Dec. 1, 1942. J. C. GIBBS 2,303,539

MACHINE FOR MANUFACTURING CLOSURE CAPS

Filed Nov. 7, 1939 7 Sheets-Sheet 1

Fig. 1

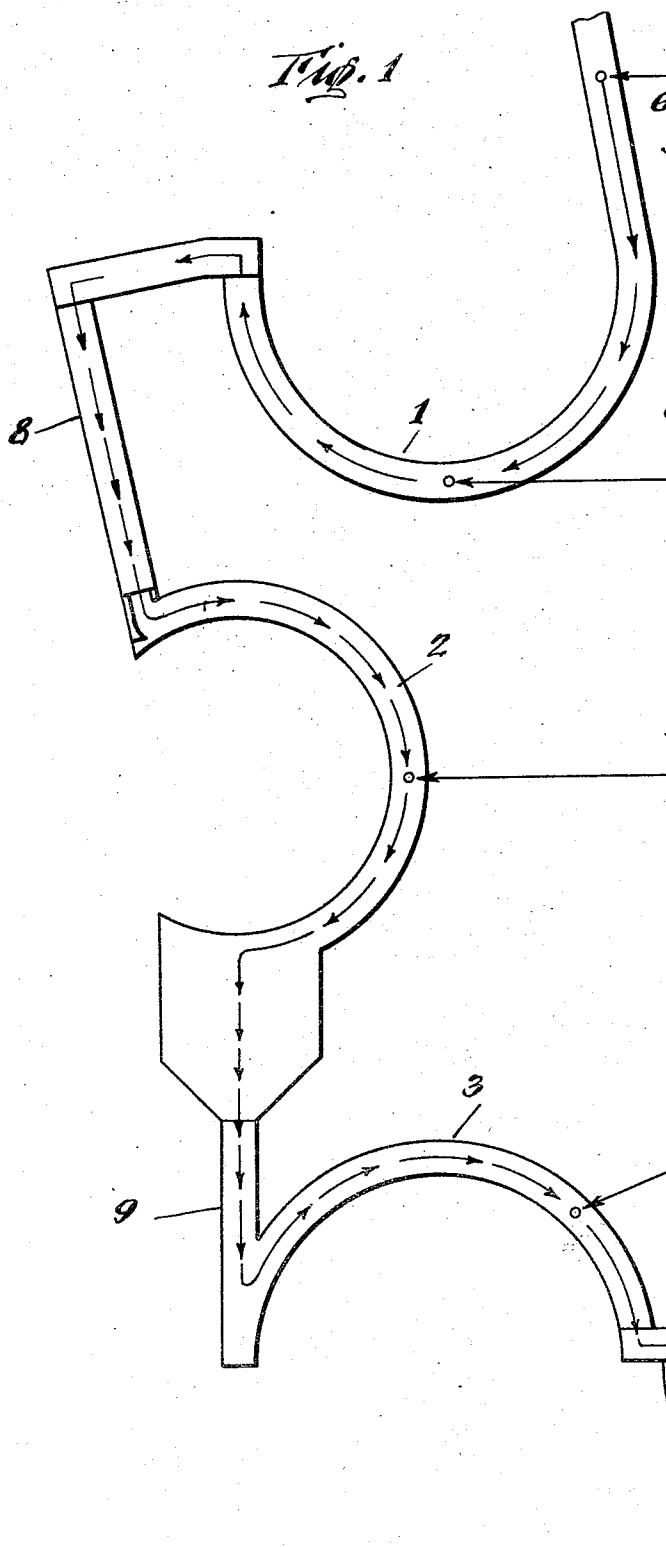


Fig. 2

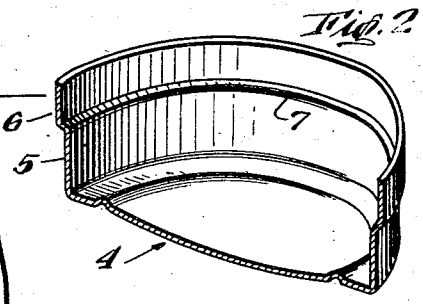


Fig. 3

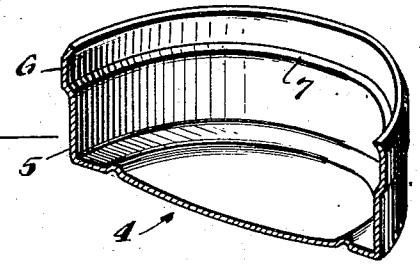


