

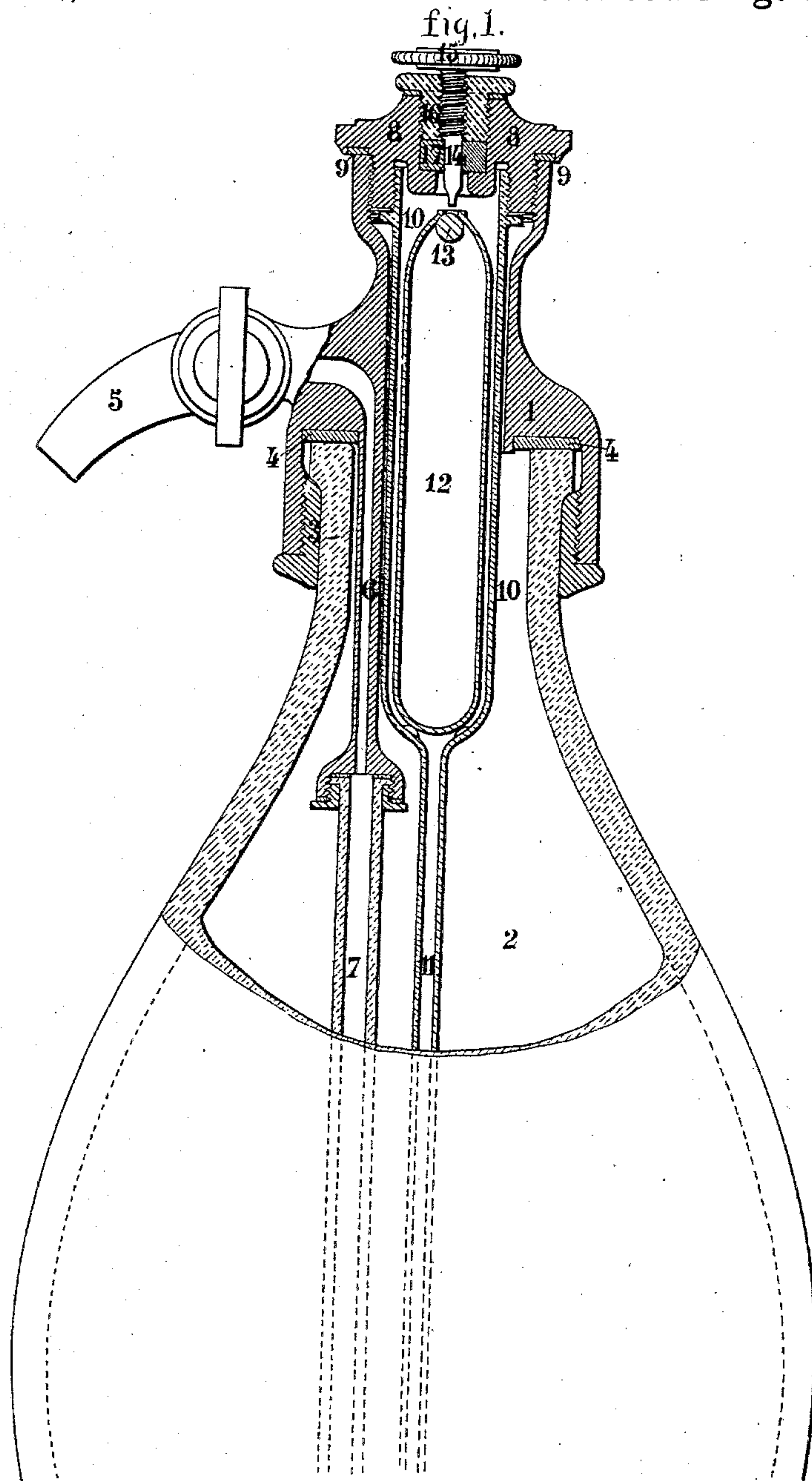
(No Model.)

4 Sheets—Sheet 1.

V. E. J. DURAFORT.
SELTZOGENE.

No. 545,351.

Patented Aug. 27, 1895.



Witnesses

Robert Smith.
James A. Green

Inventor

Victor Ernest Jules Durafort.
By

James L. Norrie.
Att'y.

(No Model.)

