P. GIRON.

APPARATUS FOR CHARGING CAPSULES WITH LIQUEFIED GAS.

APPLICATION FILED AUG. 15, 1906.

913,656. **Patented Feb. 23, 1909.**

2 SHEETS—SHEET 1.

Fig.1.

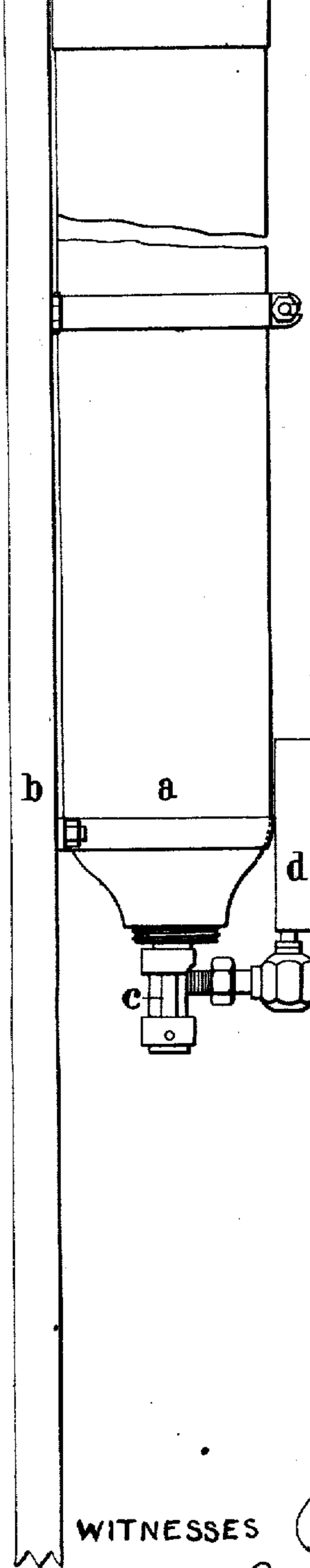
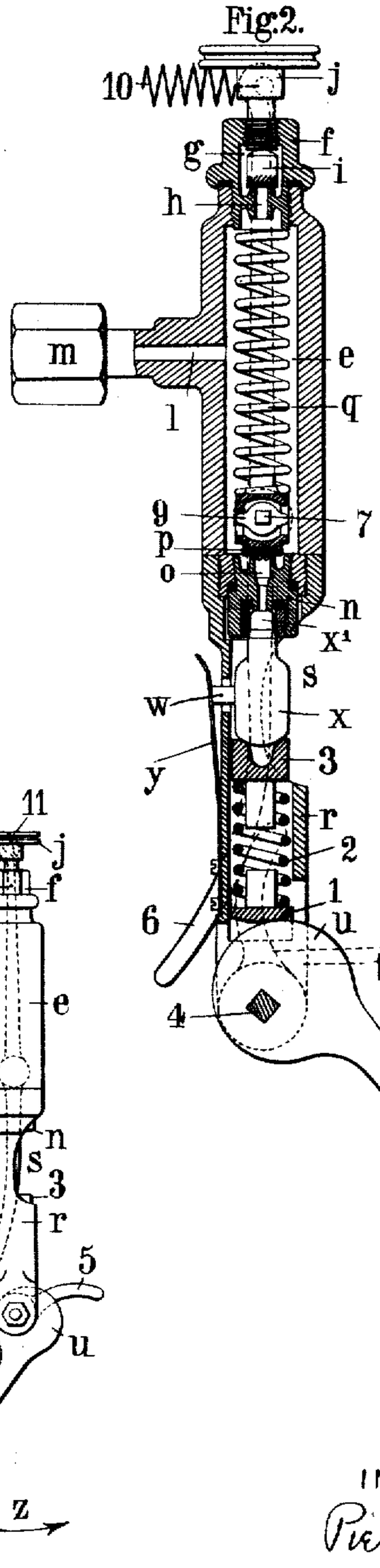


Fig.2.



WITNESSES

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Fig.3.