Fig. 4

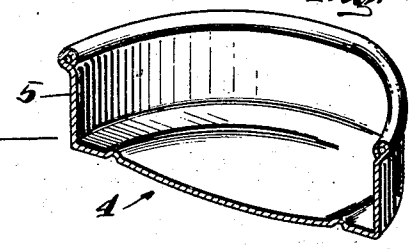
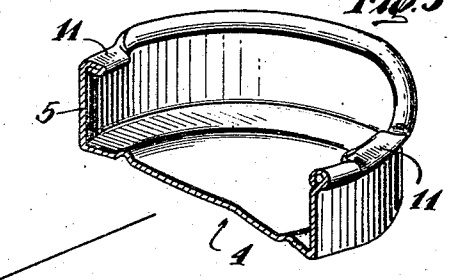


Fig. 5



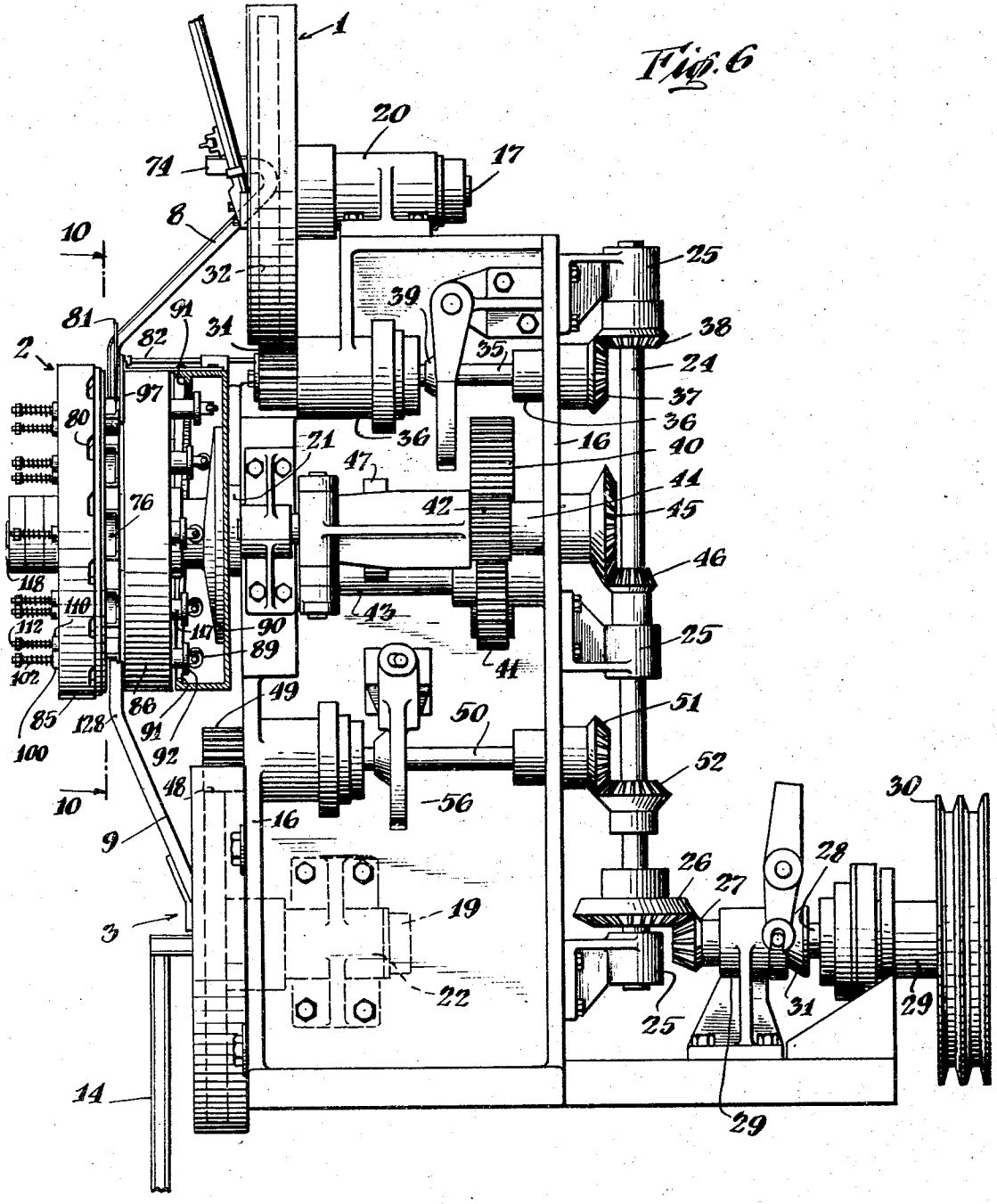
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MACHINE FOR MANUFACTURING CLOSURE CAPS

