(No Model.)

2 Sheets—Sheet 1.

E. STERN.

APPARATUS FOR IMPREGNATING LIQUORS IN BOTTLES.

No. 478,652. Patented July 12, 1892.

Fig. 1.

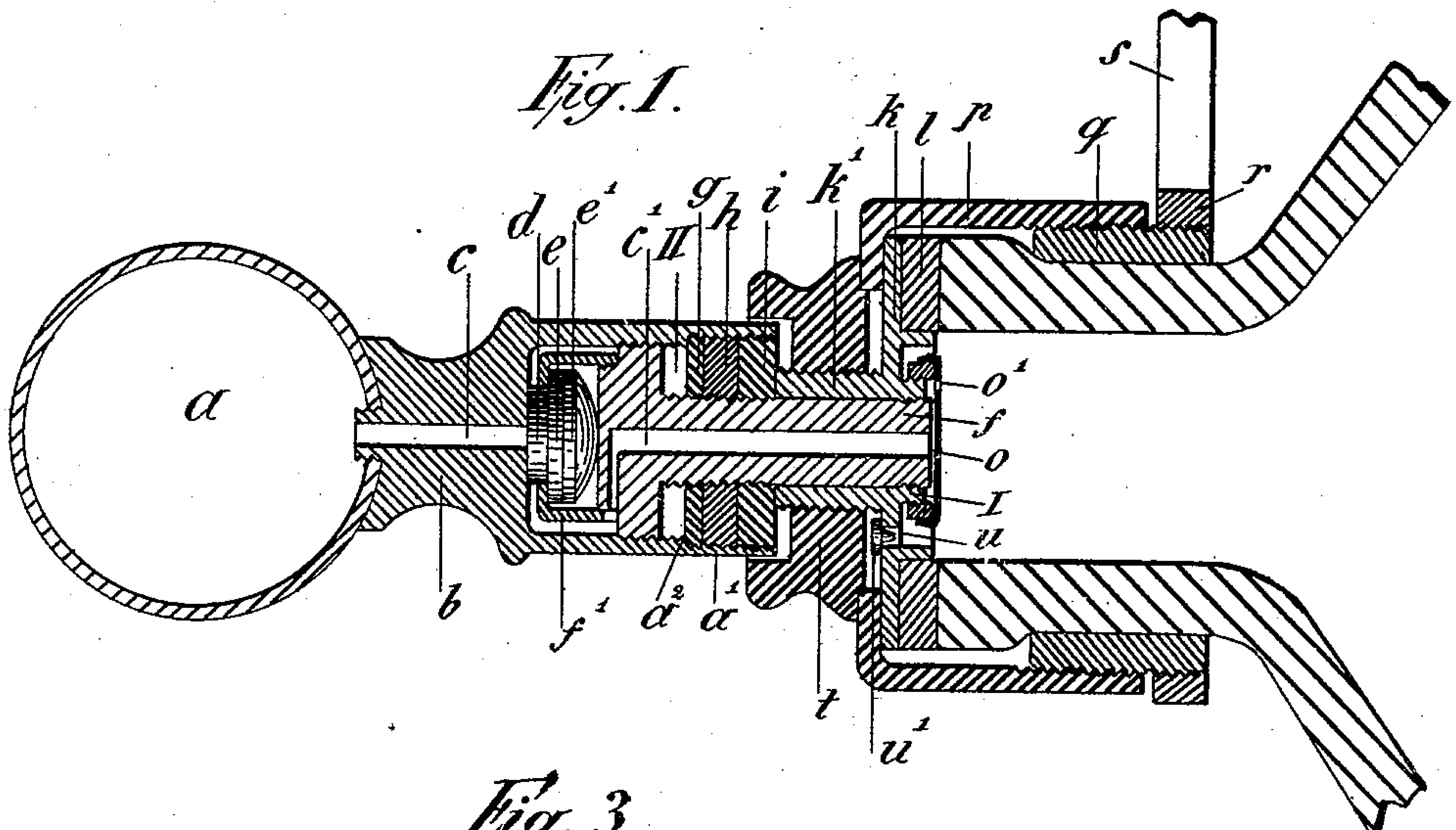
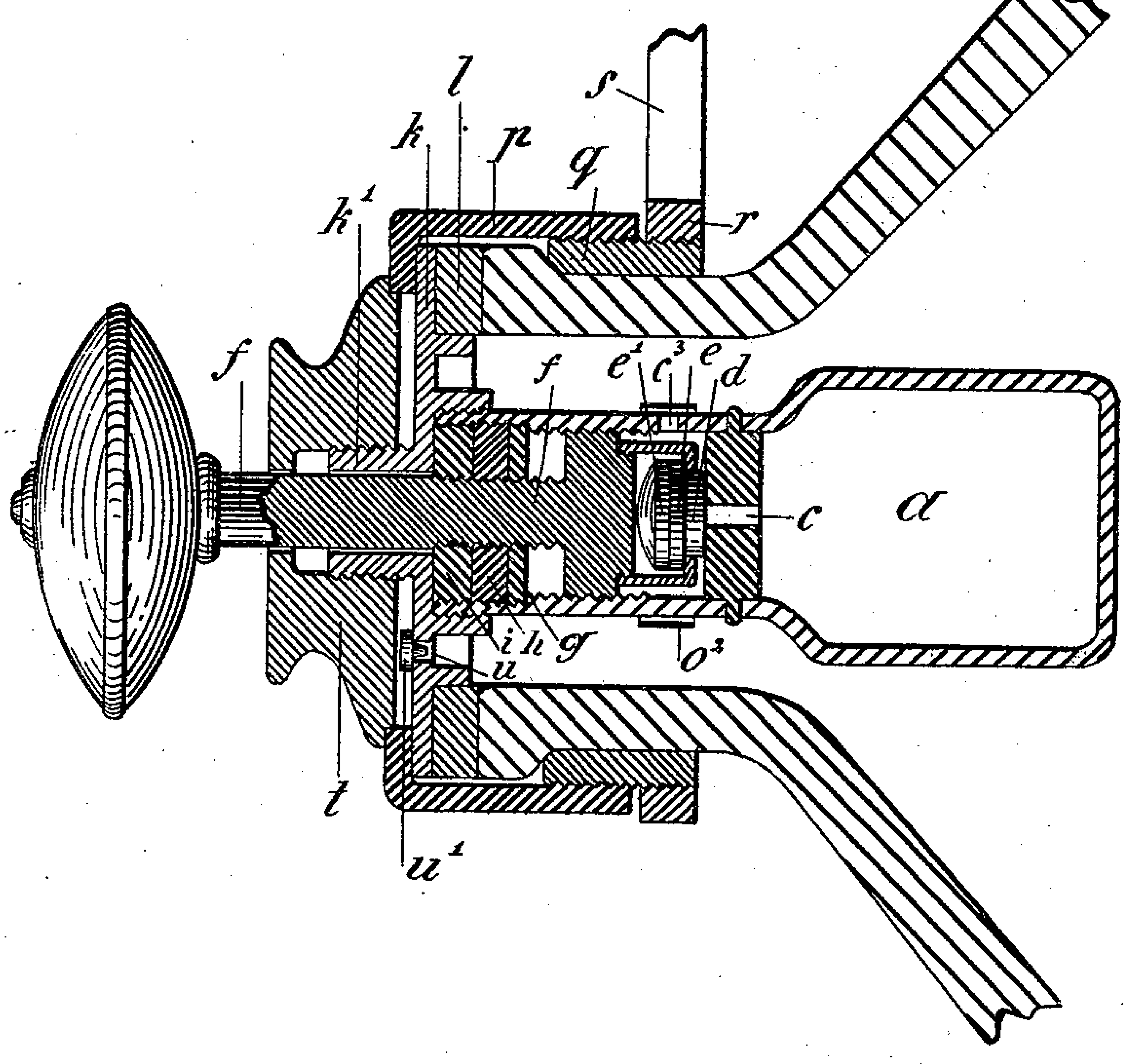


