

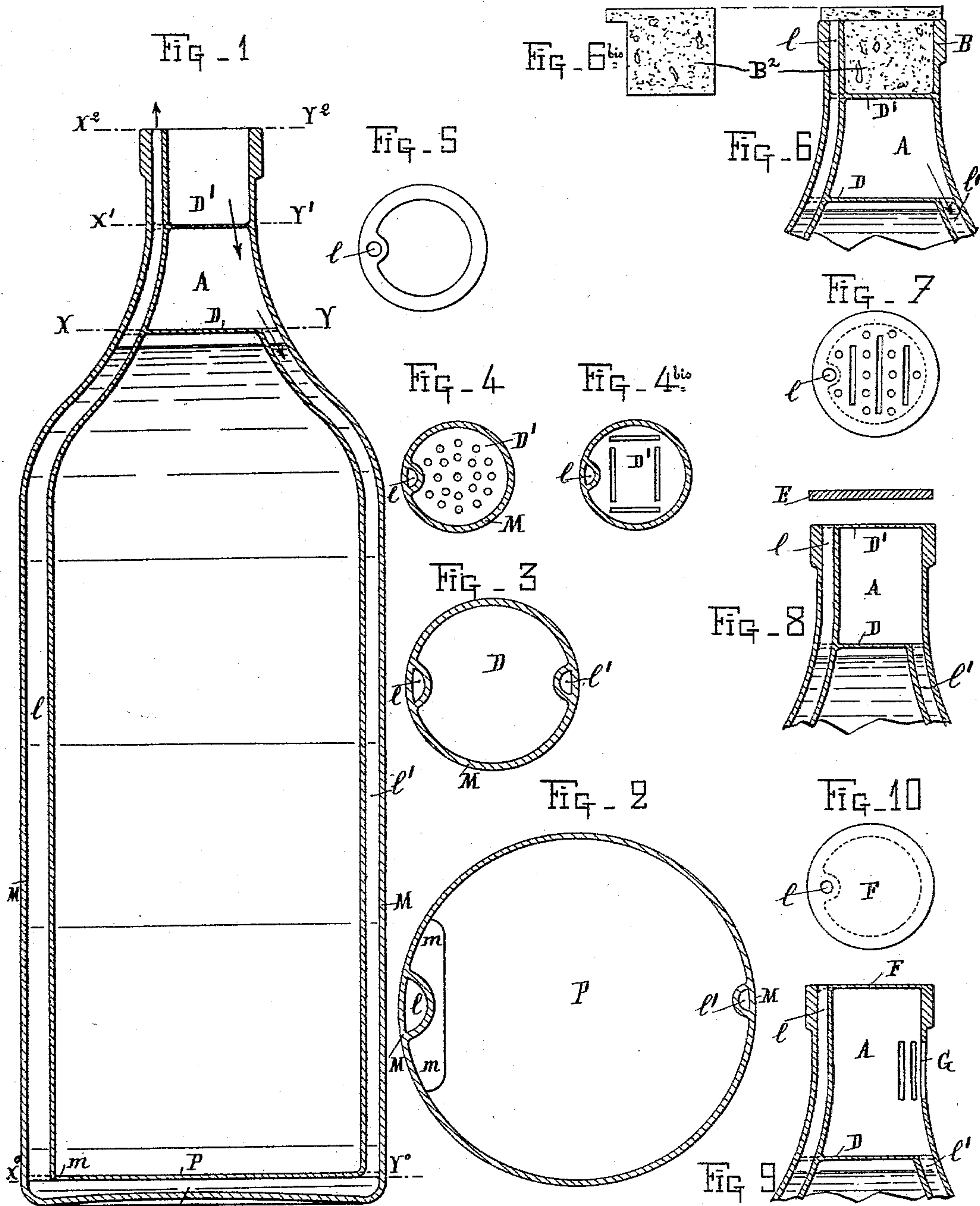
(No Model.)

3 Sheets—Sheet 1.

F. ROULAND.  
NON-REFILLABLE BOTTLE.

No. 598,117.

Patented Feb. 1, 1898.



