No. 808,833. PATENTED JAN. 2, 1906.

E. GOLTSTEIN.

BOTTLE SEALING MECHANISM.

APPLICATION FILED FEB. 26, 1902.

2 SHEETS—SHEET 1.

Fig. 1.

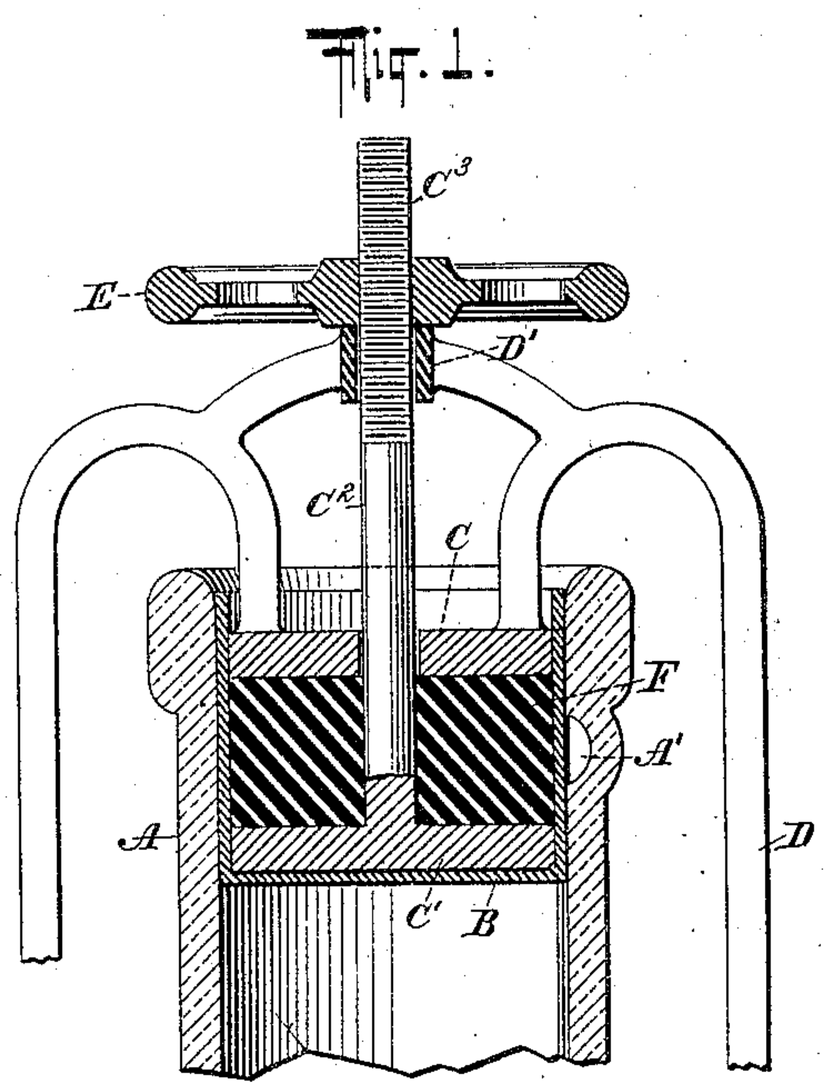


Fig. 2.

