No. 860,513. PATENTED JULY 16, 1907.

S. W. BALCH.

MACHINE FOR APPLYING CAPS TO BOTTLES.

APPLICATION FILED SEPT. 2, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

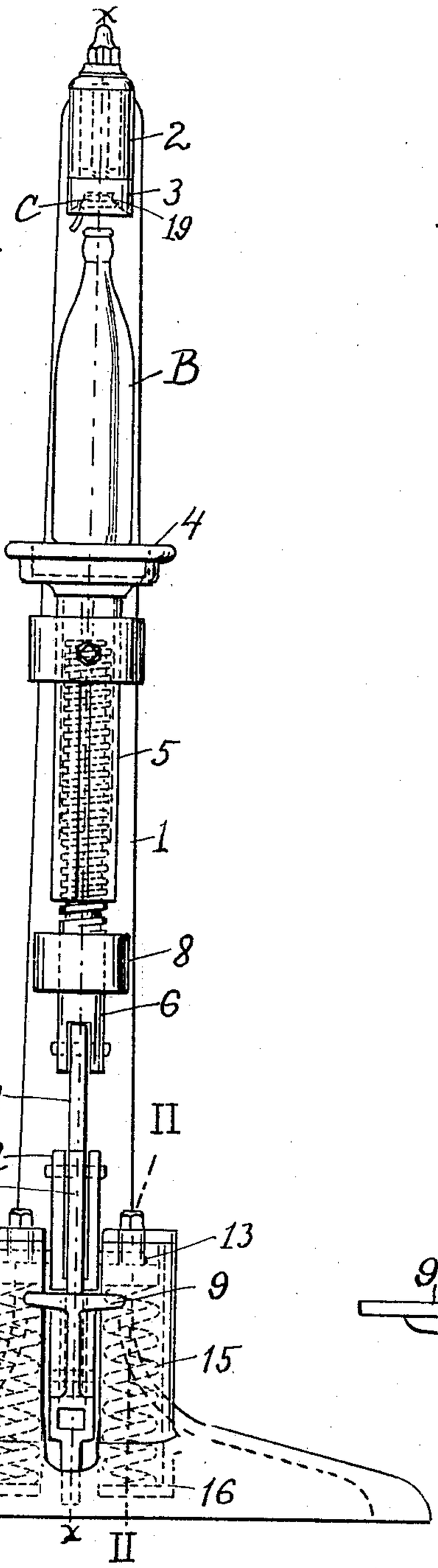
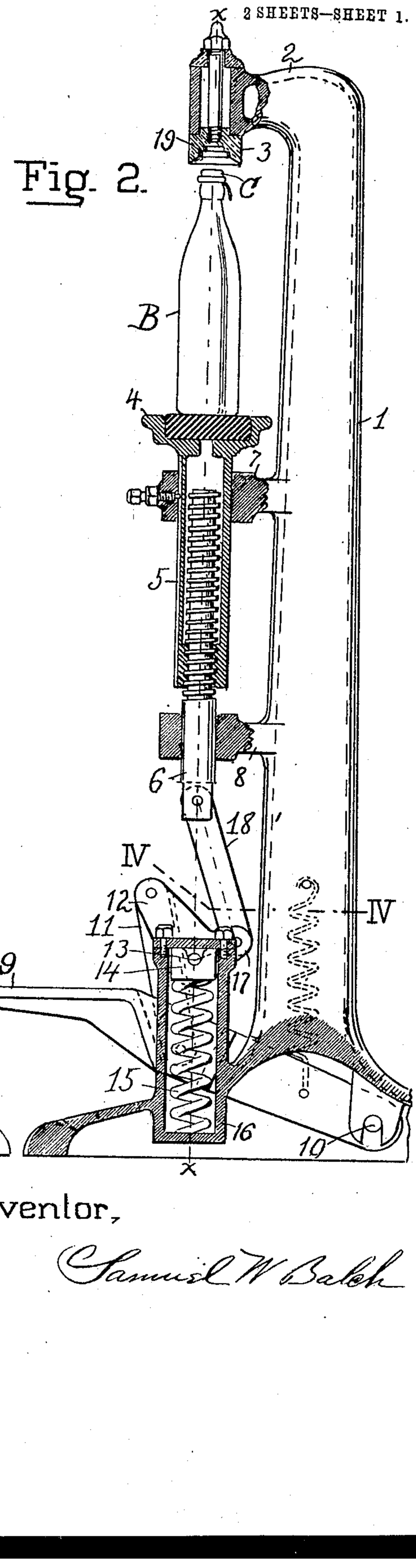


Fig. 2.