Fig. 3.



Witnesses.

[illegible]

v. Fischer

Inventor.

Emil Stern

per Wasa Theodorović

Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

2 Sheets—Sheet 2.

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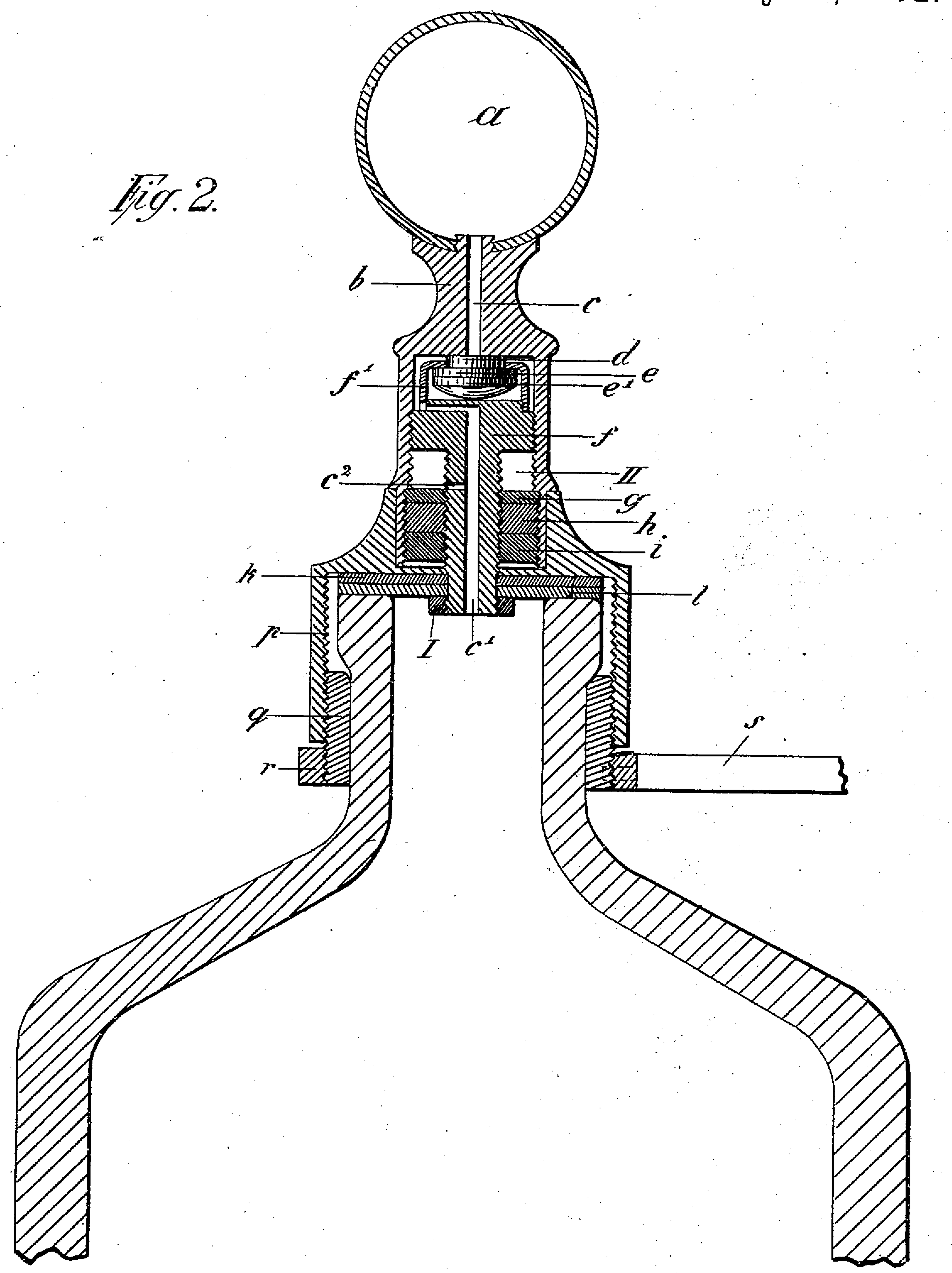
Fig. 2.



Witnesses.
Fred Meyer
W. Fischer

Inventor
Emil Stern
per Wasa Theodorović
Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EMIL STERN, OF VIENNA, AUSTRIA-HUNGARY.

APPARATUS FOR IMPREGNATING LIQUORS IN BOTTLES.

SPECIFICATION forming part of Letters Patent No. 478,652, dated July 12, 1892.

Application filed December 12, 1889. Serial No. 333,682. (No model.)

