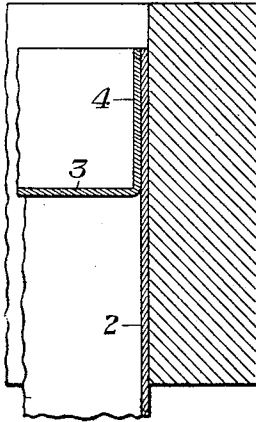


E. F. HULBERT.  
MACHINE FOR SECURING VESSEL CLOSURES.  
APPLICATION FILED NOV. 26, 1917.

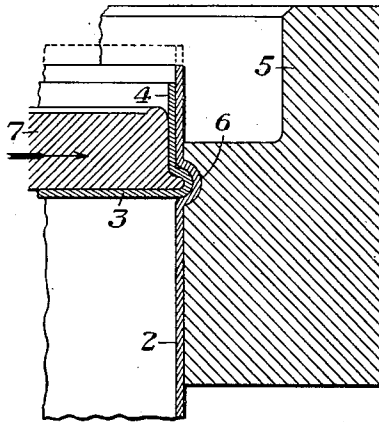
1,319,082.

Patented Oct. 21, 1919.  
2 SHEETS—SHEET 1.

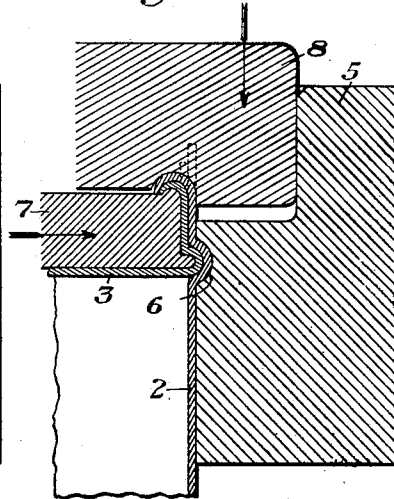
*Fig.1.*



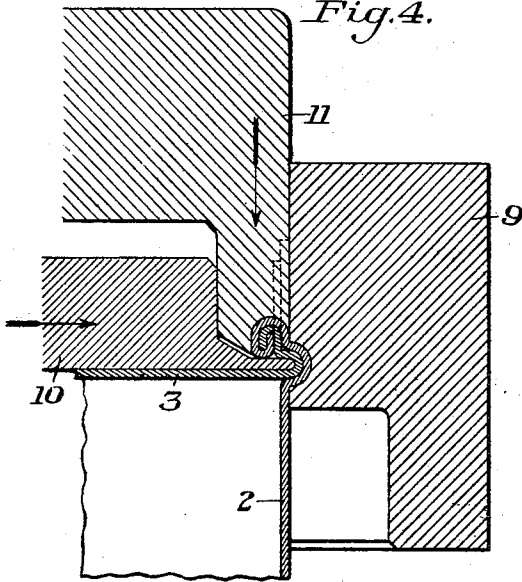
*Fig.2.*



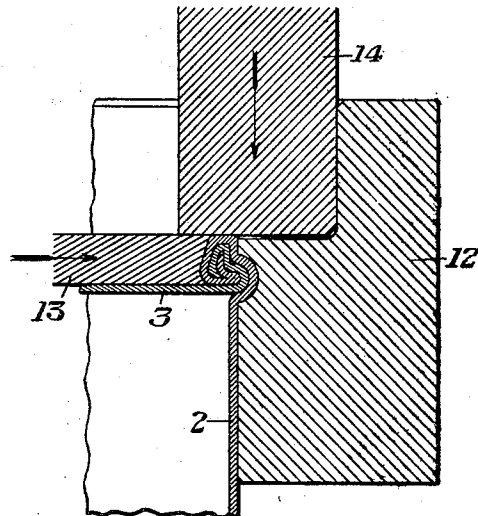
*Fig.3.*



*Fig.4.*



*Fig.5.*



WITNESSES

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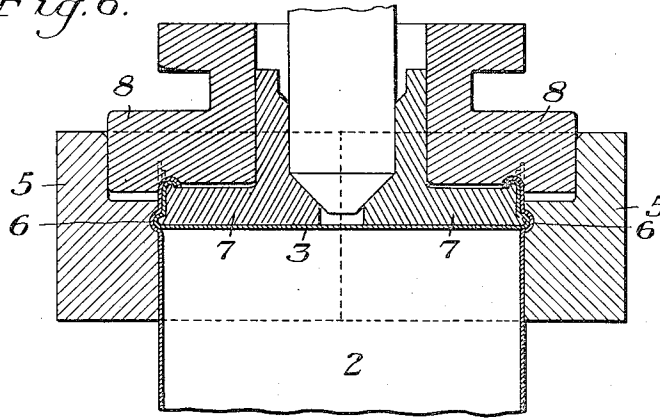
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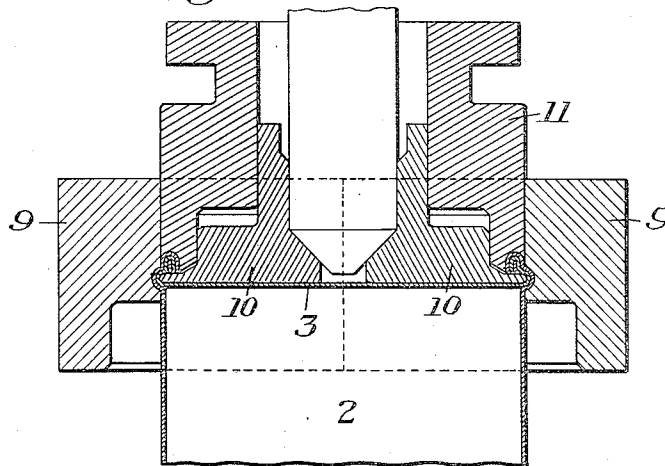
Patented Oct. 21, 1919.

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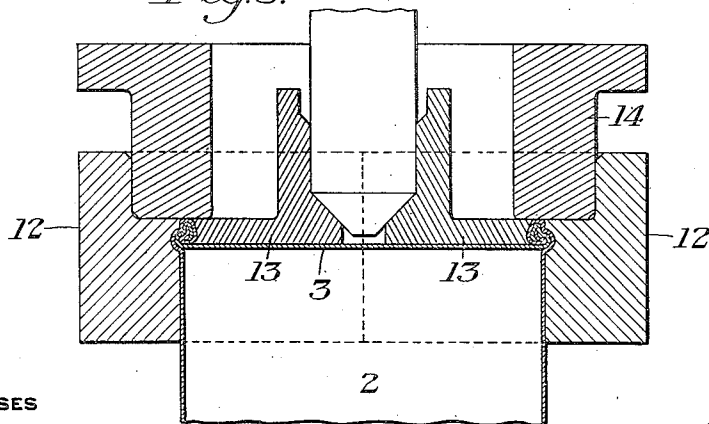
*Fig. 6.*



*Fig. 7.*



*Fig. 8.*



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# UNITED STATES PATENT OFFICE.

EDWIN F. HULBERT, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO NATIONAL PAPER CAN COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF DELAWARE.

## MACHINE FOR SECURING VESSEL-CLOSURES.

1,319,082.

Specification of Letters Patent.

Patented Oct. 21, 1919.

Original application filed April 25, 1914, Serial No. 834,362. Divided and this application filed November 26, 1917. Serial No. 203,923.

*To all whom it may concern:*

Be it known that I, EDWIN F. HULBERT, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Machine for Securing Vessel-Closures, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a partial section showing the flanged closure in place, Figs. 2, 3, 4 and 5 are similar views showing the successive operations performed in securing the closure in place, and Figs. 6, 7 and 8 are vertical sections through the complete dies, the positions of the dies corresponding to the positions shown in the partial sections of Figs. 3, 4 and 5, respectively.