Witnesses:
Frederick Recht
Oscar H. Goodell

Inventor,
Samuel W. Balch

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Fig. 3.

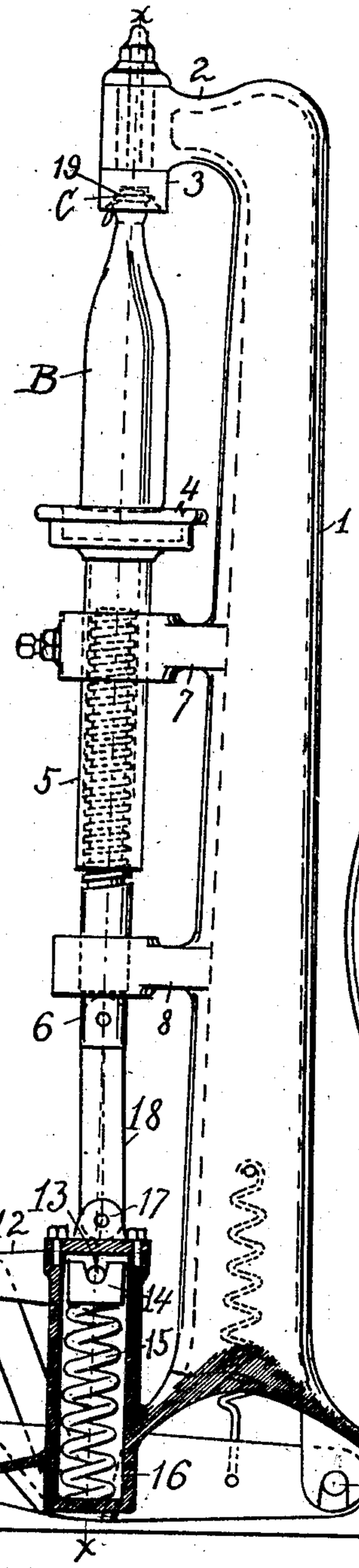
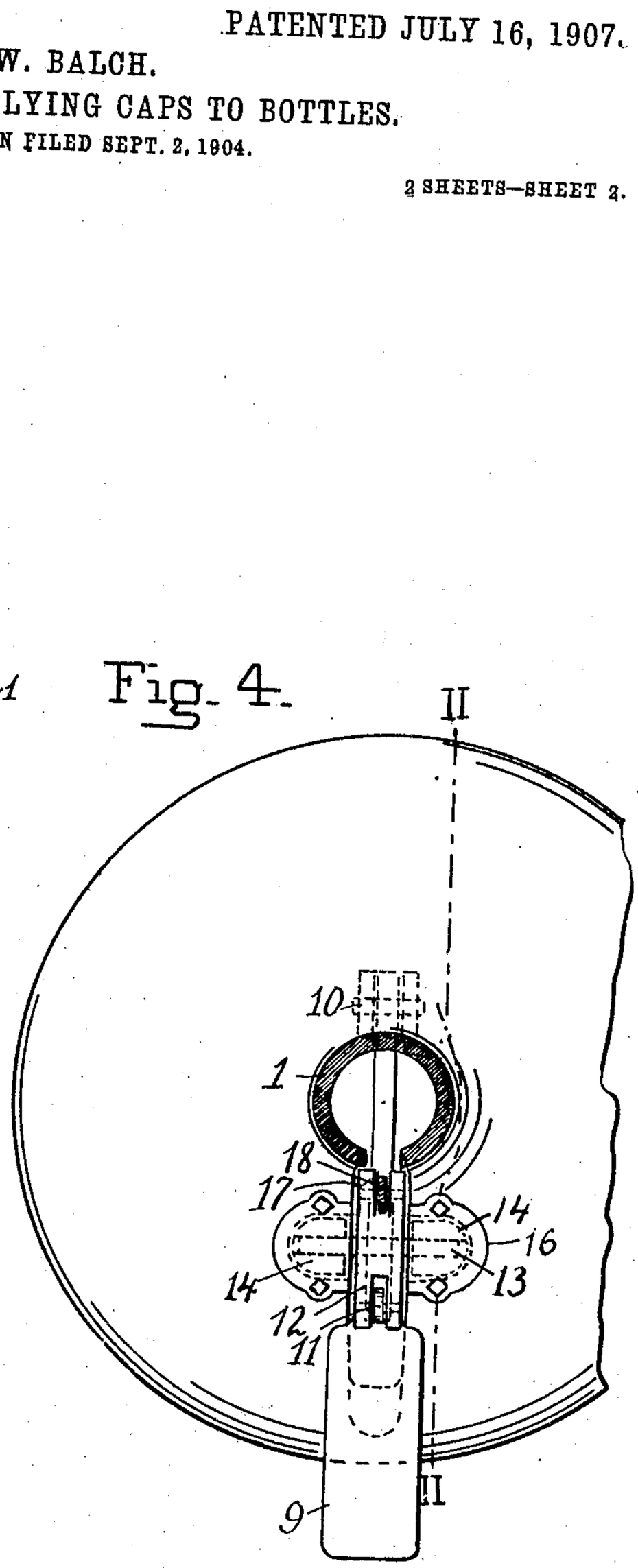