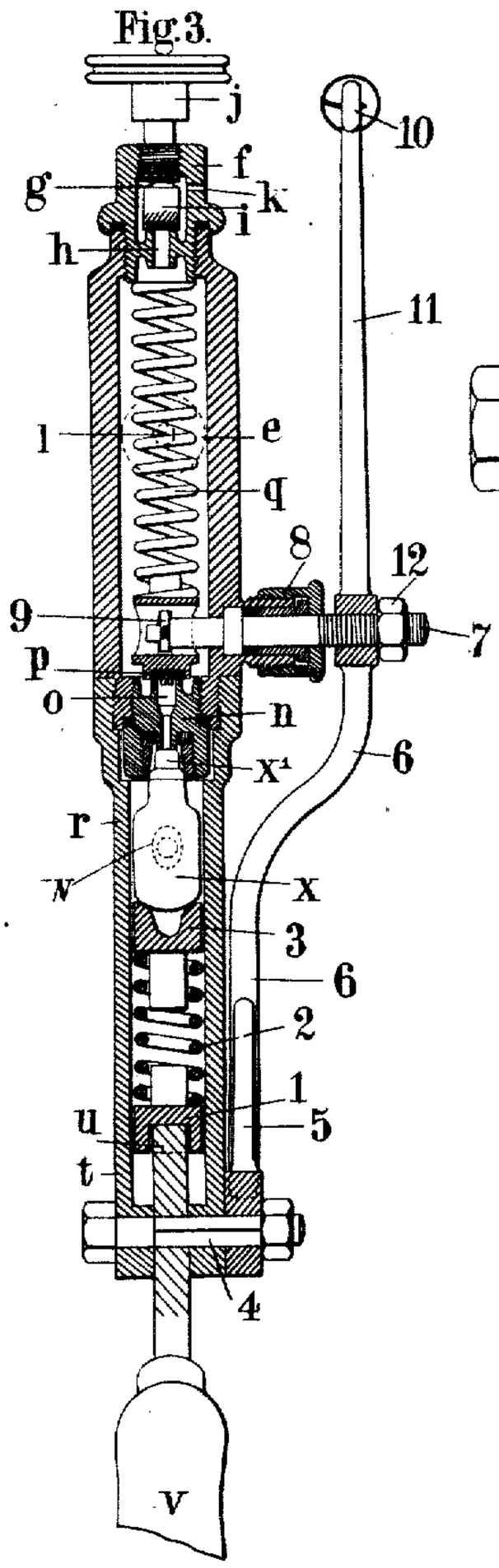
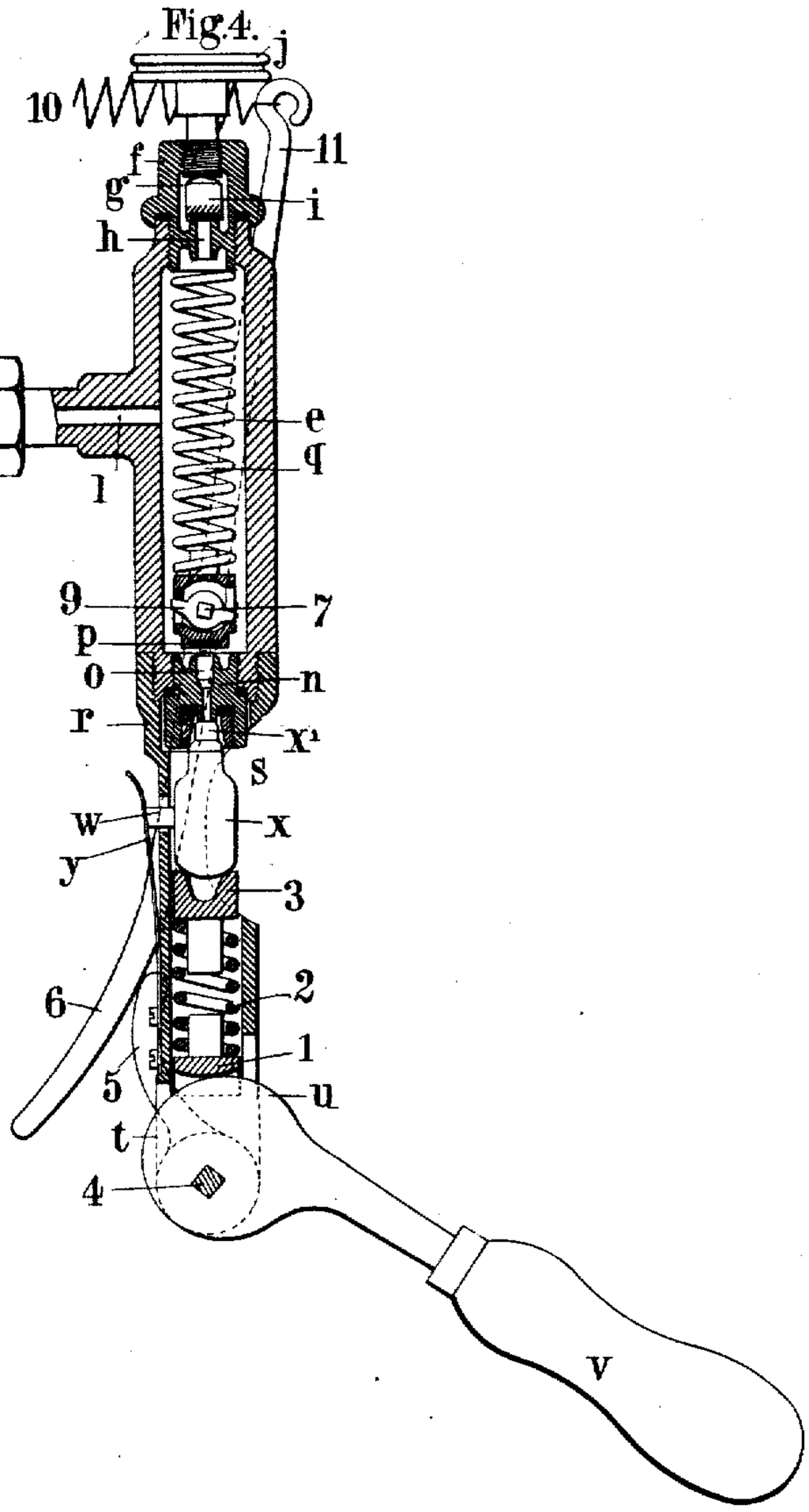