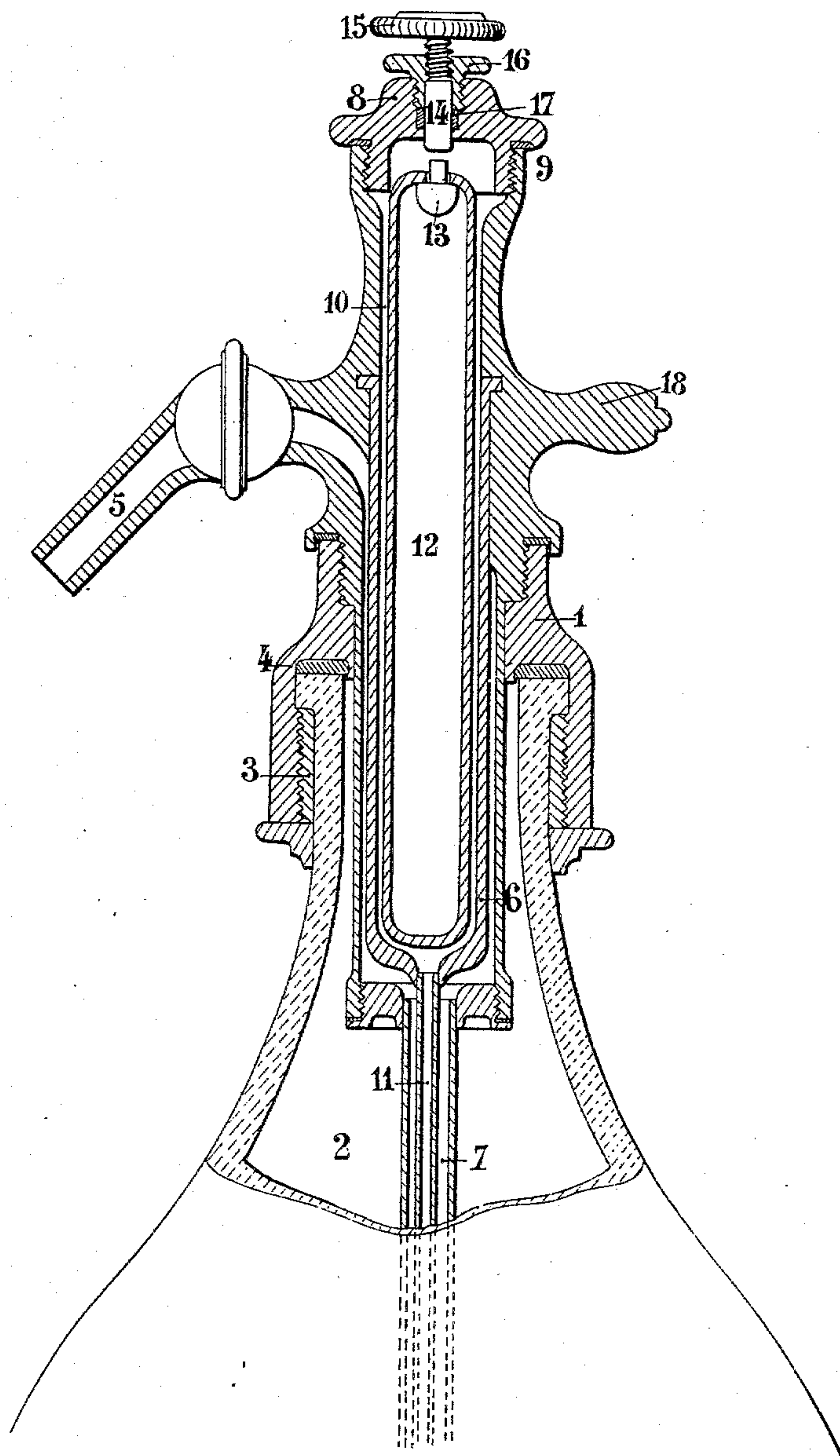
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V. E. J. DURAFORT.
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Patented Aug. 27, 1895.

fig. 2



Witnesses

Inventor

Robert Emmett
Thos A. Green

Victor Ernest Jules Durafort.
By *James L. Norrig.*
Atty.

(No Model.)