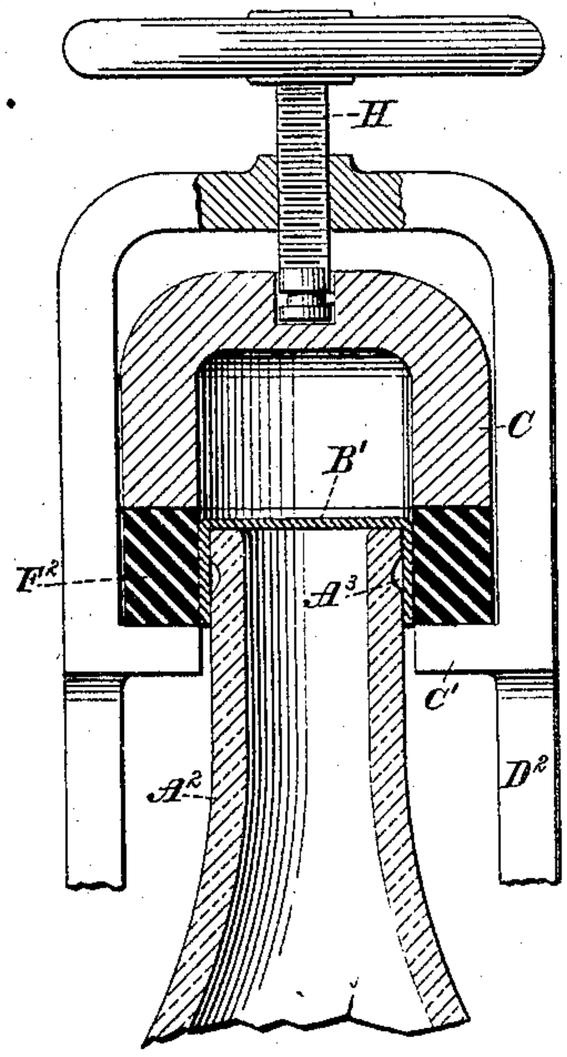


Fig. 3.

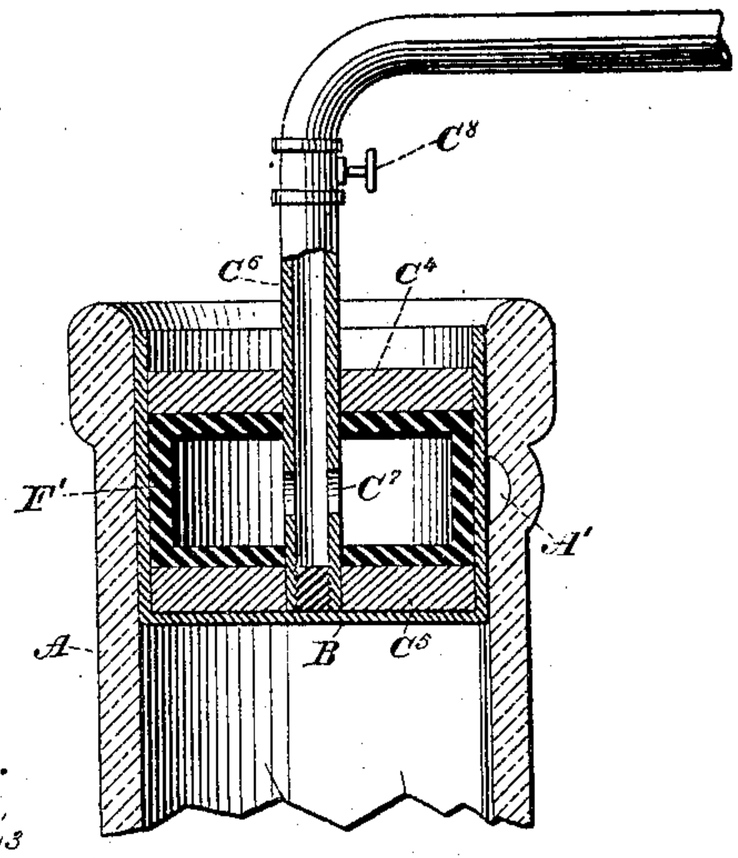
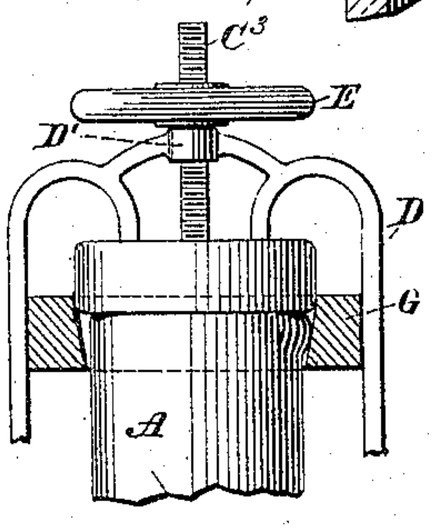


Fig. 4.