Fig.4.



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UNITED STATES PATENT OFFICE.

PIERRE GIRON, OF PARIS, FRANCE.

APPARATUS FOR CHARGING CAPSULES WITH LIQUEFIED GAS.

No. 913,656. Specification of Letters Patent. Patented Feb. 23, 1909.

Application filed August 15, 1906. Serial No. 330,733.

To all whom it may concern:

Be it known that I, PIERRE GIRON, a citizen of the Republic of France, residing at 9 Rue Castex, Paris, France, have invented certain Improvements in Apparatus for Charging Capsules with Liquefied Gas, of which the following is a full, clear, and exact description, and for which I have applied for Letters Patent in France, dated August 25, 1905, (not issued).

This invention relates to an apparatus which permits of decanting liquefied gas instantaneously and automatically from a large vessel, such as a cylinder of liquefied carbonic gas, into a small vessel, such as a capsule, without loss of gas, or pressure, and without an intermediate compressor device. The apparatus also permits of the expulsion of any air which may be contained therein before use or in the small vessels before they are charged.

The cylinders of liquefied carbonic acid gas to which this apparatus is particularly adapted, contain the liquefied gas at a pressure varying with the atmospheric temperature but generally exceeding 50 atmospheres. At this pressure the gas has not been utilized directly for its customary purposes such as for drawing beer, the saturation of liquids, the manufacture of soda water and so forth; but has been drawn from the cylinder through appliances known as pressure reducers which reduce the pressure of the gas to such an extent that the liquefied gas returns again to its gaseous state.