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V. E. J. DURAFORT.
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fig. 3

fig. 4

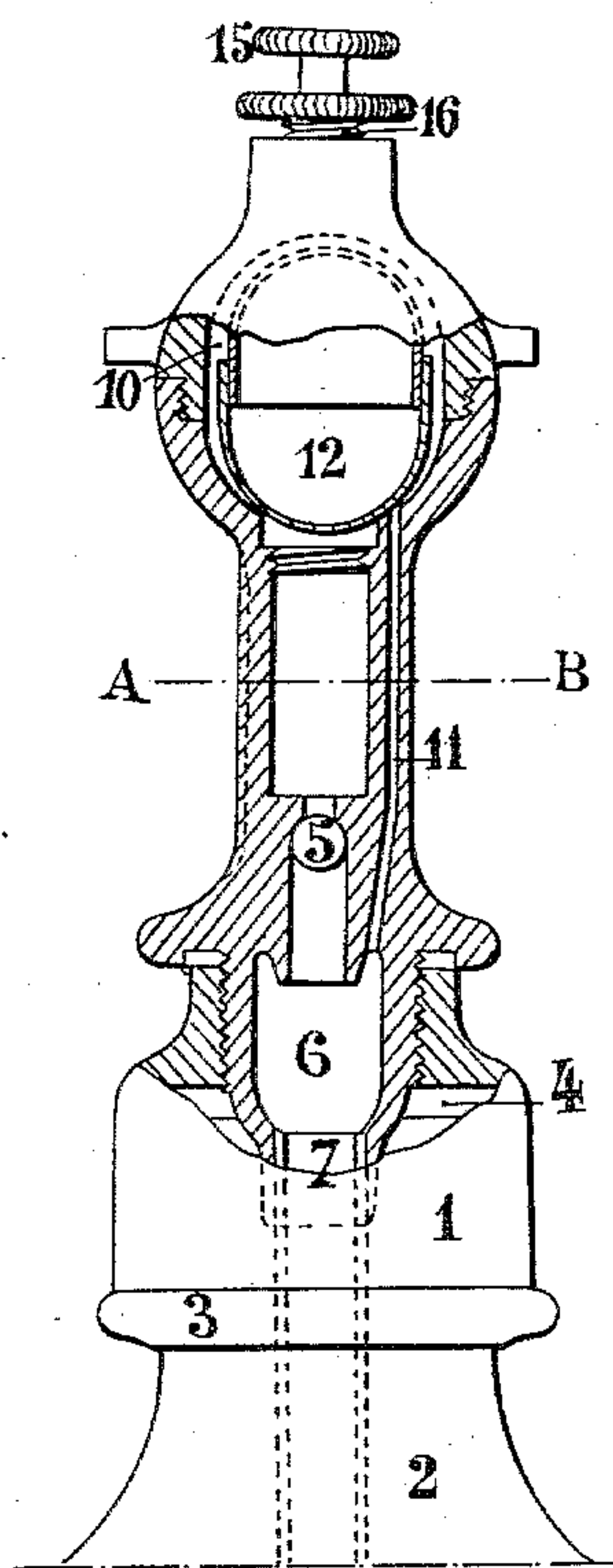