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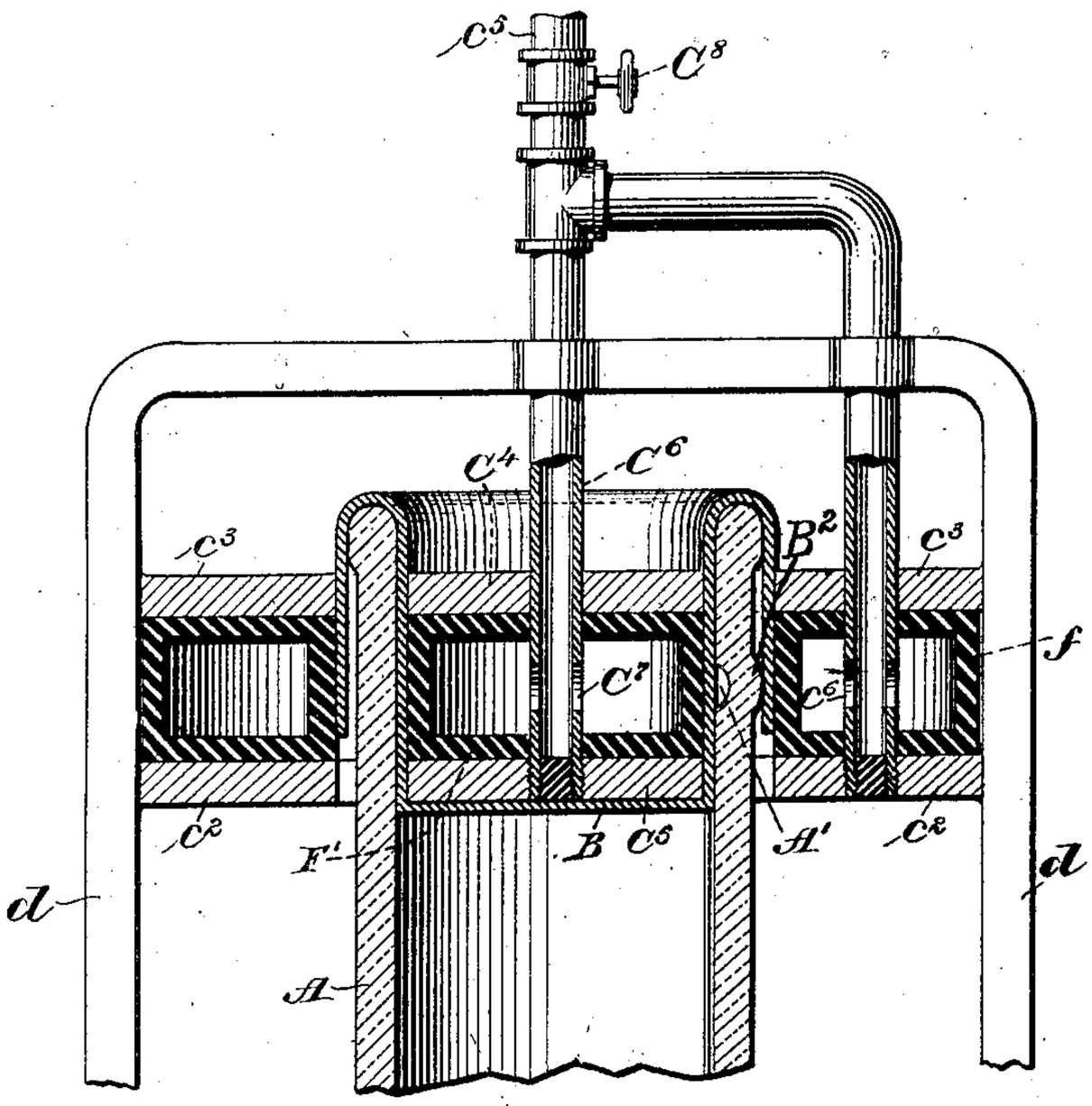
2 SHEETS—SHEET 2.

Fig. 5.



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UNITED STATES PATENT OFFICE.

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BOTTLE-SEALING MECHANISM.