Heretofore if it has been desired to decant the contents of a large cylinder of liquefied carbonic acid into another container of smaller dimensions, at the same time maintaining in the latter a pressure at least equal to that in the former, no means were known other than the use of an intermediate compressor or pump which received the expanded gas from the pressure reducer and delivered the same re-compressed. This has heretofore been the customary way of charging the small capsules or bulbs containing a few grams of liquid carbonic acid by which siphons or selzogenes of a type now common, may be aerated. When a capsule has been emptied, it has been returned for recharging, and it has been necessary for this purpose to send it to a central factory provided with all the necessary recharging appliances. Obviously it would be highly advantageous if this empty capsule could be re-charged on the spot, since liquid carbonic acid cylinders are obtainable everywhere. It would however, be impracticable to install compressors or mechanical pumps in the establishments of all retail dealers in siphons and capsules.

The present invention provides a hand appliance by which capsules may be charged directly from the cylinder of liquefied gas.

An apparatus embodying my invention is shown in the accompanying drawings, in which,

Figure 1 represents the general installation of the apparatus and the cylinder of liquid carbonic acid for charging small capsules. Fig. 2 is a vertical sectional elevation of the apparatus properly so-called, and shows a capsule ready for charging. Fig. 3 is a vertical section at right angles to the foregoing. Fig. 4 represents a vertical section similar to Fig. 2, but in which the operative parts of the apparatus are shown in the position which they occupy at the moment at which the capsule is being charged.

The cylinder *a* containing the liquefied gas is fixed upon a beam *b* or a vertical wall; the said cylinder being inverted, that is to say its aperture is arranged downwards, and this aperture is provided with the valve head *c* supplied with the cylinder. A pressure gage *d* is screwed to the head *c* and next to this pressure gage, which indicates the pressure of the gas in the cylinder *a*, the charging apparatus forming the object of the present invention, is fixed.

This apparatus comprises a receptacle *e* in the upper part of which there is screwed a cap *f* having a chamber *g* into which a passage *h* opens; a hand screw *j* maintains a valve *i* on this passage. The passage *h* communicates with the receptacle *e* and the chamber *g* is in communication with the atmosphere by means of a small passage *k* (Figs. 1 and 3). The receptacle *e* comprises a socket *l* connected by means of a nut *m* with the socket of the pressure gage *d*. To the lower part of the receptacle *e* there is screwed a part *n* in which there is formed a passage *o* which is closed by a valve *p* held by a spiral spring *q* bearing on the one hand against the valve and on the other against the head *f*. The receptacle *e* is prolonged by a tubular part *r* cut away at *s* and terminating in a fork *t* in which there is journaled a cam *u* adapted to be operated by hand by means of a handle *v*. Upon the part *r* there

is fixed a leaf spring *t* provided with a finger *w* which extends into the interior of the said part opposite the recess *s*. Inside the part *r* there is arranged a yoke *l* held upon the cam *u* by a spiral spring 2 at the upper part of which a member 3 is arranged. An arm 5 is fixed upon the spindle 4 of the cam *u*. The valve *p* is operated by the arm 5, which, when the handle *v* is actuated, rocks a lever 6. This lever is solid with a spindle 7 entering the receptacle *e* through a stuffing box 8 and at the extremity of which there is fixed a kind of cam 9 which lifts the valve *p* compressing the spring *q*. This lever returns to the closed position of the valve under the influence of a spiral spring 10 attached to the wall *b* and to the arm 11 of the lever 6. In order that the finger 5 may act at the proper moment upon the lever 6, this latter is screwed upon the spindle 7 and a nut 12 maintains it in a given position, so that it is possible to accelerate or retard the moment at which the valve *p* opens.