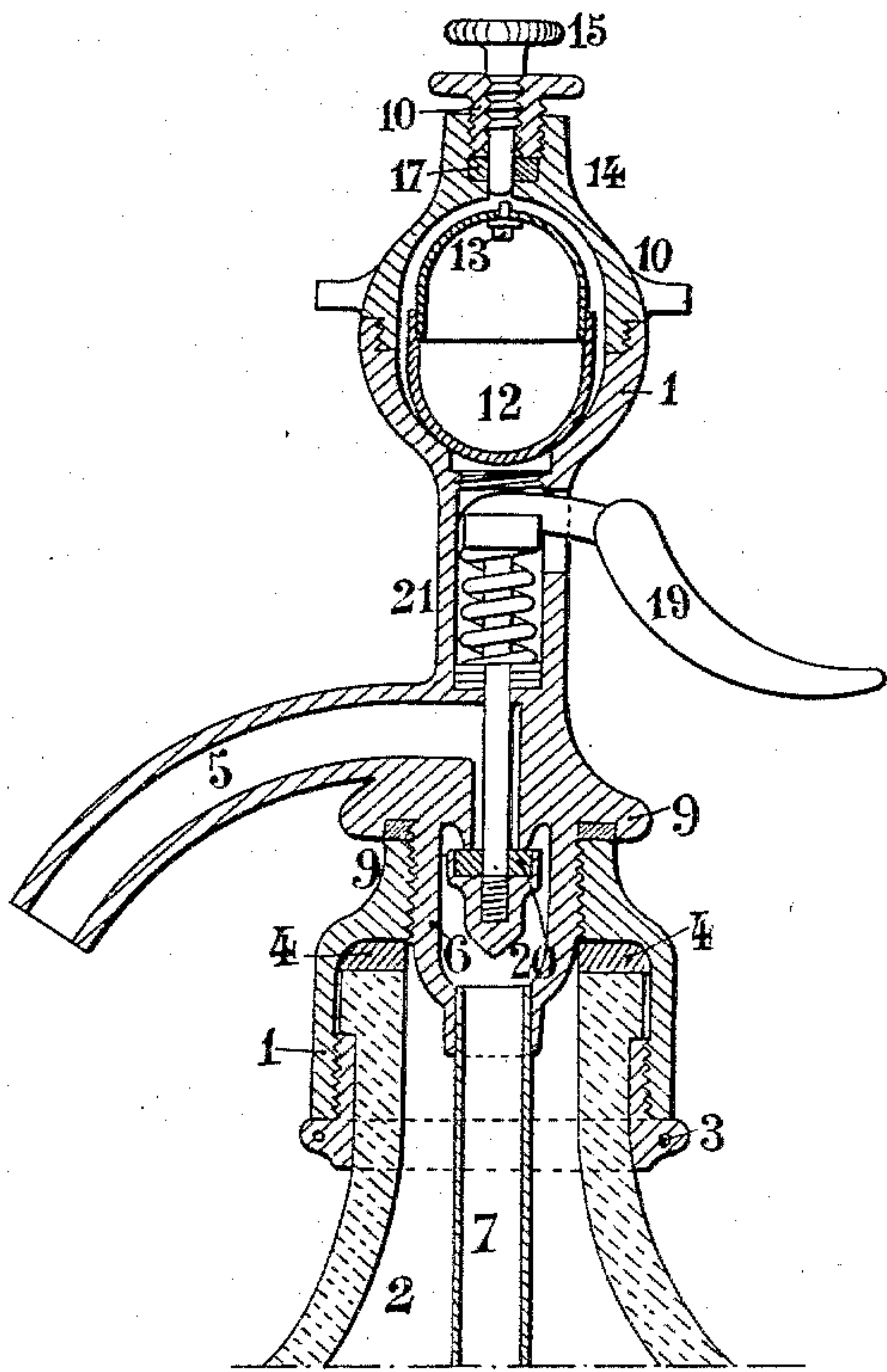
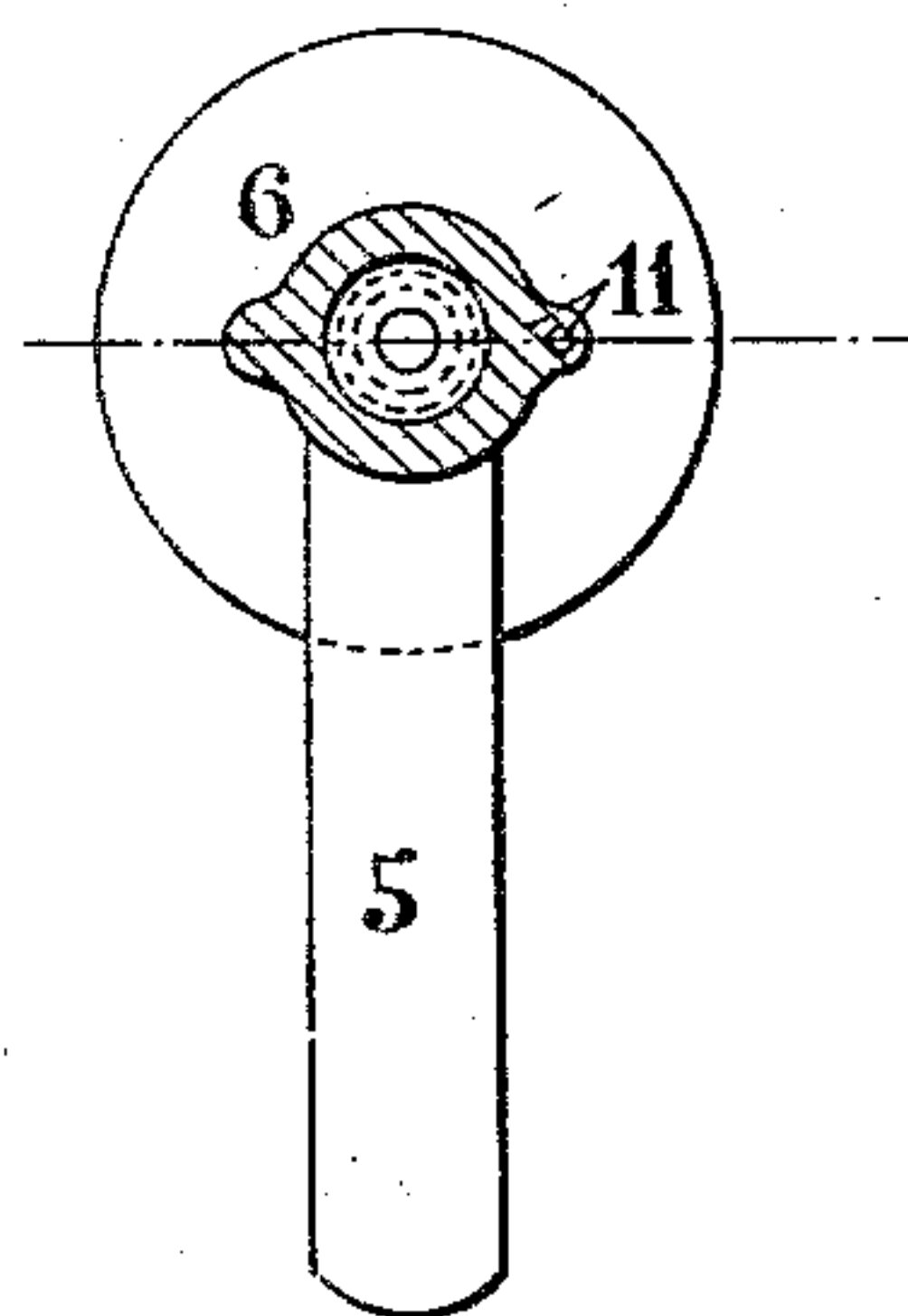