Witnesses:  
W. H. Boulter  
L. H. Hill

Inventor:  
Francis Rouland  
By W. H. Boulter,  
attorney

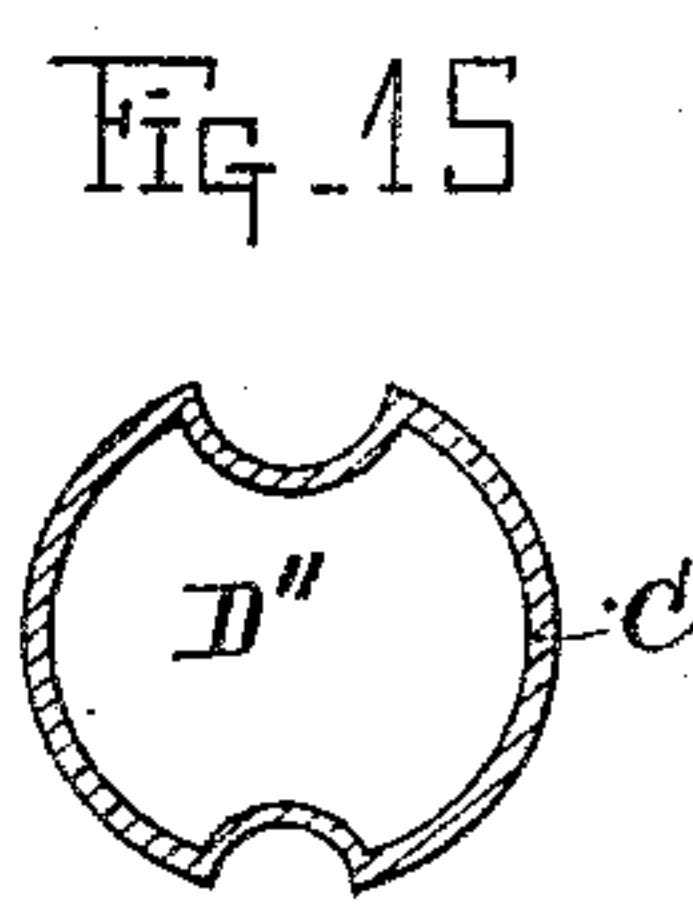
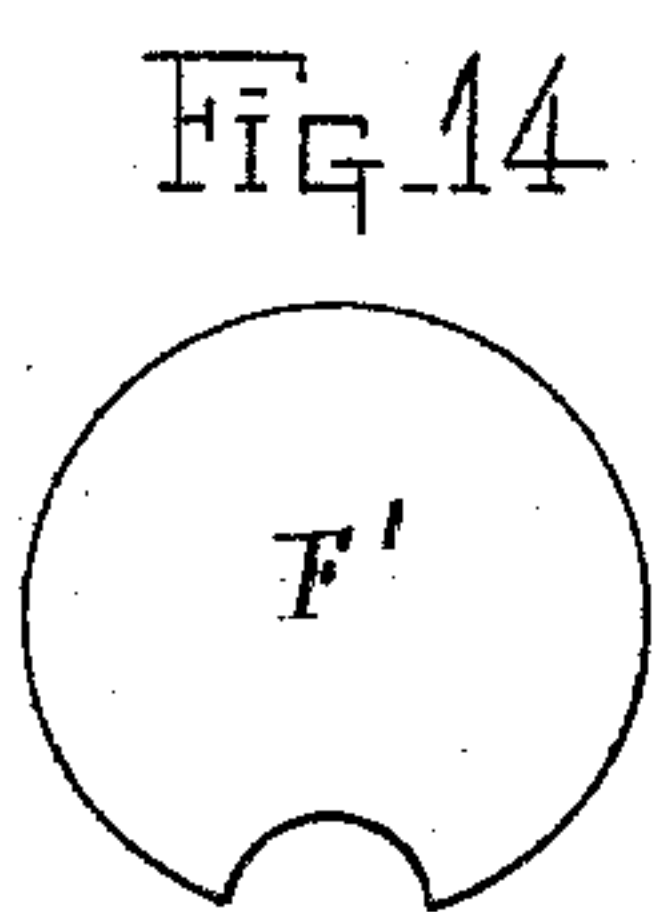