No. 808,833. Specification of Letters Patent. Patented Jan. 2, 1906.

Application filed February 26, 1902. Serial No. 95,649.

To all whom it may concern:

Be it known that I, EWALD GOLTSTEIN, a subject of the King of Prussia, German Emperor, residing at the city of Cologne, Kingdom of Prussia, Empire of Germany, have invented certain new and useful Improvements in Bottle-Sealing Mechanisms, of which the following is a specification.

My invention relates to mechanism for sealing bottles, and has for its object to provide improved means for firmly connecting caps made of metal or other suitable material with the neck of a bottle or other receptacle.

My improvement has for its particular object to press the sides of the cap at every point firmly in contact with the bottle-neck, so that the cap will conform closely to the exact shape of the neck and mold itself to all irregularities of the glass.

Another feature of my invention is to provide means for holding or backing the bottle-neck against the pressure of the mechanism which drives or forces the cap into firm contact with the bottle.

The invention will be fully described hereinafter and the features of novelty pointed out in the appended claim.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a sectional elevation showing part of a bottle-neck with a cap in position thereon and in connection with mechanism for pressing the cap against the bottle upon the inside. Fig. 2 is a similar view illustrating means for applying a cap on the outside of the bottle. Fig. 3 is another sectional elevation showing a different mechanism for applying a cap to the inside of the bottle-neck. Fig. 4 is an elevation of a bottle in connection with mechanism, such as shown in Fig. 1, with the addition of means for bracing or backing the bottle-neck against pressure; and Fig. 5 is a sectional elevation of another form of my invention,

Figs. 1, 3, and 4 illustrate the application of my invention to the sealing of bottles by means of an internal sealing-cap made of suitable sufficiently-yielding material, such as tin, lead, or aluminium. A designates the bottle-neck, and A′ is a depression, groove, or irregularity formed specially in the manufacture of the bottle; but I desire it to be understood that the inner surface of ordinary bottles almost always shows some irregularities which are sufficient to secure, in a measure at least, the advantages presently to be stated. B is the cap or cup which at first fits loosely into the bottle-neck and is then to be pressed tightly against the glass, so as to shape or mold itself in exact conformity with the surface of the bottle-neck. For this purpose I may provide mechanism, such as indicated in Figs. 1 and 4, which consists, essentially, of two heads or disks, the distance between which may be varied, and an expansible body—for instance, vulcanized rubber—held between said heads. In the specific construction illustrated by said Figs. 1 and 4 one of the heads C may be rigidly secured to the stationary frame D, which may be connected with the bottle-support, while the other head C′ is provided with a stem C^2, arranged to slide through the upper head C and having a screw-threaded portion C^3. The latter passes through a bearing D′ in the frame D and is engaged by a wheel or nut E, the rotation of which will draw the lower head C′ upward, thus exerting pressure on the expansible body F. Inasmuch as this body is held against expanding up or down by the rigid heads C C′, it is compelled to spread sidewise or circumferentially, thus pressing the cap B tightly against the inner surface of the bottle-neck and into all irregularities thereof, such as the recess A′. The rubber body F practically does not alter its volume, but only its shape, during this operation, and thus the cap B is pressed very forcibly against the bottle. The cap is then very firmly held in place, as it does not simply adhere to the glass by friction, but is actually pressed into locking engagement with all the depressions and irregularities of the bottle-neck. The cap therefore cannot be removed bodily and replaced after the contents of the bottle have been tampered with; but it becomes necessary to break or tear the cap in order to open the bottle, and thus protection is secured against fraudulent refilling. The cap is held in place very strongly and is thus adapted to reliably seal bottles containing carbonated beverages and the like.

In Fig. 3 the two heads C^4 C^5 are rigidly connected with each other, being both secured to a stem C^6, which is hollow, so that it may serve as a pipe for supplying compressed air, oil, or any other suitable medium and has one or more apertures C^7 leading into the hollow expansible body F′. In this construction also the heads C^4 C^5 are rigid, so as to prevent an upward or downward expan-

sion of the body F′ and to compel it to spread peripherally upon inflation. The operation of this mechanism will be obvious without further explanation, and the advantages are the same as above described.