fig. 5



Witnesses

Robert Emmett
Thos. A. Green

Inventor

Victor Ernest Jules Durafort.
By *James L. Norris.*
Atty.

(No Model.)

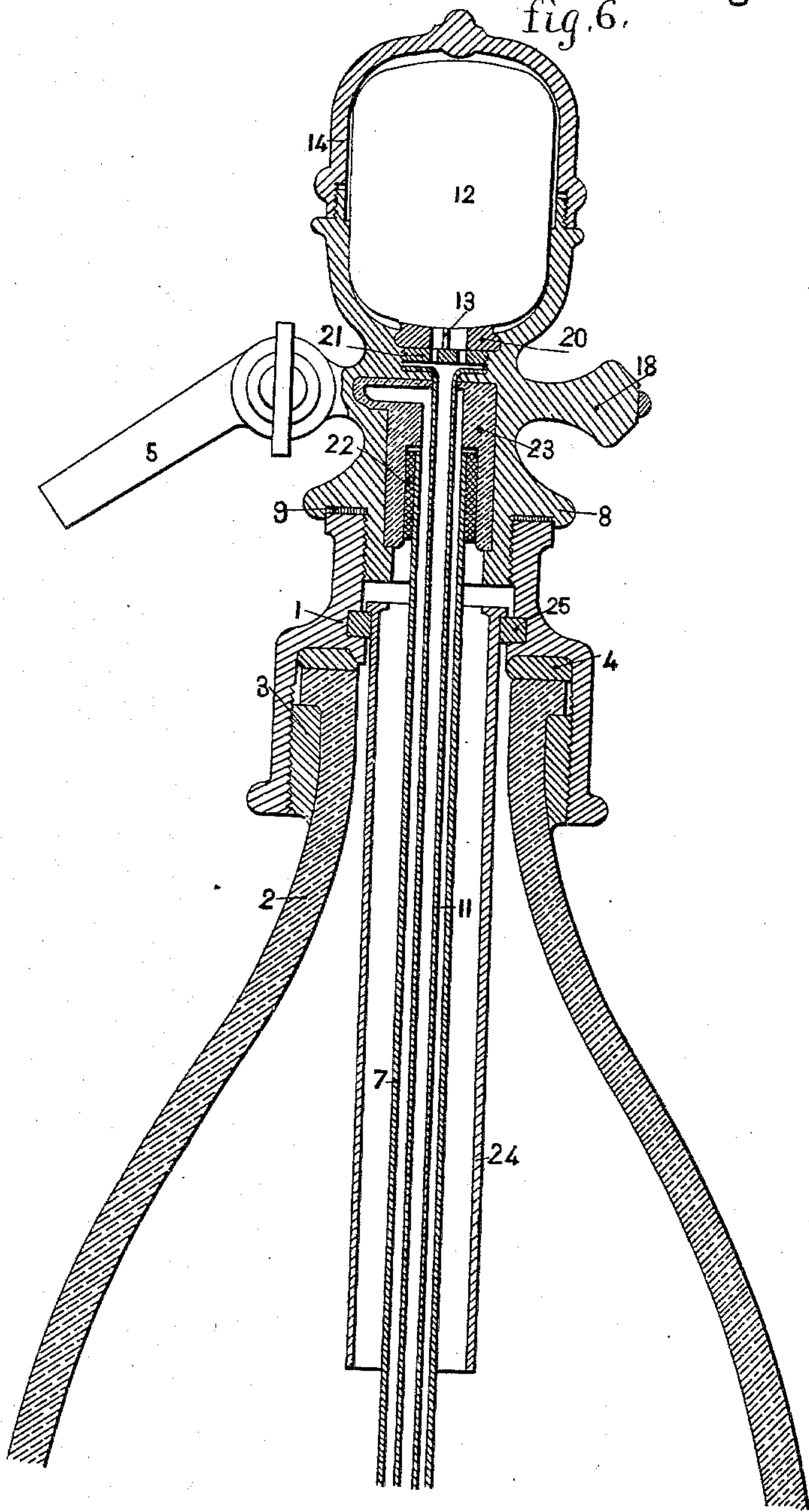
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fig. 6.



Witnesses

Robert Everett
Thos. A. Green

Inventor

Victor Ernest Jules Durafort.
By *James L. Noring.*
Atty.

UNITED STATES PATENT OFFICE.

VICTOR ERNEST JULES DURAFORT, OF PARIS, FRANCE.

SELTZOGENE.

SPECIFICATION forming part of Letters Patent No. 545,351, dated August 27, 1895.

Application filed February 19, 1895. Serial No. 538,993. (No model.) Patented in France August 22, 1892, No. 223,985, and in England January 10, 1893, No. 509.

To all whom it may concern:

Be it known that I, VICTOR ERNEST JULES DURAFORT, a citizen of France, and a resident of Paris, in the Department of the Seine, France, have invented a new and useful Improvement in Seltzogenes and Like Apparatus, (for which I have obtained Letters Patent in Great Britain, dated January 10, 1893, No. 509, and in France, dated August 22, 1892, No. 223,985,) of which the following is a specification.

This invention consists in apparatus enabling liquids contained in siphon-bottles and other like receptacles to be charged with carbonic-acid or other gas without the aid of special installations by means of small tubes or cartridges filled with compressed or liquefied carbonic-acid or other gas which is to be dissolved in the liquid to be gasified or aerated. The characteristic of the apparatus is the facility with which the small recipient or cartridge, when empty, can be replaced by a filled one.