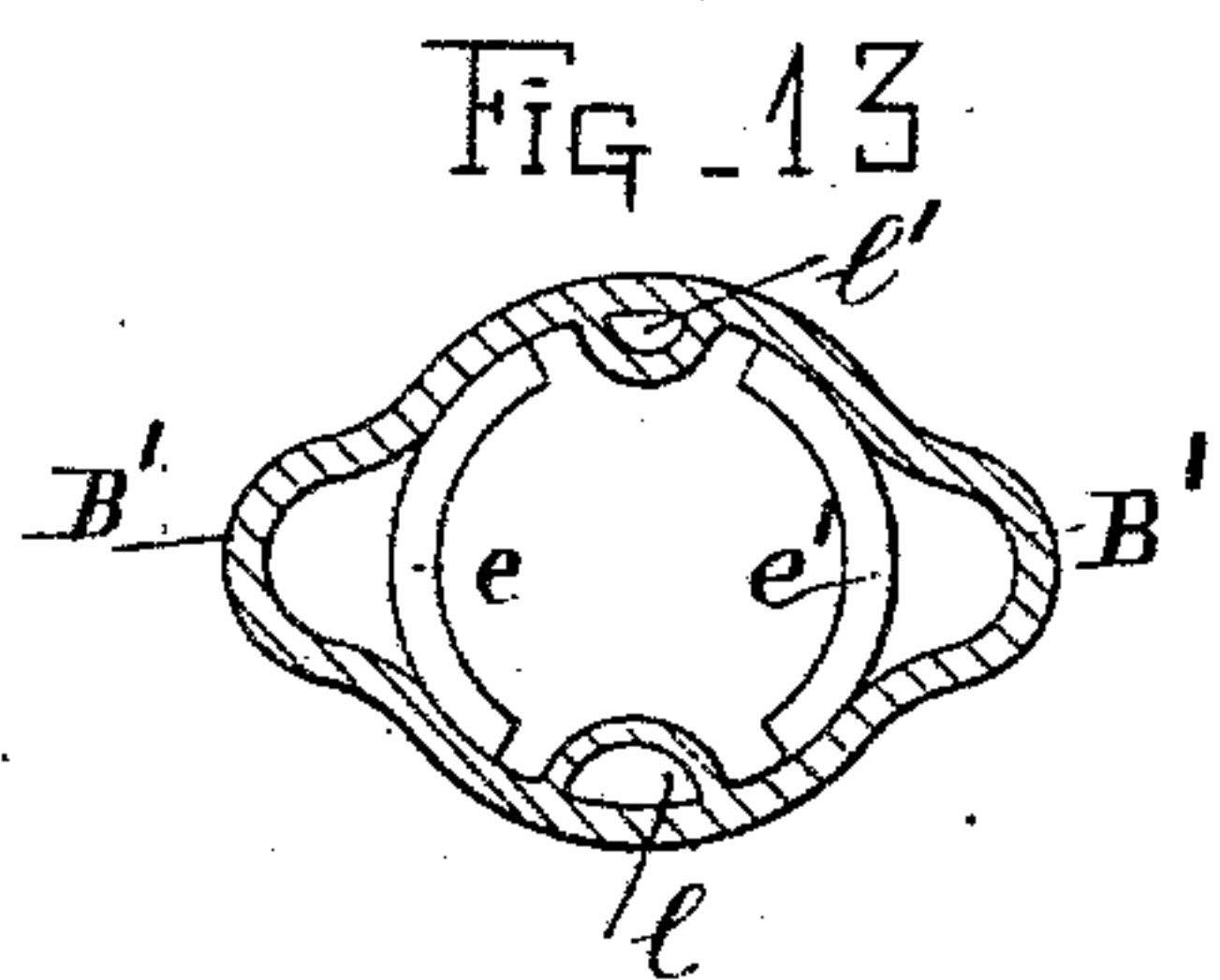
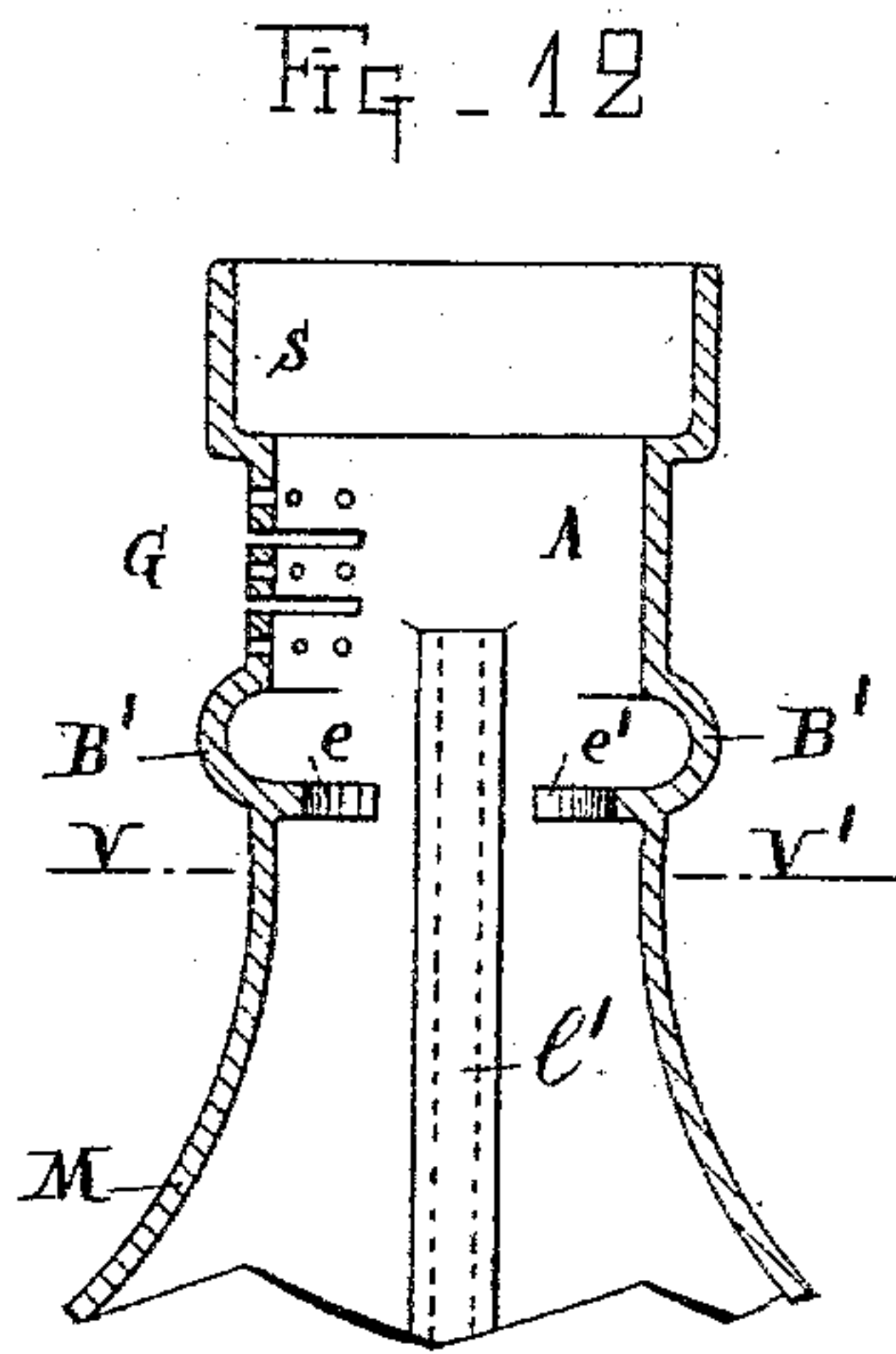
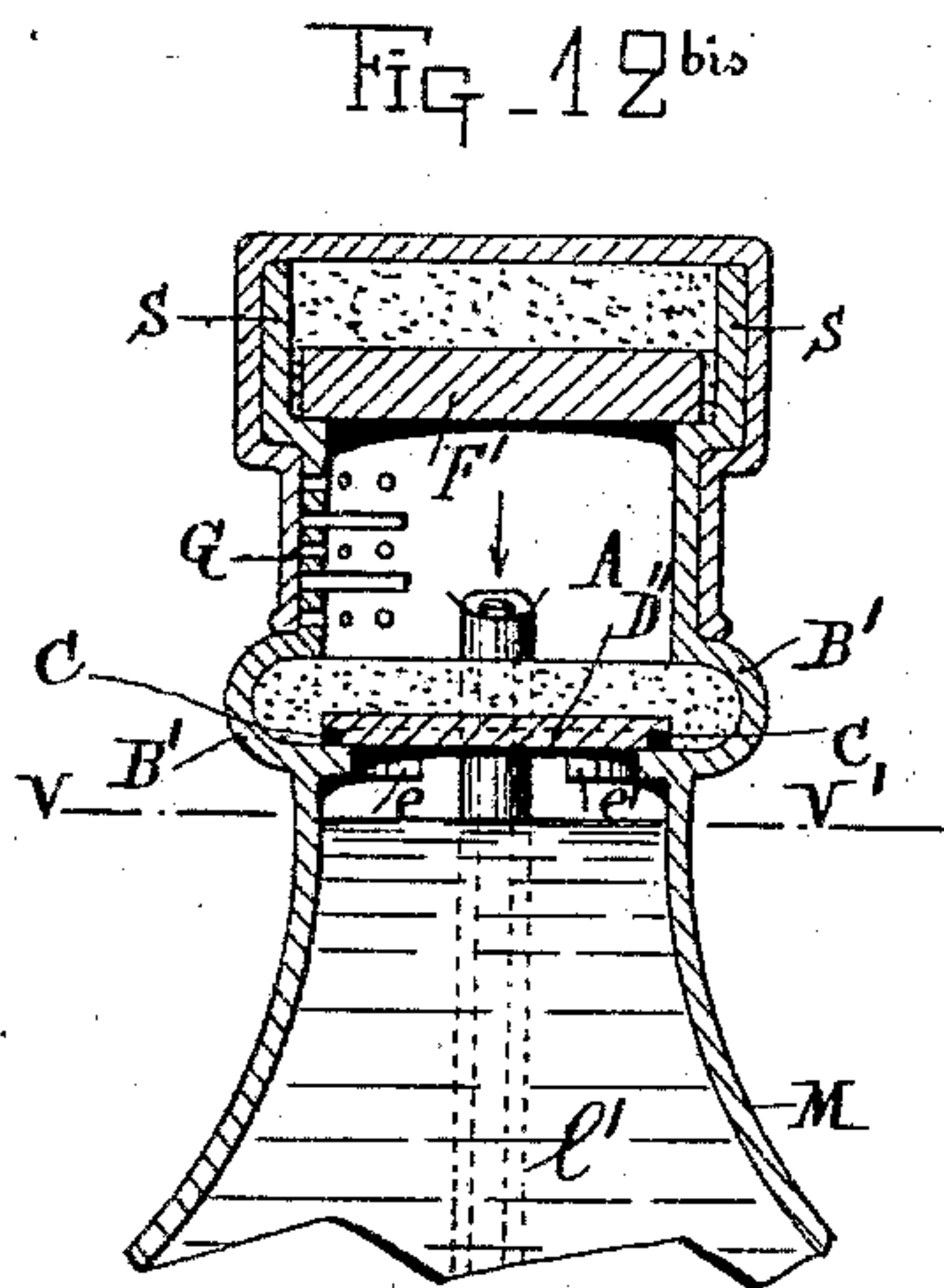