To all whom it may concern:

Be it known that I, EMIL STERN, engineer, a subject of the King of Hungary, residing in the city of Vienna, in the Province of Lower Austria, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in the Process of and Apparatus for Impregnation of Any Liquors Directly in Bottles, Pitchers, or Siphons, of which the following is a specification.

The present invention relates to a process to impregnate any liquors directly in bottles, pitchers, or siphons with carbonic-acid or any other gas, which may be done by any one and at any time easily and without any danger. This process consists, essentially, therein that hulls or cases containing the liquid or compressed carbonic-acid or any other impregnating gas are adjusted upon bottles, pitchers, or siphons filled with any liquor or other beverage, (in or outside of said bottles, &c.,) and eventually may serve, at the same time, to cork them, and by opening the closed hulls or cases the impregnating-gas contained therein is caused to pass into the filled bottle, pitcher, or siphon in order to impregnate the beverages contained therein.

In the accompanying drawings, Figure 1 is a vertical section elevation. Fig. 2 is a side view of the same. Fig. 3 is a vertical sectional view of a modification.

Fig. 1 of the accompanying drawings represents a hull or case for this process in vertical section. The gas is introduced, either compressed or liquid, into the upper part *a*, which, for instance, is represented in the drawings in the form of a ball, of a case or hull, shaped in any manner, by means of a longitudinal canal *c'*, a screw-spindle *f*, and the outlet-canal *e* of the hull or case, and it is closed by means of a piston *d*, consisting, preferably, of india-rubber. The piston *d* reposes loosely on a flat disk *e* and on a second disk *e'*, which is convex at its under part and fixed in a hull *f'*, screwed rigidly on the upper end of the spindle *f*. The spindle *f* itself is screwed into the hull or case. The piston *d* reposing loosely on both movable disks *e* and *e'* in the inner part of the hull *f'*, the upper end of the piston, which reaches from the hull *f'*, is pressed against the outlet of the canal *e* in the neck *b*, if the spindle is screwed upward or if the hull or case is screwed downward, without changing its position or being turned therewith, and in such a manner that in consequence of its elasticity it binds itself rigidly against the outlet of this canal *c* and closes it completely, whereby the highly-compressed gases in the hull *a* are entirely cut off. A little disk *g*, fixed loosely in the part *a'* of the hull or case and lying against an inner ring-shaped projection a^2 of the latter, and a second disk *i*, screwed into the before-mentioned part *a'* of the hull or case, forms with a little disk *h*, of india-rubber or leather, which is arranged between the two former ones, a kind of stuff-box for closing the space I I hermetically. The spindle *f* reaches through the three disks *g*, *h*, and *i* and plunges below into the neck-piece *k'* of a disk *k*. In the length of this neck-piece *k'* it is not cylindrical, as in the other part, but prismatical, in order not to be turned round therein. By screwing rigidly a screw-nut I (on which eventually a second screw-nut may be screwed) the spindle *f* is fixed into the neck-piece *k'*. On this screw-nut I a case or valve *o*, of india-rubber, is arranged, (after the hull *a* has been filled with gas,) which is provided with one or more side openings *o'*. The said valve *o*, of india-rubber, allows the gases to enter into the bottle, pitcher, or siphon, being pressed down by the highly-compressed gas coming from the under end of the spindle in such a manner that the gas may enter into the side openings *o'* and through these into the bottle; but in inverse sense it hinders the entering of the air and of the liquors from the bottle, pitcher, or siphon into the hull, laying itself against the under end of the spindle as soon as the current from the gases from the case or hull ceases in consequence of its elasticity, and at the same time by the pressure of the gas in the bottle, and thus closing the canal *c'*.

In the drawings the valve *o* is shown lying against the under end of the spindle *f*. A screw-nut *t*, screwed on the outer side of the neck *k'*, causes, if screwed up or down, the opening or closing of a valve *u'* in the canal *u* of the disk *k*. A disk or ring *l*, of india-rubber, arranged below the disk *k*, closes the

hull or case at the neck of the bottle, pitcher, or siphon. The hull or case is fastened to the neck of the vessel by means of a "holländer" *p*, which is screwed on the neck-ring *q*, provided with a worm of a screw. The said ring may be provided with a handle *s* in order to hold it.