Fig. 4.



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UNITED STATES PATENT OFFICE.

SAMUEL W. BALCH, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO FREDERICK RECHT, OF BROOKLYN, NEW YORK.

MACHINE FOR APPLYING CAPS TO BOTTLES.

No. 860,513. Specification of Letters Patent. Patented July 16, 1907.

Application filed September 2, 1904. Serial No. 223,058.

To all whom it may concern:

Be it known that I, SAMUEL W. BALCH, a citizen of the United States of America, and a resident of Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Machines for Applying Caps to Bottles, of which the following is a specification.

This invention relates to the construction of a machine for applying caps to bottles wherein an essential part of the operation consists in placing the cap and bottle between a pressure-applying head and table, and bringing the two toward each other in the direction of the axis of the bottle with considerable force for the purpose of effecting one or more of the operations involved in closing and locking the cap on the bottle. In such machines it is necessary that the table and head be normally separated with considerable clearance to permit of the ready insertion between them of a cap and bottle. Hence, but little force is required to lift the table and bottle in taking up the clearance, but at the extreme end of the movement great force is required for a comparatively short distance of movement. A means of power transmission is therefore desirable in which the mechanical advantage of transmission mechanism between the source of power and the table of the machine varies through wide limits and is very great at the end of its movement. For this purpose a toggle is provided and so arranged that the links of the toggle will be brought into substantially a right line under the table when the limit of movement is reached. In practical operation of such a machine it is necessary to cap bottles which vary slightly in length without special adjustment for each bottle, and one object of my invention is to enable this to be done. It is also desirable that the toggle links should be brought substantially into line in order that the machine may exert the required power irrespective of the ordinary variation in bottle lengths. One object of my invention is therefore to provide an elastic abutment for the toggle so that whatever variation there may be in bottle lengths will be compensated for at this abutment. By so locating this abutment the springs comprising it can be disposed at the sides of other mechanism which is in the axis of the machine and considerable saving effected in the required length for the machine.

In the accompanying two sheets of drawings, which form a part of this application Figure 1 is a front elevation, drawn to a reduced scale, of a foot-power machine embodying my invention, in which a cap is shown in dotted lines in the pressure-applying head and a bottle is shown on the table. Fig. 2 is a side elevation of the machine with the pressure-applying head and table in section along the axial line of the machine, and the base of the machine in section on the line II—II of Figs. 1 and 4, with a capped bottle on the table. Fig. 3 is a similar side elevation showing the operating mechanism in the position to which it is brought in applying the cap to the bottle. Fig. 4 is a horizontal section on the line IV—IV of Fig. 2 showing the base of the machine.

This invention is illustrated in connection with a machine which has been particularly devised for applying a bottle-sealing cap C, such as are set forth in United States Letters-Patent to Frederick Recht, No. 646,627, dated April 3, 1900, to a bottle B with an outwardly projecting lip around the mouth thereof.