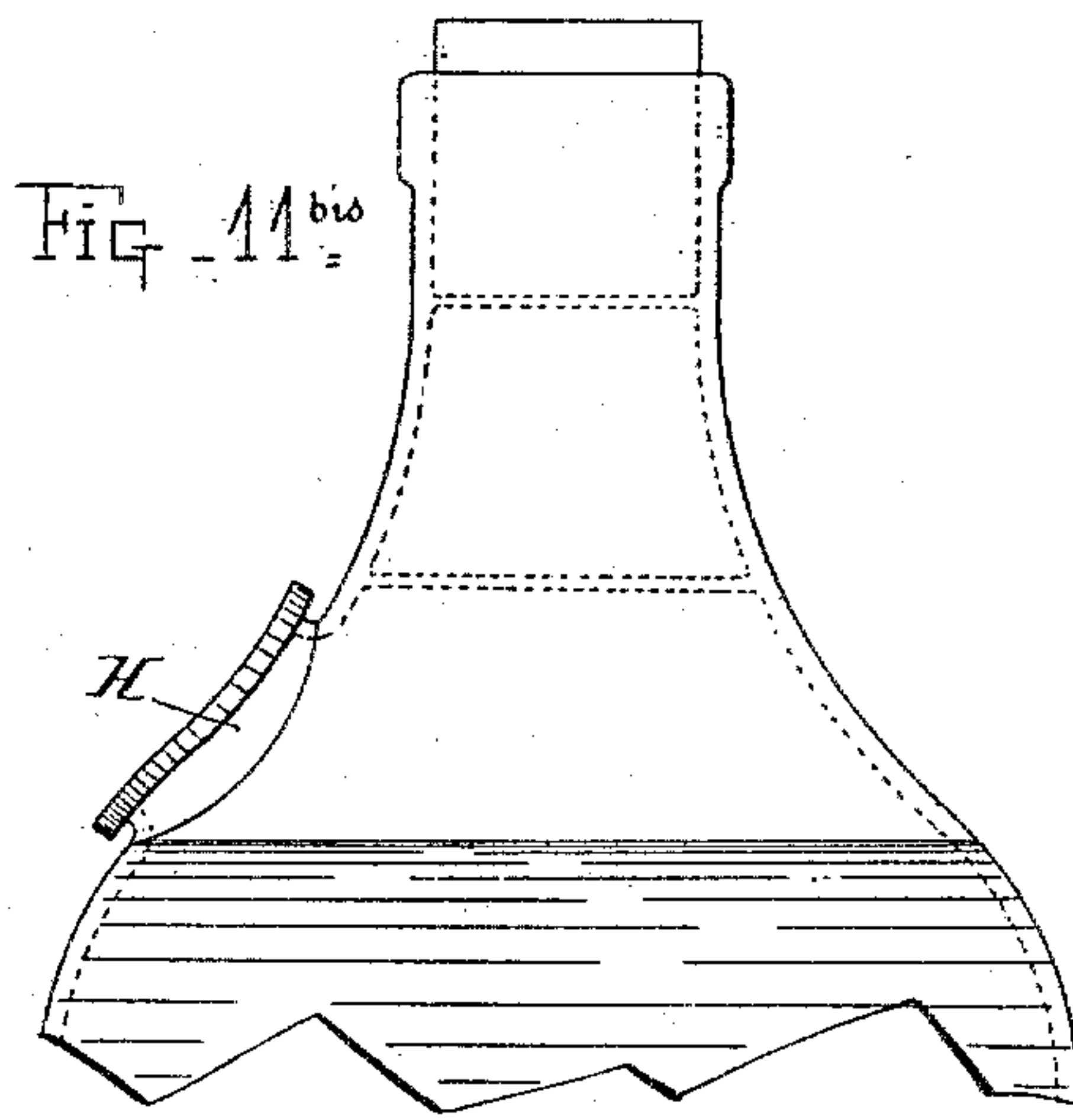
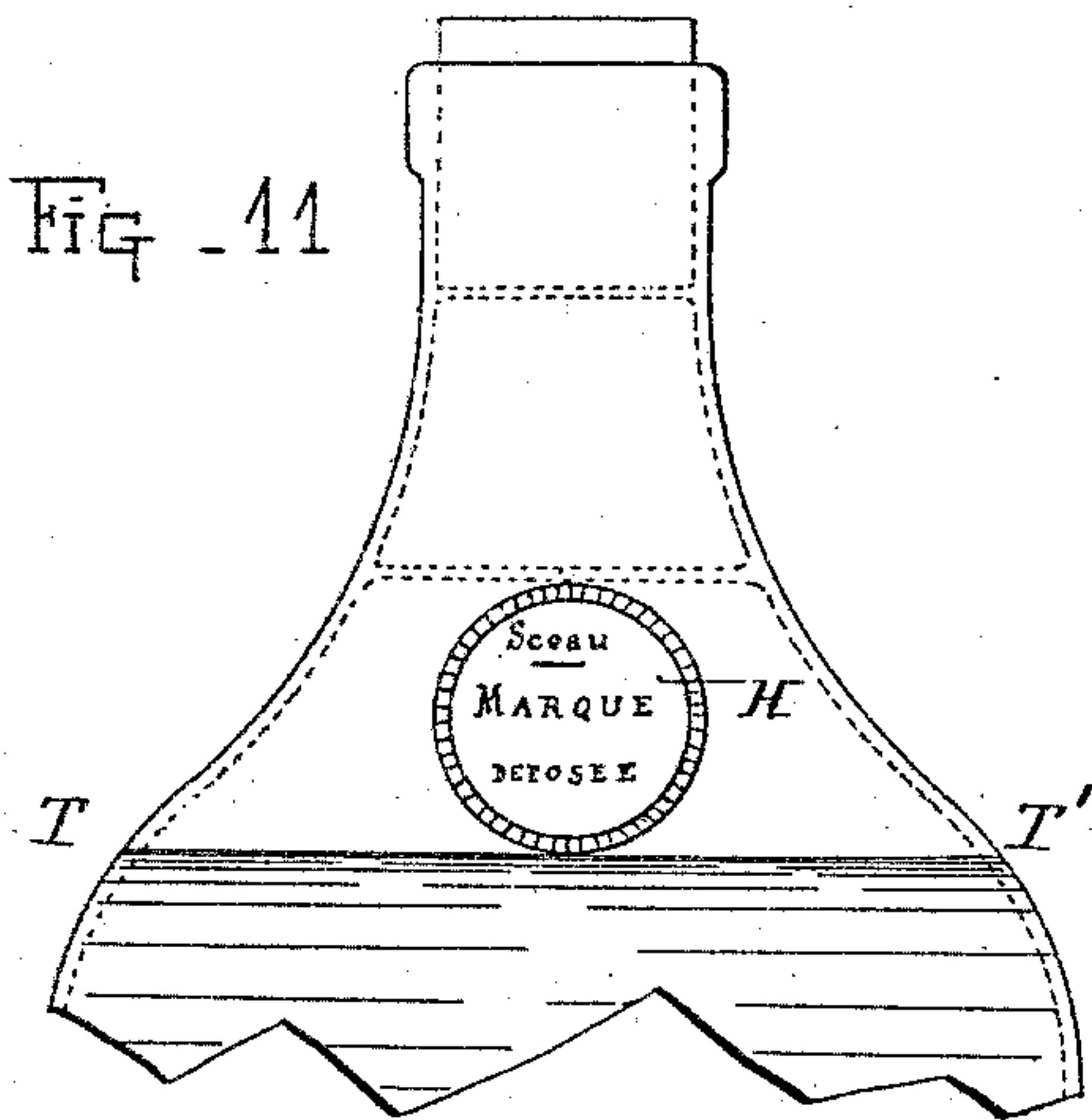
(No Model.)

