

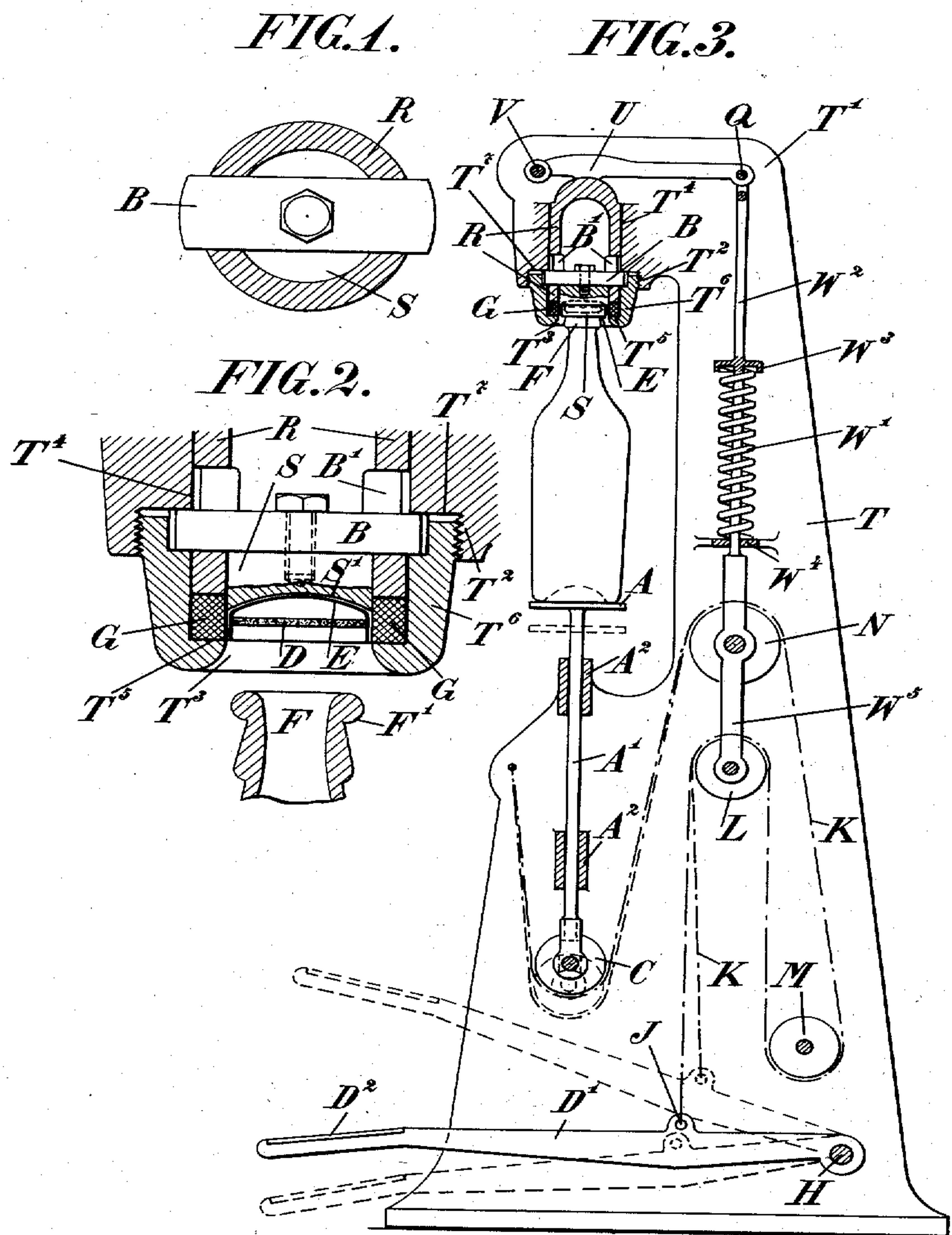
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PATENTED FEB. 13, 1906.

E. GOLTSTEIN.

APPARATUS FOR CLOSING BOTTLES BY MEANS OF METAL CAPSULES.

APPLICATION FILED MAY 23, 1904.



Witnesses:
Samuel Sundry.
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UNITED STATES PATENT OFFICE.

EWALD GOLTSTEIN, OF COLOGNE, GERMANY.

APPARATUS FOR CLOSING BOTTLES BY MEANS OF METAL CAPSULES.

No. 812,648.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed May 23, 1904. Serial No. 209,404.

To all whom it may concern:

Be it known that I, EWALD GOLTSTEIN, engineer, a subject of the King of Prussia, German Emperor, residing at 111 Lothringerstrasse, Cologne, Kingdom of Prussia, Empire of Germany, have invented certain new and useful Improvements in Apparatus for Closing Bottles by Means of Metal Capsules, of which the following is a specification.

10 This invention relates to an apparatus or mechanism for applying metal capsules to bottles and the like; and the object of the same is to overcome numerous disadvantages incident to apparatuses and machines of this
15 type as heretofore constructed.

