be in any way contaminated it is a source of infection when the syringe is again used. This danger is entirely obviated by this my device



having an adjustable valve and air-inlet arranged at the upper end of the plunger, by which means the outer air is admitted to the cylinder when the plunger is removed.

5 What I wish to secure by Letters Patent and claim is—

In a hypodermic syringe, the combination with the cylinder provided at one end with a hollow needle and at its other end with a re-  
10 movable screw-cap having a mortise in its outer side at one side of the center, of a hollow reciprocating plunger arranged in the cylinder and provided with an unobstructed opening at its inner end and a valve-seat in  
15 its outer end, a threaded valve arranged in the outer end of the plunger and arranged to seat against said valve-seat and close the hol-

low plunger, a lateral vent formed in the plunger in rear of said valve-seat and leading to the atmosphere whereby when the 20 valve is moved away from its seat the cylinder is placed in communication with the atmosphere, and a pin carried by the outer end of the plunger and arranged to enter said mortise and lock the plunger against rota- 25 tion when the latter is sheathed within the cylinder, substantially as described.

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

JOHN A. BILLINGS.

Witnesses:

ALBAN ANDRÉN,

LAURETZ N. MÖLLER.