3 Sheets—Sheet 2.

F. ROULAND.  
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Patented Feb. 1, 1898.



Witnesses:  
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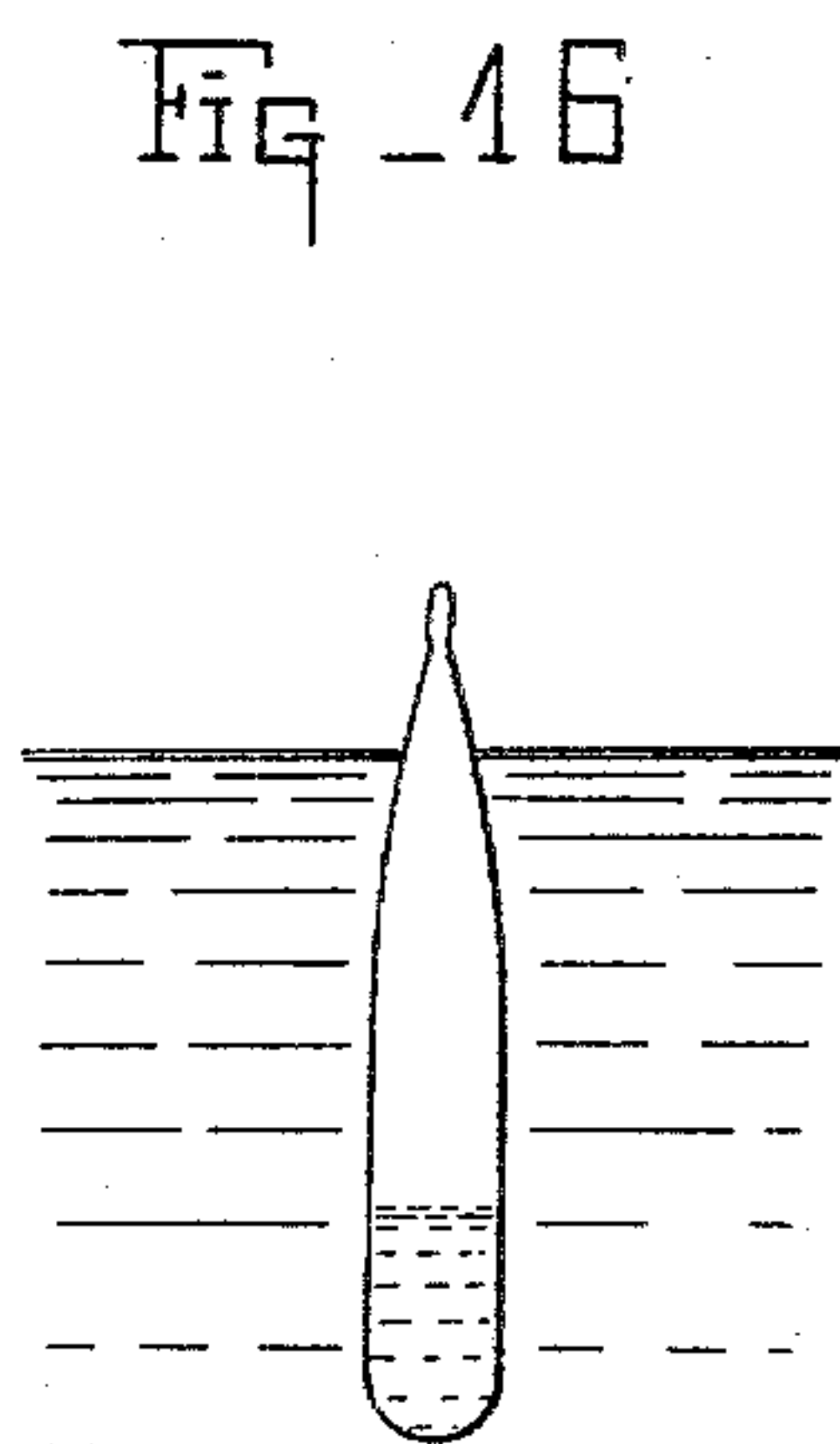
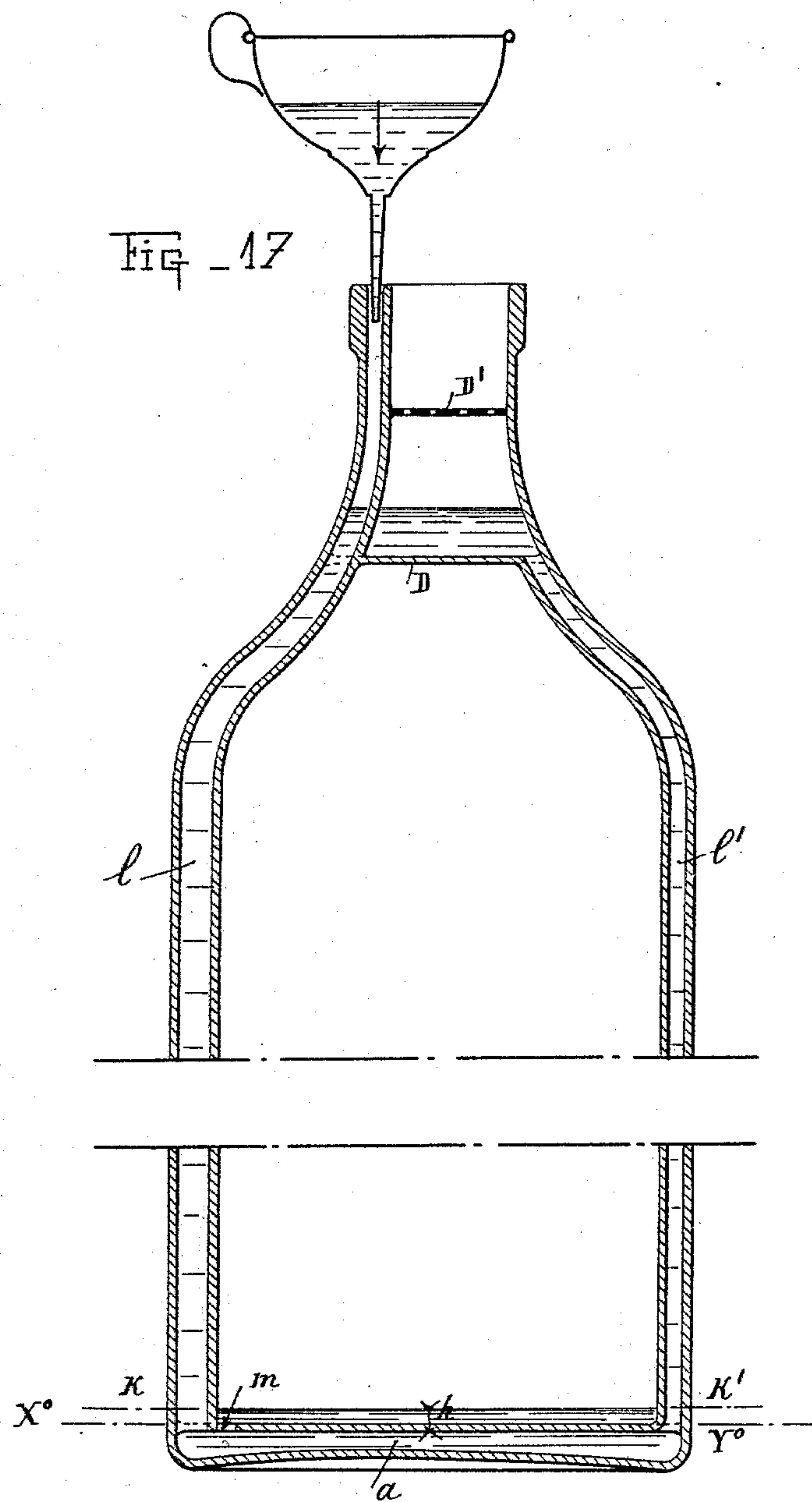
(No Model.)

3 Sheets—Sheet 3.

F. ROULAND.  
NON-REFILLABLE BOTTLE.

No. 598,117.

Patented Feb. 1, 1898.



Witnesses:-  
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# UNITED STATES PATENT OFFICE.

FRANCIS ROULAND, OF PARIS, FRANCE.

## NON-REFILLABLE BOTTLE.

SPECIFICATION forming part of Letters Patent No. 598,117, dated February 1, 1898.