Various machines have been organized for applying capsules to the necks of bottles, both internally and externally. In the class of machines wherein the capsule or closing
20 device is inserted in the bottle-neck a comparatively high pressure is exerted by the punching means on a direct-acting yielding element coöperating with the capsule. This pressure is so great that ordinarily many of
25 the usual and otherwise preferable washer materials cannot be employed in connection with the capsule by reason of their fragility and incapability to withstand this high pressure. The transmission of this high pressure
30 to the bottle neck and head may be avoided if the support or bearing counteracting the pressure be not held against the bottle-mouth, but against a frame serving as a bottle-support or against a base-rest, as the
35 washer must always have some pressure exerted thereagainst. To properly apply it to the bottle head or neck, an organization of elements or a device is necessary by means of which the bottle may be pressed up against
40 the washer by a suitably-regulated force. In other words, two forces differing in extent must be brought into play with respect to the bottle to which the capsule is to be applied and the latter, and in the present apparatus
45 these two opposing forces are produced by a single application of power in such manner that both forces may be brought into the correct proportion to one another as regards time and extent.

50 In the drawings, Figure 1 is a horizontal section of a portion of the apparatus, showing the bridge-piece for coöperation with the upper tubular support. Fig. 2 is an enlarged detail sectional view of a portion of the apparatus, showing a bottle head or neck in sec-

tion positioned relatively thereto. Fig. 3 illustrates a complete machine, partly in elevation and partly in section.

Similar characters of reference are employed to indicate corresponding parts in the
60 several views.

The frame T of the apparatus may be of any suitable material and dimensions and of such shape as to accommodate the application thereto of the mechanism, which will be
65 hereinafter more particularly specified. This frame is supported by a suitable base and is of such height as to be convenient for control by an operator. The upper part of the frame has a head or support T', which is suitably
70 chambered or recessed and is formed with a depending lip T², surrounding a mouth T³, to receive the upper terminal or head of a bottle-neck. In the lower part of the frame a
75 treadle or foot-power lever D' is movably held on a fulcrum-pin or analogous device H and at its free terminal is provided with a properly-extended pressure-surface D². A
80 bottle support or disk A has a depending stem A' vertically movable in guides A², forming part of or secured to the frame at different elevations and both above the
85 treadle D'. In the lower extremity of the stem A' a pulley C is mounted, and in the rear lower portion of the frame at a distance from the stem A' and said pulley C a guide-
90 pulley M is held in one position with respect to the frame. A plunger W² is also movably held by the frame and an intermediate stop-collar or analogous device W³, between which
95 and a guide W⁴, through which the plunger has vertical movement, a spring W' is interposed and surrounds the plunger to serve as a cushion means. The lower extremity W⁵ of
100 the plunger is enlarged and carries pulleys N and L, the pulley L being in the lower extremity of said extremity W⁵ and of less diameter than the pulley N. The pulleys C, L, and M are approximately of the same diameter; but, as before noted, the pulley M has a
105 fixed position of rotation, whereas the pulleys C, N, and L are shifted vertically. A belt, cord, chain, or other analogous device K is terminally attached to an eye J at an intermediate point on the treadle D' and from
110 said eye passes over the pulley L downwardly under the pulley M, then up over the pulley N, and down under the pulley C and has its opposite terminal fixed to the frame, as clearly shown. The upper end of the plun-

ger W^2 is connected to the rear end of a pressure-lever U , having its front end engaging a fulcrum V .

The chamber or recess T^4 in the head T^1 and with which the mouth communicates contains the mechanism directly cooperating with the capsule and washer and the upper end or head of the bottle-neck. The lower terminal of the lip T^2 is regularly rounded into the mouth T^3 , and the said mouth is of less diameter than the chamber T^4 , and by this means a lower annular shoulder T^5 is formed adjacent to the mouth. On the shoulder T^5 is disposed an annular elastic pressure element or gasket G , having such normal thickness that its inner side will be in vertical alignment or coincide with the inner reduced portion of the said mouth. The lower or depending extremity of the head T^1 is preferably formed as a separate cup T^6 , as clearly shown by Fig. 2, and removably secured to the remaining part of the head by external screw-threads at its upper end, the latter being inserted in a seat T^7 in the head T^1 . This cup T^6 is easily removable and applicable to the neck T^2 and provides for the easy disposition of the several devices carried by the head in the latter and the ready replacement of said parts when found necessary.

Fixed in the cup T^6 is a bridge B , and attached to the latter and depending into the lower portion of the chamber T^4 is a fixed stamp or abutment S , having a lower concaved seat S' . This fixed stamp or punch has its lower terminal below the upper edge of the elastic compression element or gasket G , and engaging the said upper edge of the element or gasket is a displaceable tubular stem or punch R , having opposite slots B' to permit operation of the said stamp or punch with respect to the bridge B . The displaceable tubular stem or punch R projects upwardly and the head thereof is always in contact with an intermediate portion of the pressure-lever U .