My invention relates to the securing of end closures in cans or similar packages, whether made of paper, metal, or other material.

This application is a division of my co-pending application Serial No. 834,362, filed April 25, 1914.

The object of the invention is to provide a simple and effective machine which will give a strong closure, resistant against jars or shocks in shipping, handling, etc. The invention is particularly applicable to the securing of flanged closures in paper cans, although it may be applied to other receptacles and other materials. The main object of my invention is to lock the closure in place without the necessity of an interior mandrel on which the receptacle body is supported.

In Fig. 1, 2 represents the side wall of the can or receptacle and 3 the closure having a circumferential outwardly projecting flange 4. In the first operation of the device an exterior circular die 5 is used having a circumferential interior recess, as shown at 6, and which die is preferably made in sections. An expansible interior die or mandrel, part of which is shown at 7, is used in connection with the outer die and in the first operation the parts of the inner die 7 are forced out to cause the lips on the inner die to crimp the walls of the closure flange and the can body outwardly into the groove in the outer die or anvil, all as shown in Fig. 2. In the next movement, as shown in Fig. 3, the end die 8

having a depending edge portion and a groove inside thereof is moved downwardly within the outer die 5 and curves the registering edges of the closure flange and receptacle end inwardly and downwardly as shown. The pressure in this step, while sufficient to start the roll-over, is not sufficient to overcome the support given to the cap by the pinching action of the inner and outer dies 5 and 7.