Application filed September 29, 1896. Serial No. 607,295. (No model.) Patented in France June 27, 1896, No. 257,633; in Belgium August 18, 1896, No. 123,069; in Italy August 27, 1896, No. 42,507/264; in Austria August 28, 1896, No. 46/3,795; in Spain August 28, 1896, No. 19,579; in Luxemburg August 28, 1896, No. 2,599; in England August 29, 1896, No. 19,139; in Hungary September 2, 1896, No. 7,301; in Sweden September 4, 1896, No. 7,491; in Denmark September 4, 1896, No. 1,162; in Norway September 14, 1896, No. 5,270; in Turkey September 28, 1896, No. 537, and in Canada October 16, 1896, No. 54,433.

*To all whom it may concern:*

Be it known that I, FRANCIS ROULAND, a citizen of the French Republic, residing at Paris, France, have invented certain new and useful Improvements in Non-Refillable Bottles, (for which Letters Patent have been obtained in England, No. 19,139, dated August 29, 1896; in France, No. 257,633, dated June 27, 1896; in Belgium, No. 123,069, dated August 18, 1896; in Austria, No. 46/3,795, dated August 28, 1896; in Hungary, No. 7,301, dated September 2, 1896; in Italy, No. 42,507/264, dated August 27, 1896; in Spain, No. 19,579, dated August 28, 1896; in Luxemburg, No. 2,599, dated August 28, 1896; in Sweden, No. 7,491, dated September 4, 1896; in Norway, No. 5,270, dated September 14, 1896; in Denmark, No. 1,162, dated September 4, 1896; in Turkey, No. 537, dated September 28, 1896, and in Canada, No. 54,433, dated October 16, 1896,) of which the following is a full, clear, and exact description.

This invention has relation to bottles, jars, and similar vessels of that class which, having once been emptied of their contents, cannot be refilled with fraudulent imitations of the liquids once contained therein; and the invention consists in the novel construction, arrangement, and combination of parts, as hereinafter fully described, illustrated in the drawings, and pointed out in the appended claims.

In the drawings, Figure 1 is a vertical section of a bottle constructed according to this invention. Fig. 2 is a horizontal section through the body of the bottle. Figs. 3 and 4 are horizontal sections of the neck of the bottle on lines X Y and X' Y', respectively, of Fig. 1. Fig. 4<sup>bis</sup> is a view similar to Fig. 4, showing a slotted diaphragm. Fig. 5 is a plan view of Fig. 1. Fig. 6 is a vertical section through the neck of a corked or stoppered bottle. Fig. 6<sup>bis</sup> is an elevation of the stopper. Fig. 7 is a plan of the bottle, showing an internal diaphragm. Fig. 8 is a vertical section of the neck of a bottle, showing a slight modification in the arrangement of the

diaphragm. Figs. 9 and 10 are a vertical section and plan, respectively, of the neck of a bottle, showing a modified construction. Figs. 11 and 11<sup>bis</sup> are a front and side elevation, respectively, of the upper part of the bottle seen in Fig. 1. Figs. 12 and 12<sup>bis</sup> are vertical sections through the neck of a bottle of further modified construction. Fig. 13 is a horizontal section through B' B' of Fig. 12. Figs. 14 and 15 are plan views of the upper and lower diaphragms, respectively inserted in the bottle-neck, Fig. 12<sup>bis</sup>. Fig. 16 is an elevation of a cylindrical float. Fig. 17 is a vertical section of the bottle.

The bottle, jar, or other vessel is constructed of glass, stoneware or earthenware, metal, or other suitable material and is provided interiorly with a vertical passage *l*, whose area is gradually decreased toward its upper end, and it extends from the mouth of the bottle nearly to the bottom thereof. The vessel is also provided, preferably diametrically opposite to the passage *l*, with a second vertical passage *l'*. This passage is the same size throughout its whole length and slightly smaller than the passage *l*. The air enters freely through the passage *l'* and to the interior of the receptacle to allow of the contents being emptied.

The bottle is provided with a false bottom *p*, which is cut away at *m* for the passage of the liquid to the outlet-passage *l*. The chamber *a* between the bottoms connects the two lateral passages *l l'*. The passage *l'* opens at its upper extremity into an air chamber or space *A*, formed by two diaphragms *D D'*. The lower diaphragm *D* is solid and the two passages *l l'* pass through it. The passage *l* also passes through the upper diaphragm.

The diaphragms may be made integral with the bottle during the manufacture or they may be movable diaphragms of glass, fixed and sealed in the empty neck after filling.

The two methods of forming the diaphragms inclosing the air-chamber entail two different methods of effecting the filling of the bottle. When the diaphragms are integral with the



bottle, the diaphragm D' is provided with air-inlets of any desired shape, Figs. 1, 4, 4<sup>bis</sup>, and 7, but of a capillary size, so that air can enter freely into the chamber without it being possible for any liquid to pass into the bottle from the outside. A space is left in the neck of the bottle above the upper diaphragm for receiving any kind of stopper—for example, a cork stopper B<sup>2</sup>. The stopper should be cut out, so as to surround the passage *l* and also cover the upper end of the latter when said stopper is seated in the neck of the bottle, or, instead of using a stopper of this construction, an ordinary stopper may be used to seat in the neck and a separate flat piece of cork, as indicated in Fig. 6, used to cover the upper end of passage *l*, said piece being cemented or otherwise suitably secured to the upper face of the stopper proper. When the diaphragms are fixed in place after the bottle is filled, the upper diaphragm D' is secured in the extreme upper end of the bottle and is covered by a disk E, of cork, glass, or other suitable material, secured to the diaphragm, Fig. 8, the exterior capsuling of the neck serving also to keep the disk in position.