It will be observed that the compressible element or gasket G lies embedded between fixed lower and outer walls and partially by an inner wall through the medium of the dependence of the fixed stamp or abutment S , and consequently when the displaceable stamp or punch R is forced down it causes the lower inner portion of the compressible element or gasket to be forced inwardly and regularly bend the lower edge of the capsule properly around the bottle-neck and over the head or mouth of the latter.

The bottle to be capped is placed on the disk or support A , and gradual downward pressure is applied to the treadle D' . This gradual downward pressure is exerted through the belt, cord, chain, or analogous device K , over the pulleys M , N , L , and C , and owing to the fixed position of the pulley M the stem A' to which the disk or support A is secured is gradually elevated and the bottle-neck di-

rected toward the mouth T^3 . The resistance of the spring W' is such that the elevating movement of the bottle to be capped through the operation just described does not affect the normal position of the pulleys N and L , as shown by Fig. 3, but as soon as the mouth or head end of the bottle-neck enters the mouth T^3 and continues upwardly against the washer D and the capsule E , which latter parts will be preliminarily disposed in proper position, as shown, and a resistance is met to the further upward movement of the bottle-neck the plunger W^2 is drawn downwardly, because under such conditions the spring W' or analogous device ceases to be an obstruction to the movement of the plunger, and by such downward movement of the plunger the pressure-lever U is also operated and exerts a gradual downward pressure on the displaceable stamp or punch R , and at the same time the bottle is pushed up firmly, and the upper head or mouth end of the neck F , as shown by Fig. 2, and the top bead F'' will be disposed fully within the mouth T^3 and the lower extremity of the chamber T^4 , the edge or rim of the capsule depending over or covering the bead F' . Hence the inward-expanding pressure exerted against the compressing element or gasket G by the operation of the stamp or punch R will bend the rim of the capsule downwardly over the bead F' . The washer D during such operation will be firmly secured on the upper edge of the head or mouth of the bottle-neck and when pressure force is withdrawn from the treadle D' the parts will be restored to normal position and at the same time the bottle-neck will be released from the capsule-applying mechanism carried by the head T^1 . The forces rising from the operation of the mechanism in connection with the treadle D' assume the following values: If the resistance in the spring W or analogous device amounts to one hundred kilograms according to the pulley arrangement, the pull on the cord K may rise to twenty-five kilograms before a movement of the pressure-lever U is effected. If the position of the point of pressure of the said lever be selected relatively to the point of rotation of the fulcrum V and the point of connection Q in such a way that $UV:QV=1:5$ the pressure exerted on the displaceable punch or stamp R amounts to five ($4z-100$) kilograms, z expressing the tensions of the cord, chain, or analogous device K in kilograms. The pressure of the bottle against the stamp or abutment S , and thus also the pressure on the washer D , amounts, on the other hand, only to two z kilograms. In order to fix a capsule of twenty-eight millimeters diameter, a tension, for instance, in the cord, chain, or analogous device K of about one hundred kilograms is necessary. The bottle is then operated with a pressure of about two hundred kilograms against the fixed stamp or abutment S , while the pressure trans-

mitted to the displaceable punch R and serving to compress the element or gasket G amounts to fifteen hundred kilograms.

Having thus described the invention, what is claimed is—

1. In an apparatus for closing bottles by means of metal capsules and washers, the combination of a vertically-movable bottle-holding means, a fixed stamp or abutment against which the capsule and washer are placed, a compressible elastic element disposed around the lower portion of the fixed stamp or abutment, a displaceable punch movable over and around the stamp or abutment and engaging the compressible element, a lever for operating both the bottle-holding means and the displaceable punch, a flexible connection and pulleys interposed between the lever and the bottle-holding means and punch, and means for preventing a premature operation of the punch.

2. In an apparatus for closing bottles by means of metal capsules and disks, the combination of a vertically-movable bottle-holding means, a fixed stamp or abutment against which the capsule and washer are placed, a compressible elastic element having a portion thereof below the stamp or abutment and exerting an inward pressure when operated against the capsule-rim, a displaceable punch movable over the stamp and abutment and in engagement with the compressible element, and mechanism for operating the bottle-holding means and displaceable punch in timed relation.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EWALD GOLSTEIN.

Witnesses:

WILHELM LEHRKE,
JULIUS SECKEL.

Correction in Letters Patent No. 812,648.

It is hereby certified that the name of the patentee in Letters Patent No. 812,648, granted February 13, 1906, for an improvement in "Apparatus for Closing Bottles by Means of Metal Capsules," was erroneously printed "Ewald Golstein" at the end of the specification, whereas the said name should have been printed *Ewald Goltstein*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 10th day of April, A. D., 1906.

[SEAL.]

F. I. ALLEN,
Commissioner of Patents.

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