

(No Model.)

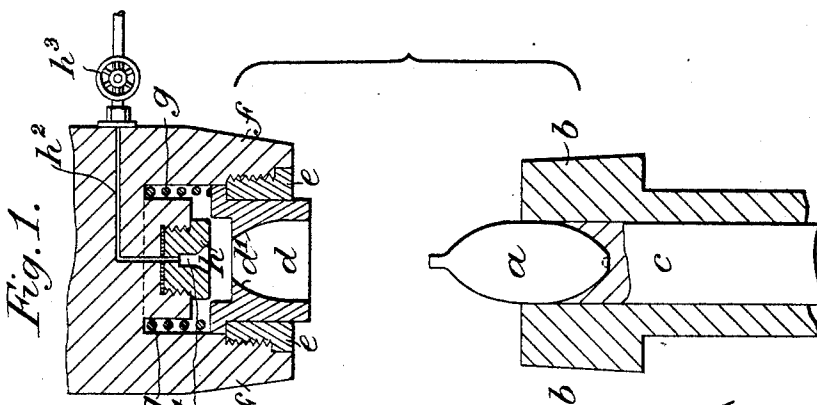
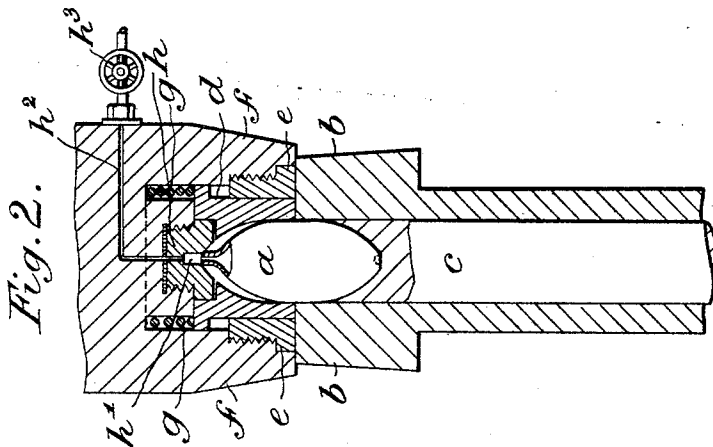
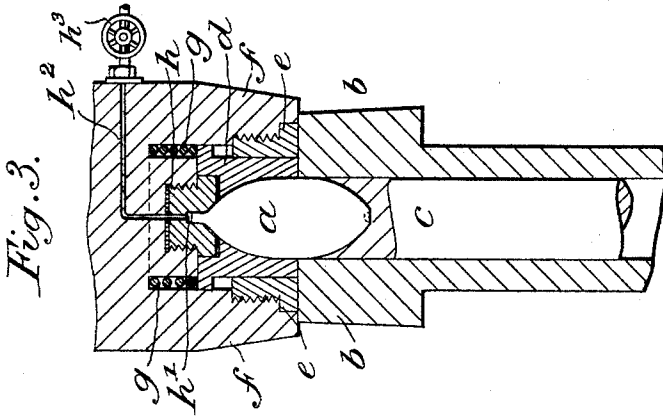
2 Sheets—Sheet 1.

E. STERNÉ.

APPARATUS FOR FILLING AND CLOSING METAL CAPSULES.

No. 586,633.

Patented July 20, 1897.