A column 1 has a forwardly projecting arm 2 which carries a pressure-applying or machine head 3, suitably constructed to act upon the cap, apply it to the mouth of the bottle, compress the sealing disk between the cap and bottle-mouth, and effect a locking engagement between the cap and bottle upon the application of pressure in the direction of the bottle axis x—x between the pressure-applying head and a table 4 which underlies the bottle in the axis of the machine. The table surmounts a two-part shank, one part 5 of which is a part of the table casting, and the other part 6 of which is threaded or screwed therein. By screwing the one part on the other, the height of the table may be adjusted to suit different lengths of bottles. The two-part shank is guided by arms 7 8, which project from the column. The actuating mechanism consists of a foot-treadle 9 which is fulcrumed at 10 to lugs cast on the underside of the base of the machine. Midway of the treadle is a mortise in which the lower end of a link 11 is pinned. The upper end of this link is pinned to the forked arm 12 of a bent lever. The fulcrum of this bent lever is a pin 13, the ends of which rest on two pillow-blocks 14. The pillow-blocks are supported by springs 15, and lie in two vertical spring-pockets 16 which are cast in the base of the column. The pockets lie on opposite sides of the bent lever and the axis of the machine. The springs are strongly compressed and normally force the pillow-blocks against the tops of the pockets by which they are held under an initial strain when the mechanism is otherwise relaxed. The other arm 17 of the bent lever, also forked, has pinned thereto the lower end of a link 18, the upper end of which is pinned to the lower part of the shank of the table. This arm and link form a toggle which is straightened under the table by the depression of the treadle. The springs serve as an elastic abutment for the toggle which yields when the toggle is straightened to allow for slight variations in the height of bottles from the height for which the table may have been adjusted. Depression of the treadle with a cap and bottle in place lifts the table and forces the cap and bottle against

the pressure-applying head and thereby compresses the sealing disk of the cap between the cap and bottle-mouth and then bends the bead inwardly by a continuation of the axial movement and pressure applied to the bead of the cap by an annular bearing face 19 formed in the pressure-applying head and against which the bead of the cap rests.

The construction of the pressure-applying head is not specifically claimed herein by me as I concede this feature to be the invention of Frederick Recht, who executes an application for patent on this feature, of even date with the date of execution of this application, which was filed September 2, 1904, and received Sr. No. 223,088, and in the claims herein made by me I do not limit myself to any particular form of pressure-applying head, or condition that it shall perform both of the functions herein recited of forcing the cap into sealing engagement and bending the bead into locking engagement.

What I claim as new and desire so secure by Letters Patent of the United States is:

1. In a bottle-sealing machine, the combination of a pressure-applying head, a table for supporting the bottle, a toggle for lifting the table, an elastic abutment between the lower end of the toggle and the frame of the machine, and means for operating the toggle, substantially as described.

2. In a bottle-sealing machine, the combination of a pressure-applying head, a table for supporting the bottle, a toggle for lifting the table, an elastic abutment between the lower end of the toggle and the frame of the machine, means for holding the elastic element of the abutment under initial strain, and means for operating the toggle, substantially as described.

3. In a bottle-sealing machine, the combination of a pressure-applying head, a table for supporting the bottle, a toggle for lifting the table, a pair of compression springs disposed on opposite sides of the line of action of the toggle, and serving as an abutment therefor, and means for operating the toggle, substantially as described.

4. In a bottle-sealing machine, the combination of a pressure-applying head, a table for supporting the bottle, toggle links for lifting the table, one of which is an arm of a bent lever, an elastic abutment for the fulcrum of the bent lever, and a treadle and link connection for operating the bent lever, substantially as described.

5. In a bottle-sealing machine, the combination of a pressure-applying head, a table for supporting the bottle, toggle links for lifting the table, one of which is an arm of a bent lever, an elastic abutment for the fulcrum of the bent lever, means for holding the elastic element of the abutment under initial strain, and a treadle and link connection for operating the bent lever, substantially as described.

6. In a bottle-sealing machine, the combination of a pressure-applying head, a table for supporting the bottle, toggle links for lifting the table one of which is an arm of a bent lever, a pair of compression springs disposed on opposite sides of the line of action of the toggle and serving as an abutment therefor, and a treadle and link connection for operating the bent lever, substantially as described.

Signed by me at New York city, borough of Manhattan, on the 26th day of August, 1904.

SAMUEL W. BALCH.

Witnesses:
FREDERICK RECHT,
OSCAR H. GOODELL