The apparatus thus constituted being mounted on the head of the cylinder as shown in Fig. 1, if the valve *c* is opened the gas fills the receptacle *e* which is closed at its upper part by the valve *i* and at its lower part by the valve *p;* under the pressure of the gas, the air contained in the pipe of the pressure gage and also in the latter, as well as that contained in the receptacle *e*, and in its socket is compressed at the upper part of this receptacle beneath the valve *i* which is held down by the hand screw *j;* in any case, this air cannot rise into the cylinder *a*. Under these conditions, if it is desired to charge a capsule *x*, it is placed upon the part 3, its head x^1 being placed inside the part *n*, and the finger *w* pressed back by actuating the handle *v* in the direction indicated by the arrow *z* (Fig. 1) the cam *u* causing the part 3 to rise thereby vigorously applying the orifice x^1 of the capsule *x* against the base of the passage *o* (Figs. 2 and 3). On continuing to actuate the handle *v* the arm 5 encounters the lever 6, causing the same to rock and its spindle 7 as well as the cam 9 to rotate, thereby lifting the valve *p* and placing the passage *o* in communication with the receptacle *e*. Under the pressure of the gas contained in the receptacle *e* the valve which closes the orifice x^1 of the capsule *x* opens and the gas rushes into the latter, forcing out the air contained therein, this air rising to the upper part of the receptacle *e* where it accumulates and is compressed in proportion as charges are effected. The charging of the capsule is instantaneous and it is therefore only necessary to turn off the handle *v* immediately, the arm 5 releasing the lever 6, which, returned by the spiral spring 10 resumes its position of repose thus closing the valve *p*, which likewise becomes applied to the extremity of the passage *o* under the influence of the spiral spring *q*. The apparatus then returns to the position shown in Figs. 1 and 2, that is to say with the passage *o* closed and the charged capsule still firmly applied to the base of this passage. As the valve of the said capsule is closed at this moment, the pressure of the receptacle *e* no longer acts upon it, and it is therefore the pressure of the gas that it contains which insures its closing. By continuing the depression of the handle *b*, the depression of the part 3 releases the capsule *x* from the part *n*, the finger *w* assisting in this release under the influence of the spring *y*. The apparatus is then ready for charging another capsule.

From time to time the air accumulated beneath the valve *i* is expelled; for this purpose it is only necessary to give one or two turns to the screw *j*, which will then cease to press the valve *i* against the extremity of the passage *h*, so that the valve under the influence of the air compressed by the pressure of the gas in the receptacle *e*, rises and the air enters the chamber *g* from which it escapes through the passage *k;* the valve *i* is closed as soon as the liquid gas appears at the orifice of the passage *k*. The charging of the capsules thus takes place instantaneously without any loss of gas, and in entire safety, while at the same time the purity of the liquefied gas in the cylinder *a* is assured since the air contained in the passages of the apparatus and the capsules cannot enter it, but on the contrary is expelled into the atmosphere.

The apparatus presents the further advantage of being strong, extremely simple and easy to manipulate, so that it is possible to charge capsules by means thereof in safety without previous experience.

It will of course be understood that the forms and dimensions may vary, as the examples herewith presented relate only to the charging of small capsules. It is obvious that the apparatus may be adapted to various conditions, in which it is necessary to decant compressed gas from a large receptacle into a smaller receptacle of any form, the principle of the apparatus remaining the same.

I claim as my invention:

1. Apparatus for decanting liquefied gas from a container into capsules or the like, comprising a passage communicating directly with said container, a discharge valve therein and means for bringing the capsule to be charged into communication with said passage, in combination with means in connection with said passage to receive and confine the air expelled from the capsule and means to permit the escape of accumulated air from said passage.

2. Apparatus for decanting liquefied gas from a container into capsules or the like, comprising a passage communicating directly with said container and leading to a port pro-

vided with a seat for the mouth of a valved capsule, means to carry the capsule, means to press the same against said seat and means to open the passage from the said container to said capsule so as to permit the flow of the liquefied gas into said capsule, substantially as described.

3. Apparatus for decanting liquefied gas from a container into a receptacle therefor, comprising a passage communicating with said container below the level of the liquefied gas therein, provided with a discharge valve and a seat for the mouth of a receptacle to be charged, means for pressing the latter to said seat and means for opening said valve while said receptacle is so seated whereby the liquefied gas will flow under its own pressure from said container into said receptacle to be charged, substantially as described.

4. Apparatus for decanting liquefied gas from a container into a receptacle to be charged and adapted to be carried by said container, comprising a discharge passage opening into said container below the level of the liquid therein and provided with a discharge valve, a carrier for a receptacle to be charged from said container and means for bringing said receptacle into communication with said discharge passage and means for opening said discharge valve at the same time, substantially as described.

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

PIERRE GIRON.

Witnesses:

BENJAMIN BLODE,

HANSON C. COXE.