According to this invention the head of the siphon-bottle or the like is provided with a metallic tube or chamber which is open at its upper end and may be prolonged at its lower end, so as to dip into the water or other liquid contained in the siphon, and into this tube or chamber the holder or cartridge containing the compressed or liquefied gas is placed, said holder or cartridge being of such a size as to leave a space between itself and the interior of the tube or chamber. The holder or cartridge consists of a strong tube furnished with a ball or other suitable valve, which is kept normally closed by the internal pressure of the compressed or liquefied gas contained in the said cartridge. This holder or cartridge is placed within the before-mentioned tube or chamber through an opening formed in the head of the siphon, which is hermetically closed by a screwed cover or stopper. Through this cover or stopper passes a headed screw which terminates just above the valve of the cartridge, so that by operating said screw the valve is opened and the compressed or liquefied gas is allowed to gradually escape from the cartridge and to enter the liquid in the siphon, and which liquid, when saturated with the gas, can be drawn off through a tube

communicating with the tap or cock of the siphon-bottle or the like. When the cartridge is empty, it is only necessary to unscrew the cover or stopper on the head of the siphon-bottle, then remove the cartridge, and insert a fresh one in its place; and in order that the invention may be readily understood, I will proceed to describe the same fully with reference to the annexed drawings, in which—

Figure 1 is an elevation with the upper part in vertical section, showing a flask or siphon-receptacle containing my invention. Fig. 2 is a similar view showing a slightly-modified construction. Figs. 3 and 4 are vertical sections showing the application of the invention to an ordinary siphon-head. Fig. 5 is a transverse section on the line A B in Fig. 4. Fig. 6 is a vertical section showing a modified form of the device illustrated in Fig. 2.

Referring to Fig. 1, the apparatus here shown in vertical section through its axis represents a siphon-head which is fixed upon the neck of a thick glass or other receptacle 2 by being screwed to an inner or fixed ring 3 3, formed in two parts and having a rubber washer 4 interposed to insure tightness. This is a usual mode of fixing, upon which the invention does not bear, but is only mentioned by way of example, as any other suitable means for the same purpose may be employed.

1 is the head of the siphon, which is provided with a tap or cock 5 for drawing off the gaseous liquid which has been forced by pressure into a tube 6, said tube being connected at its lower part to a glass tube 7. This arrangement is thus firmly secured to the siphon bottle or vessel 2, which is filled with liquid by unscrewing the screw-cap or stopper 8, which is furnished with an elastic washer 9. Into this cap or stopper is screwed a metal tube 10, terminating at bottom in a dip-tube 11. In the tube 10 is located the cartridge or gas-receptacle, sufficient space being left to allow free passage to the gas—for instance, compressed or liquefied carbonic-acid gas.

The cartridge consists of a strong metal tube 12, closed at its lower end and provided at its upper with a narrow orifice which is kept closed by a ball 13 or by any suitable valve

which is kept applied against its seat by the internal pressure. The closing of this cartridge is therefore the more air-tight as the pressure of the compressed or liquefied gas is the stronger.

Above the orifice of the tube 12 is arranged a screw-threaded rod 14, which can be raised or lowered by turning the milled button 15. The screwed portion of this rod traverses a nut 16, which compresses a rubber sleeve 17, through which the rod passes tight and easy. All issue is therefore closed to the gas, whatever may be the position of the rod.

This apparatus works as follows, it being supposed, for instance, to be applied to the manufacture of seltzer-water: The bottle being filled with water up to the height of the glass tube 11 and the receptacle 12 with liquid carbonic acid, the milled button 15 is turned in the required direction so as to cause the rod or valve 14 to descend. This latter slightly pushes down the ball 13 and allows the carbonic-acid gas, which fills the tube 10 as well as the tube 11, to escape gradually and to pass out through the lower orifice of this tube, so as to bubble up into the water, where it is immediately dissolved. The gas then escapes moderately from the cartridge wherein it is compressed, and without shock. In this way, by being able to regulate the escape of the gas, any danger which may arise from a too sudden opening of the cartridge is avoided. If needed, the siphon may be shaken to hasten the saturation, and it will be sufficient to gradually open the tap 5 to allow the gaseous liquid to flow out of the apparatus. When the apparatus is empty, it is quite easy to renew the operation. This can be effected by unscrewing the screw-cap or stopper 8, removing it, and also by unscrewing therefrom the tube 10, into which a fresh cartridge of compressed gas is introduced. This advantage of being able to readily remove and replace the cartridge is an essential feature of the invention, as it does not exist in other apparatus as heretofore constructed. To reduce the size and weight of the siphon-head, the apparatus may also be constructed as shown in Figs. 2 to 5, in which the same numerals of reference represent corresponding parts or perform the same office as those in Fig. 1.