In the next step, shown in Fig. 4, a new outer die or anvil 9, which may be made in sections, and a new expanding inner die or mandrel 10 are used, but the pinching action between these dies remains the same as in the first movement, and the endwise moving die 11 acts downwardly, rolling-over the registering portions of the flange and receptacle and into the seam formed as shown.

In the fourth and final step, shown in Fig. 5, the inner and outer dies 12 and 13 are again changed and the order of movement is reversed. That is, the endwise moving die 14 moves downward until it rests on the recessed portion of the anvil 12 carrying with it the rolled-over seam portion until this rolled-over seam portion is brought in contact with the bottom 3 of the cap. The parts of the expanding inner die 13 are then forced outwardly and radially, as indicated by the arrow. The upper part of the recessed edge portion first comes in contact with the upper part of the seam and the angle of contact forces the roll downwardly and outwardly into the recess or bead portion formed in the first movement. The pressure exerted by this inner die is sufficient to tightly compress the folds together, lock the parts in place by forcing them into the bead or recess in the wall of the receptacle and give a hard wearing edge.

The advantages of my invention result mainly from doing away with the need for interior mandrel support and providing for securing closures to both ends of the receptacle, if desired. This is accomplished by the pinching action of the inner and outer dies, which gives sufficient support for the action of the endwise moving die. The locking of the seam in the bead gives a strong, secure joint, and the package is adapted to withstand blows and shocks.

While the preferred embodiment of the invention has been illustrated and de-

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scribed, it is to be understood that the invention is not limited to its illustrated embodiment, but may be embodied in other structures within the scope of the following claims:

5 1. Apparatus for securing a flanged cap closure to a can without engaging the inside of the can, comprising a die adapted to surround the can body and having an inwardly opening groove, a die adapted to fit within the flanged cap and having a projection to register with the groove and arranged to force a portion of the flange and registering can body into the groove thereby forming an outwardly extending bead on the can body, and means adapted to engage and turn over the edges of the flange and can body and thereby form a closure seam, the outwardly extending bead engaging the groove in the first named die and serving to support the can during the seam-forming operation; substantially as described.

2. Apparatus for securing a flanged cap closure to a can without engaging the inside of the can, comprising a die adapted to surround the can body and having an inwardly opening groove, a die adapted to fit within the flanged cap and having a projection to register with the groove and arranged to force a portion of the flange and registering can body into the groove, and a third die adapted to be moved endwise against the edges of the flange and can body and turn over such edges to form a seam, the can being supported by its engagement with this groove and projection against the endwise pressure of the third die; substantially as described.

3. Apparatus for securing a flanged cap closure to a can without engaging the inside of the can, comprising a means adapted to engage and turn over by endwise pressure the edges of the flange and body to form a closure seam, and means adapted to sup-

port the can against such endwise pressure including a die surrounding the can body and having an inwardly opening groove and a die fitting within the can body and operating to force and hold a portion of the can body and the flange within such groove; substantially as described.

4. Apparatus for securing a flanged cap closure to a can without engaging the inside of the can, comprising a die adapted to surround the can body, a second die adapted to fit within the flanged cap, said dies being adapted to clamp the cap flange and body between them, and a third die adapted to be moved against the edges of the cap and flange body while so held and turn over the said edges to form a closure seam; substantially as described.

5. A device of the character described, comprising means for supporting a can body having a dished lid inserted in the end thereof, including an inner supporting member and an outer supporting member which are adapted to be relatively moved together to press the can body between them, and a die adapted to cooperate with said supporting members to mold together the edges of the can body and lid; substantially as described.

6. A device of the character described, comprising means for supporting a can body having a dished lid inserted in the end thereof, including a mandrel and a die member adapted to surround the mandrel and can body, said mandrel and die member being adapted to be relatively shifted to press the can body between them, and a die adapted to cooperate with said mandrel and die member to roll together the edges of the can body and lid into a locking seam; substantially as described.

In testimony whereof I have hereunto set my hand.

EDWIN F. HULBERT.