The practical use of the described device is essentially as follows: The bottle, pitcher, or siphon is filled for about three-fourths of its capacity with any liquor to be impregnated and the hull or case is fixed on the neck of one of the mentioned vessels by means of the holländer *p*. If this is done, the holländer *p* is held by one hand (preferably by the left hand) and by the other hand the case or hull *a* is turned round about ninety degrees to the left and immediately back to the right into the original position. If turned to the left, the hull *a* moves upward, so that the piston *d* withdraws from the canal *c*, the latter is opened and through it a part of the compressed gas enters into the space II, from here through the canal *c'* of the spindle *f* into the valve *o*, of india rubber, and, raising this latter, through its side openings *o'* into the bottle, pitcher, or siphon. A turning to the right, following rapidly after the turning to the left, of the hull *a*, prevents the whole quantity of the gas from entering at once from the hull into the bottle. The quantity streaming out is justly sufficient to raise the atmospherical air contained in the liquor and in the empty space of the vessel, which can take place so much the more easily, the air in most cases being specifically lighter than the compressed gas. The mixing of the latter with the liquor may be accelerated by shaking the bottle, &c. If after this process the screw-nut *t* is screwed a little upward, the valve *u'* is raised by the inner pressure and the atmospherical air and a little quantity of gas stream out from the bottle, &c., through the opening *u*, so that the liquor becomes perfectly free from the atmospherical air, this being a chief condition for well impregnating. The streaming out of the air takes place very rapidly in consequence of the inner pressure, and therefore a rapid screwing-down of the screw-nut *t* must follow in order to close the valve. By turning now the hull *a* to the left the outlet is opened again, so that the remaining contents of the hull flow into the bottle, pitcher, or siphon through the canals *c c'*. Now the vessel is again shaken a little and the liquor will be completely impregnated. Of course the compressed or dropping liquid gas may be introduced into the bottle, pitcher, or siphon at once, instead of in two quantities, as described, or, also, in more than two quantities. Before the bottle, pitcher, or siphon is opened the superfluous gas is caused to stream out by opening the valve *u'* and only then the emptied hull is taken off by screwing off the holländer *p*.

Fig. 2 is a side view of a modification of Fig. 1. This figure represents the apparatus about in its natural size, Figs. 1 and 3 (the latter being described hereinafter) showing it in a greater than its natural size.

Fig. 3 shows a vertical section of another modification, in which the hull, which can be closed, is adjusted below the holländer and reaches into the bottle, pitcher, or siphon. The filling and emptying of the case or hull *a* take place by means of its side opening c^3. The opening and closing of the canal *c* do not take place by turning the hull or case *a*, but by turning the spindle *f*, which in this case is not provided with the canal *c'*; but it has on its end projecting from the neck of the vessel a handle or button for managing it more easily. In order to close the canal c^3, a ring o^2 of india-rubber is adjusted instead of the valve of india-rubber. The other parts of the construction are essentially identical with those of Fig. 1. The metal hulls are tried for carbonic acid with two hundred and fifty atmospheres. They are used, however, only with about fifty-five to sixty atmospheres. Equally the bottles to be used are examined with thirty atmospheres, and used only with a maximum of six and one-half atmospheres, so that the working with the described device is quite without any danger. According to the described method those liquors can also be impregnated which till now could not be impregnated, because they decompose after a short time and for this reason could not be brought on the market impregnated. By this invention this inconvenience falls out, because every one can impregnate the liquor himself at any time.

I claim—

1. A device for impregnating liquids in bottles with gas, consisting of a receptacle for containing gas, detachably secured to the bottle-neck, and a passage controlled by a valve leading from said receptacle to the bottle, said valve being opened and closed by the upward and downward movement of the receptacle, as and for the purpose set forth.

2. A device for impregnating liquids in bottles with gas, consisting of a receptacle for containing gas, detachably secured to the bottle-neck, a passage controlled by a valve leading from said receptacle to the bottle, said valve being opened and closed by the upward and downward movement of the receptacle, and a port in an annulus, communicating with the interior of the bottle and controlled by a valve and a ring for the purpose of allowing the atmospheric air and superfluous gas to escape, substantially as described.

In testimony whereof I sign this specification in presence of two subscribing witnesses.

EMIL STERN.

Witnesses:

RUDOLFSON PLANK,

NETTIE S. HARRIS.