In the construction seen in Figs. 9 and 10 the upper diaphragm F is not perforated, but air-inlets G are provided in the side of the neck. This diaphragm F completely closes the neck, with the exception of the outlet of the passage *l*, which is closed as described with reference to Fig. 8 or by the capsuling of the bottle alone on account of the small section of the outlet as compared with the total section of the neck. The air-inlets G are closed by the capsuling of the neck and opened when necessary by the destruction of the said capsule. When the diaphragms are integral with the bottle, the latter is filled in the first instance through a special opening H, Figs 11 and 11<sup>bis</sup>, formed with its edges slightly projecting from the external surface of the body of the bottle. When the initial filling is effected up to the line T T', a simple cork stopper is introduced into the opening and cut level with the edges, and the whole is sealed with sealing-wax or other substance. These seals are provided with the trade-mark or other particular devices or matter. If it is desired to make use of the sealed opening H for a second filling, the original seals would have to be destroyed and replaced by imitations easily recognized. The liquid is poured out through passage *l* without unsealing the opening H. When the diaphragms are to be fixed after filling the bottle—for example, as in the arrangement shown in Figs. 12, 12<sup>bis</sup>, 13, 14, and 15—the neck of the bottle above the level V V' is made cylindrical. Solid projections *ee'*, forming part of the bottle, act as supports for a movable diaphragm D'', of wood, glass, aluminium, or other substance. This diaphragm, Fig. 15, has two indentations fitting around the interior projections forming the passages *ll'*. It is provided on its periphery with a rubber fillet C, which fits the cy-

lindrical part of the neck and fits tightly against the projection of the passages *ll'*. At the upper level of the projections *ee'* are two enlargements B', extending only over a portion of the horizontal section of the neck. Above these enlargements is a cylindrical portion forming the air-chamber A, into which the tube *l'* opens. At the upper part of the air-chamber, at a short distance from the open edge, the neck is slightly enlarged, forming a kind of cup S, the bottom of which is designed to receive a disk or diaphragm F', Figs. 12<sup>bis</sup> and 14, analogous to the first except that it has only the indentation corresponding to the channel *l*, the channel *l'* not extending to this level in the neck. The bottle being filled up to the level V V' through the open end of the neck, the diaphragm D'' is then inserted into the neck and forced down to the supports *ee'*. A fusible substance of some kind is then poured from above up to a suitable height, the substance used being such as will make a seal, firmly fixing the diaphragm in position. The interior of the enlargements being filled with this fusible substance assists considerably in the securing operation. The diaphragm D'', sealed as just described, forms the base of the air-chamber. The disk F' is then placed at the bottom of the cup S, and the fusible substance on which the seals, trade-mark, label, or the like is placed is then poured on up to the top edge. The outlet-passage *l* must of course extend up to the top of the seal, its end always remaining open. It is then covered temporarily by a capsule. It will be obvious that in this case the air-inlet must be formed at the side, according to the construction seen in Fig. 9.

When emptying, the bottle is held so that the passage *l* is underneath, the passage *l'* therefore being uppermost. The liquid flows through the terminal orifice of passage *l*, and air enters the air-space through the air-inlet openings in the neck to thus cause the free discharge of the liquid. A portion of the liquid in passage *l'* will at first flow into the air-chamber when the bottle is first tilted, and therefore the capacity of the chamber should be such that the liquid from the passage *l'* only occupies in it a small space, in order not to disturb the entry of the air. The air entering the air-chamber passes into the passage *l'*, the space between the bottoms of the bottle, the opening *m*, and into the interior space of the bottle, and allows a constant flow to take place. The bottle being emptied it cannot be refilled through the terminal orifice of passage *l*.

Fig. 17 shows the condition of the bottle after an attempt to refill it, said figure showing a funnel, containing liquid, with its point inserted in the end of passage *l*, and the liquid falls drop by drop into said passage, and when the liquid fills the space *a* to the level X<sup>0</sup> Y<sup>0</sup> the air which fills the whole of the empty space within the bottle resists compression and the liquid is compelled to rise in the



passage  $l'$  and into the air-chamber A, which it finally fills, and hermetically closes it. By reason of the enormous difference between the sections of the body of the bottle and the passage  $l'$  the liquid can only rise inside the bottle to a very small degree, as indicated at K h K'. A similar result is obtained by giving the bottle any other position during the attempt to refill it.

10 In case refilling is attempted by first exhausting the air from the bottle and then immersing the bottle in the liquid to be bottled the liquid would enter everywhere within the bottle and into the air-chamber, which it would close, thus rendering subsequent outflow impossible.

To prevent partial refilling, when the initial filling is complete and before sealing the flask a small cylindrical float, Fig. 16, is introduced through the open neck. Into this float of thin glass a poisonous or non-poisonous liquid very volatile at ordinary temperatures is introduced, and it is then suitably closed. The float should be so loaded as to keep it upright in the liquid and almost completely immersed, and its presence does not interfere with the normal emptying of the liquid. It descends as the level of the liquid descends and is of course left at the bottom when the liquid is emptied. If it is then sought to exhaust the device, the float soon explodes and renders the bottle unfit for subsequent use.

What I claim is—

1. A bottle of the character described having diaphragms arranged in the neck thereof forming between them an air-chamber, the latter being adapted to communicate with the outer air, passages  $l, l'$ , formed in the bottle, the upper end of the passage,  $l$ , terminating on a line with the upper edge of the neck, and

the upper end of the passage  $l'$  leading to the air-chamber, a false bottom for the bottle forming between it and the true bottom a space communicating with the two passages, said false bottom having an opening communicating with the space beneath it and with the interior of the bottle, and a closing device adapted to seat in the neck of the bottle and to cut off communication between the air-chamber and the outer air and also to close the upper open end of the passage,  $l$ .

2. A bottle of the character described having diaphragms arranged in the neck thereof forming between them an air-chamber, the latter being adapted to communicate with the outer air, passages  $l, l'$ , formed in the bottle, the upper end of the passage,  $l$ , terminating on a line with the upper edge of the neck, and the upper edge of the passage  $l'$  leading into the air-chamber, a false bottom for the bottle forming between it and the true bottom a space communicating with the two passages, said false bottom having an opening communicating with the space beneath it and with the interior of the bottle, a closing device adapted to seat in the neck of the bottle and to cut off communication between the air-chamber and the outer air and also to close the upper open end of the passage,  $l$ , the said passages,  $l, l'$  increasing in sectional area from their upper ends downwardly to where they communicate with the space beneath the false bottom.

In testimony that I claim the foregoing I have hereunto set my hand this 6th day of August, 1896.

FRANCIS ROULAND.

Witnesses:

H. T. SMITH,  
VICTOR WATRAY.