Referring to Fig. 2, this shows, in vertical axial section, an apparatus which is only a variant in form of that previously described. By arranging the two tubes 11 and 7 concentrically, as shown in the said figure, a siphon-head is obtained which may be adapted to vessels having a smaller or narrow neck, while the height and the capacity of the liquid-carbonic-acid cartridge 12 may be increased, and hence its duration of service. The ball 13 (shown in Fig. 1) may also be replaced by a stem-valve designated by the same numeral as in Fig. 2. For convenience of transport of the siphons by hand, it is advantageous to cast a small handle 18 on the siphon-head.

The working of this apparatus is absolutely identical with that previously described. The gaseous carbonic acid which escapes from the cartridge fills the free space in the tube 10 and enters the water through the tube 11. When the tap 5 is opened, the liquid is forced out by the pressure in the annular space between the tubes 11 and 7 and flows out after having filled the space 6.

Referring to Figs. 3 to 5, these show, respectively, in vertical axial sections on perpendicular planes and in horizontal transverse section on the line A B of Fig. 4, apparatus of this system applied to an ordinary siphon-head. In this case the size of the liquid-carbonic-acid cartridge 12 is greatly reduced, so that without increasing excessively the size of the head the cartridge may be placed into the spherical space or cylindrospherical space 10. The gaseous carbonic acid, after having escaped from the cartridge through the small valve 13, enters the water in the siphon through the small passage 11 (formed in the metal of the head at the time of casting) and through the usual glass tube 7, which likewise allows passage to the gaseous water forced out by pressure when the lever 19 is depressed to remove the valve 20 from its seat, against which it is kept normally pressed by the coiled spring 21 and by the internal pressure of the gas. This apparatus is used in exactly the same manner as the preceding ones. When the liquid-carbonic-acid cartridge is empty, it is only necessary to unscrew the upper hemisphere of the chamber 10 to withdraw it and to insert a filled cartridge.

The apparatus shown in Fig. 6 is a modified form of the device illustrated by Fig. 2, from which, however, it is distinguished by the following features: The cartridge 12, containing the liquid carbonic acid, is wider and shorter and the stem-valve 13 is located at the bottom instead of being at the top of said cartridge, the opening of the valve 13 being effected by screwing the cap or stopper 14. The cartridge 12 rests upon an india-rubber washer 20. Across the path of the gaseous carbonic acid a wire-gauze or perforated plate 21 is provided, in order to slacken the escape of the gas. The pipe 11, through which the latter enters the water in the siphon-bottle, is made of aluminium, and the tube 7, through which the liquid is forced toward the tap or cock 5, is secured to the head of the siphon-bottle by means of an india-rubber sleeve 22, fitted into a porcelain or like inner coating, intended to avoid any contact of the gaseous liquid with the metal of the siphon-bottle head.

The apparatus shown in Fig. 6 is also provided with a "filling-in" tube 24, secured to the head of the siphon-bottle by means of an india-rubber washer 25. Through said tube the liquid to be saturated with gas is introduced and the filling in is automatically stopped as soon as the level of the liquid reaches the lower end of the tube 24, the length of which is such that the siphon-bottle cannot

be filled beyond about two-thirds of its height. It is thus insured that a sufficient capacity will remain for containing the gas above the liquid. Instead of the filling-in tube 24 a funnel of the same height could be employed. The other features and the working of this device are like those of the apparatus illustrated by Fig. 2.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I claim—

An apparatus for the direct saturation of liquids with gases, consisting of a siphon-head for a bottle, or receptacle, a cap, or stopper, to which is attached a tube having at its lower end a prolongation constituting a dip-tube, a

removable and replaceable cartridge, or receptacle, containing compressed or liquefied gas, inserted in the tube beneath the cap or stopper, the upper end of said cartridge having a ball held by pressure in an orifice in the upper end of the cartridge, and a screw-threaded rod tapped through the cap, or stopper, and adapted to unseat said ball by being screwed inward, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

VICTOR ERNEST JULES DURAFORT.

Witnesses:

CLYDE SHROPSHIRE,
N. JOUY.