The outwardly-acting pressure is so strong that there is in some cases danger of breaking the bottle-neck. To guard against this, I may employ a rigid or preferably an elastic backing engaging the bottle upon the outside, as indicated at G in Fig. 4, so that the glass will be backed or braced against the pressure exerted upon it on the inside; but when the backing G is elastic it is engaged by rigid surfaces, such as a portion of the frame D, so that ultimately the thrust exerted by the pressure device and transmitted radially through the neck of the bottle is received by a rigid backing.

When the cap is to be applied externally—as, for instance, the cap B′, (shown in Fig. 2,)—the two heads or holders *c c′*, between which the expansible body F^2 is received, are of a greater diameter than the bottle-neck A^2, and the body F^2 is annular and is held against expansion not only at the top and at the bottom, but at the outside as well, so that it can expand only inward. The lower head *c′* may form part of or be attached to the stationary frame D^2, which has a screw-threaded bearing D^3 for the screw-spindle H, having a swivel connection with the upper head *c* and serving to force the heads together to expand the body F^2. The cap B′ is thus pressed tightly against the bottle-neck A^2 and made to follow closely the irregularities thereof—as, for instance, a groove A^3.

The mechanism shown in Fig. 2 may be used instead of that represented in Fig. 4 for the purpose of bracing the bottle against the pressure applied internally. In fact, in the preferred form of my invention when the stopper or cap is applied internally I would employ mechanism combining both features—that is, devices for exerting pressure outwardly on the cap and at the same time exerting pressure inwardly upon the outside of the bottle-neck. Such a construction is shown in Fig. 5, where I have combined mechanism of the character illustrated by Fig. 3 with an exterior pressure-exerting mechanism of the same character—that is, the outer pressure-exerting mechanism comprises two heads or holders c^2 c^3, having a hollow expansible body *f* between them, this body being annular and being held against expansion not only at the top and at the bottom, but, further, at the outside, by a backing *d*, which performs the same function relatively to the pressure-exerting body *f* as the frame D^2 in Fig. 2. A branch of the pipe c^5 may lead from the stem C^6 to the interior of the expansible body *f*, being provided with one or more apertures c^8 within said body. It will be understood that in this construction each of the pressure-exerting devices forms a backing against the action of the other pressure-exerting device, such a mechanism combining two pressure-exerting devices, one acting upon the inside of the bottle and the other upon the outside thereof, may also be employed to apply a cap on the inside of the bottle, as well as upon the outside, as when the upper portion of the cap B (shown in Fig. 3) is extended over the mouth of the bottle, as indicated at B^2 in Fig. 5. In this case as pressure would be exerted inward and outward at the same time each of the pressing mechanisms would form a bracing device against the action of the other and a separate backing would be dispensed with.

While I have described several forms of my invention with considerable detail, I desire it to be understood that in various respects these constructions may be modified without departing from the nature of my invention as long as they embody the features of the appended claim. I desire it to be distinctly understood that the use of screws for exerting pressure has been shown only as being probably the simplest mechanism for effecting the purpose in view; but I do not wish to restrict myself to this, and, in fact, I may just as well, or even preferably, move one of the heads or both or distend the expansible body directly by hydraulic-pressure mechanism, the details of which are familiar to anybody skilled in the art. In each case the pressure to which the rubber or like expansible body is subjected is very considerable, and the cap B or B′ is not only pressed transversely against the bottle-neck, but pulled or stretched lengthwise thereof. This prevents the formation of folds on the cap.

What I consider as my invention, and desire to secure by Letters Patent, is—

A bottle-sealing mechanism, comprising an inner and outer member spaced from each other to receive a bottle-neck between them, each of said members having two spaced heads or plates forming spaces open entirely only on the side near the bottle-neck, the outer member also having a backing extending from the outer edge of one head to the outer edge of the other head, and expansible bodies located in said spaces, and adapted to expand toward each other, and therefore toward the bottle-neck.

EWALD GOLTSTEIN.

Witnesses:
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CARL SCHMITT.