Witnesses.
Edmund P.
Nellie Callahan

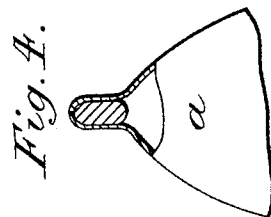
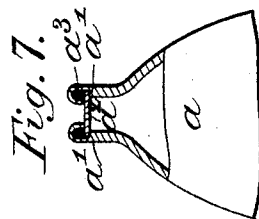
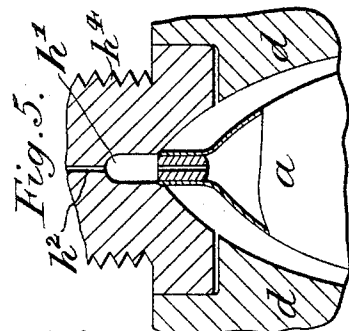
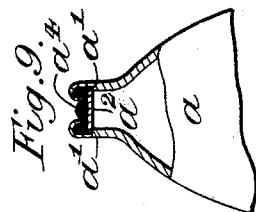
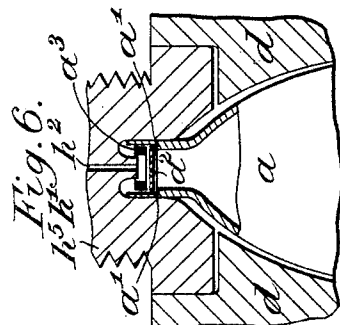
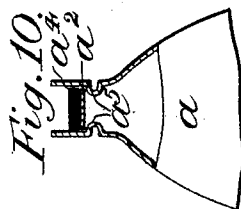
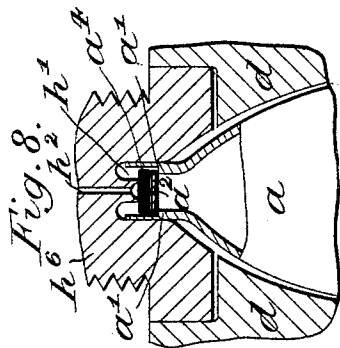
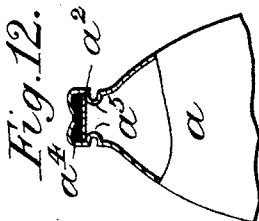
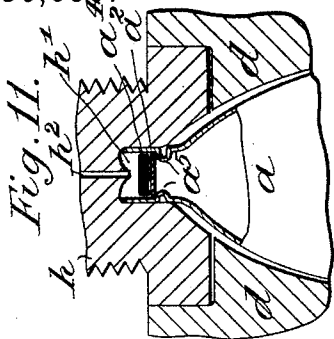
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APPARATUS FOR FILLING AND CLOSING METAL CAPSULES.

No. 586,633.

Patented July 20. 1897.



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UNITED STATES PATENT OFFICE.

EMILE STERNÉ, OF PARIS, FRANCE.

APPARATUS FOR FILLING AND CLOSING METAL CAPSULES.

SPECIFICATION forming part of Letters Patent No. 586,633, dated July 20, 1897.

Application filed April 10, 1897. Serial No. 631,537. (No model.) Patented in England June 1, 1896, No. 11,896.

To all whom it may concern:

Be it known that I, EMILE STERNÉ, a subject of the Emperor of Austria-Hungary, residing at Paris, in the Republic of France, have invented certain new and useful apparatus for filling and closing metal capsules or containers submitted to great internal pressure and having necks with small inlet-apertures, (for which I have obtained a patent in England, No. 11,896, dated June 1, 1896,) of which the following is a full, clear, and exact description.

The invention has for its object apparatus for filling and closing metal capsules or containers submitted to great internal pressure and having necks with small inlet-apertures, which may be formed direct in the substance of the neck or in or around a lining therein of a different material—such, for instance, as ebonite.

I will describe my invention by the aid of the accompanying drawings, in which—

Figures 1, 2, and 3 represent sections of apparatus for charging and closing a metal capsule or container having a fine neck with a small central inlet-aperture and showing the parts in three different positions, and Figs. 4 to 12 represent sections of various forms of capsule-necks to which my invention is applicable and of dies to act upon the same.

Referring to Figs. 1, 2, and 3, I place a capsule *a* in a die *b*, formed with an aperture fitting the capsule and fitted with a plunger *c*, formed on its end to fit the base of the capsule. In connection with this die *b* is a die *d*, which is movable within an adjustable sleeve *e*, screwing into the framing *f*, and is pressed outward by a spring *g*. The dies *b* and *d* are separated from each other a sufficient distance, as shown at Fig. 1, to enable the capsule *a* to be placed within the die *b*. The die *b*, with its plunger *c*, is then moved into contact with the die *d*, which it moves, against the pressure of the spring *g*, flush with the face of the sleeve *e*, as shown at Fig. 2, when the nozzle of the capsule will be pressed against the mouth of the small recess *h'* in the fixed die *h* with sufficient force to make a tight joint. The die *h* fits a recess in the die *d*, and its recess *h'* communicates by a passage *h²* with the supply of gas or fluid under high pressure. Then by opening an inlet-valve placed in a suitable position, such as *h³*, the

compressed gas or fluid is caused to pass through the neck of the capsule and fill the latter. The said valve is then closed and the plunger *c* in the die *b* is moved outward toward the die *d*, thereby forcing the neck of the capsule into the small recess *h'* of the fixed die *h*, as shown at Fig. 3, which recess, being smaller than the original size of the neck of the capsule, compresses or crushes the neck and the lining material, if any, so as to effectually close the inlet-aperture thereof. The die *b* and plunger *c* are then separated from the die *d*, when the spiral spring *g* or other suitable means will press the die *d* outward from the sleeve *e*, whereby said die *d*, which is formed with a shoulder *d'*, fitting the shoulder of the capsule *a*, will remove the closed-up neck of the capsule from the closing-recess *h'* in the die *h*, thereby freeing the capsule and causing it to fall out. It will be evident that the parts *e f h* may be caused to move to close the neck of the capsule instead of moving the plunger *c* for said purpose.

In the capsule and apparatus represented at Figs. 1, 2, and 3 the neck of the capsule is compressed in a merely cylindrical direction, but other forms of neck and of die *h* may be employed.

In Fig. 4 the neck of the capsule *a* is shown turned inward at its end, so that in addition to being compressed radially to its axis its material is turned over that in which the aperture is formed. This action is obtained by means of a die *h⁴*, formed as shown at Fig. 5.

In Fig. 6 the capsule *a* has a ledge *a'* formed in its neck. A metal plate *a²*, slightly smaller in diameter than the upper part of the neck, is placed on said ledge, and a ring of ebonite or other suitable material *a³* is placed on the plate. A die *h⁵*, such as that shown in said figure, is employed in connection with such a form of capsule-neck, and in charging the capsule the latter has the upper end of the neck pressed firmly enough against the said die to secure a tight joint therewith and at the same time leave a free passage from the gas-inlet passage *h²* to and around the plate *a²* and ring *a³*, whence the gas passes into the capsule *a*. When the latter is charged, it is moved, as in Figs. 1, 2, and 3, so as to force its neck fully into the die *h⁵*, whereby the upper part of the neck will be turned over the

ring a^3 and tightly compress the same between it and the plate a^2 , as shown at Fig. 7.

In Fig. 8 the neck of the capsule a is of similar form to that shown at Fig. 6; but instead of employing a ring a^3 a disk a^4 is used. This arrangement is employed in connection with the die h^6 shown, and the top of the neck is forced over onto the disk a^4 and compresses the same between it and the plate a^2 , as shown at Fig. 9.

In Fig. 10 a capsule a is shown in which a contraction a^5 is made in the neck to serve as a seat for a plate a^2 , on which a disk a^4 is placed, and the upper part of the neck is turned and compressed over such disk or ring by the same construction of die h^6 as that shown at Fig. 8.

If desired, capsules having a disk a^4 placed on a plate a^2 , supported on a ledge in the neck, as shown at Figs. 8 and 10, may have the upper part of the neck turned over by a die h^7 of the shape shown at Fig. 11, so as to cover or inclose the disk a^4 completely, or nearly so, as shown at Fig. 12.

I would here remark that the above several forms of necks for capsules are shown as examples only, but that my invention is also applicable to capsules having other forms of necks, so long as the neck of the capsule is pressed firmly against a die to secure a tight joint for the charging of the capsule and a further motion of the capsule into said die effects the closing thereof.

If desired, other means may be employed for ejecting the filled and closed capsule.

It will be evident that various modifications may be made in the construction and arrangement of the various parts without departing from the peculiar character of my invention.

Having fully described my invention, what I desire to claim and secure by Letters Patent is—

1. In apparatus for filling and closing metal

capsules or containers having small inlet-apertures, the combination of a die to receive the body of the capsule, a plunger in said die to fit the base of the capsule, a spring-actuated die to receive the shoulder of the capsule, a die fixed in the frame and having a recess somewhat smaller than the neck of the capsule, a passage connecting said last-mentioned recess with the supply of gas or fluid under pressure, and a valve to open and close the conduit of the compressed gas or fluid, the whole being operated so as first to press the neck of the capsule against the mouth of the small recess in the die connected with the supply of compressed gas or fluid for the filling operation, then to force the neck of the capsule into the said recess to close the aperture in said neck and finally to eject the filled and closed capsule, substantially as herein set forth.

2. In apparatus for filling and closing metal capsules or containers having small inlet-apertures, the combination of dies to receive the capsule, a recess in one of such dies communicating by a passage with the supply of compressed gas or fluid and somewhat smaller in diameter than the neck of the capsule, means for pressing the neck of the capsule against the mouth of said recess with sufficient force to secure a tight joint during the filling operation, means for opening and closing the passage for the compressed gas or fluid, means for closing the neck of the filled capsule or container by forcing it into the recess of the die communicating with the supply of compressed gas or fluid; and means for liberating the filled and closed capsule or container, substantially as herein set forth.

EMILE STERNÉ.

Witnesses:

THEODORE STERNÉ,
EDWARD P. MACLEAN.