Filed Nov. 7, 1939 7 Sheets-Sheet 2

Fig. 6



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Dec. 1, 1942. J. C. GIBBS 2,303,539

MACHINE FOR MANUFACTURING CLOSURE CAPS

Filed Nov. 7, 1939 7 Sheets-Sheet 3

Fig. 7

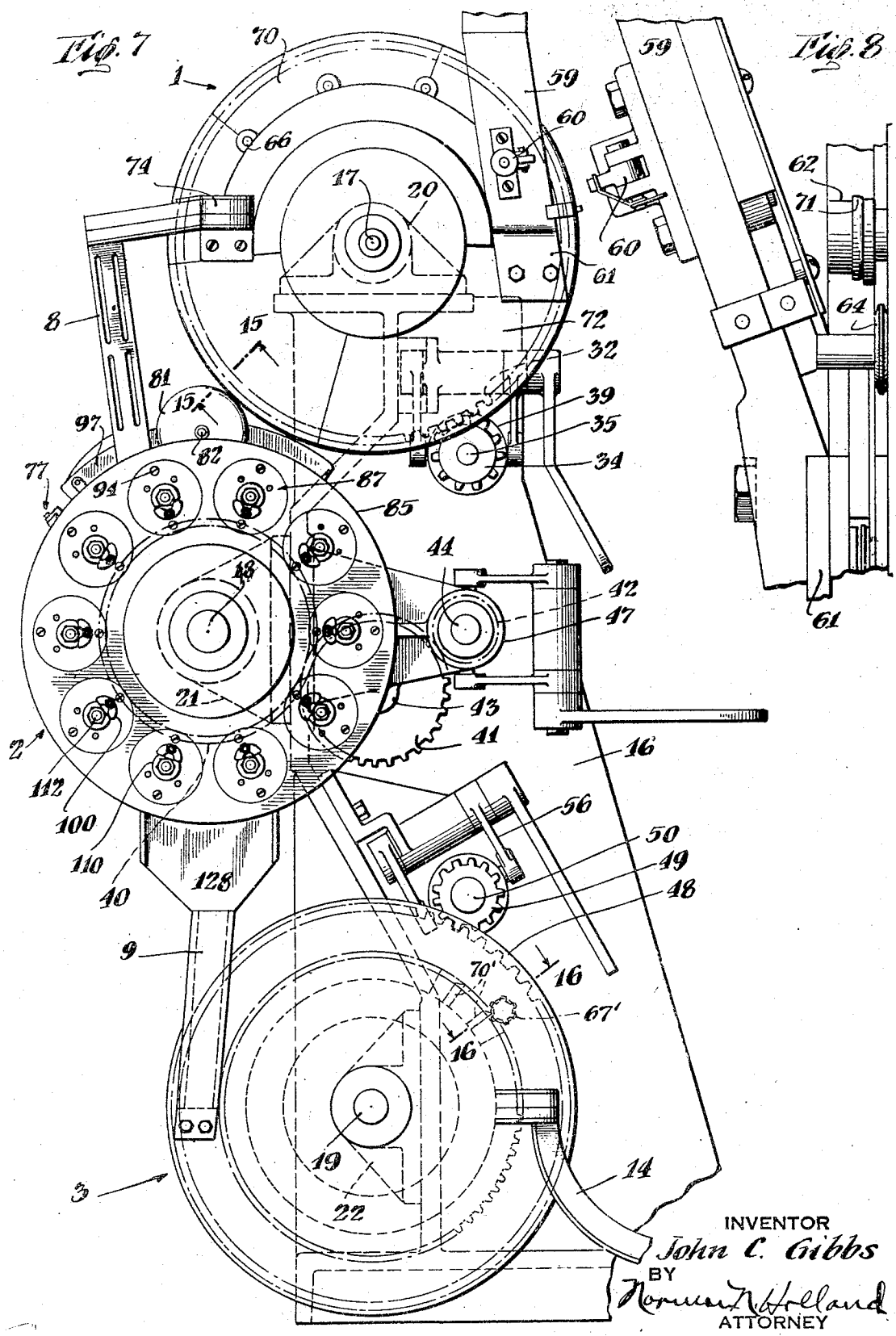


Fig. 8

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MACHINE FOR MANUFACTURING CLOSURE CAPS

Filed Nov. 7, 1939 7 Sheets-Sheet 4

Fig. 9

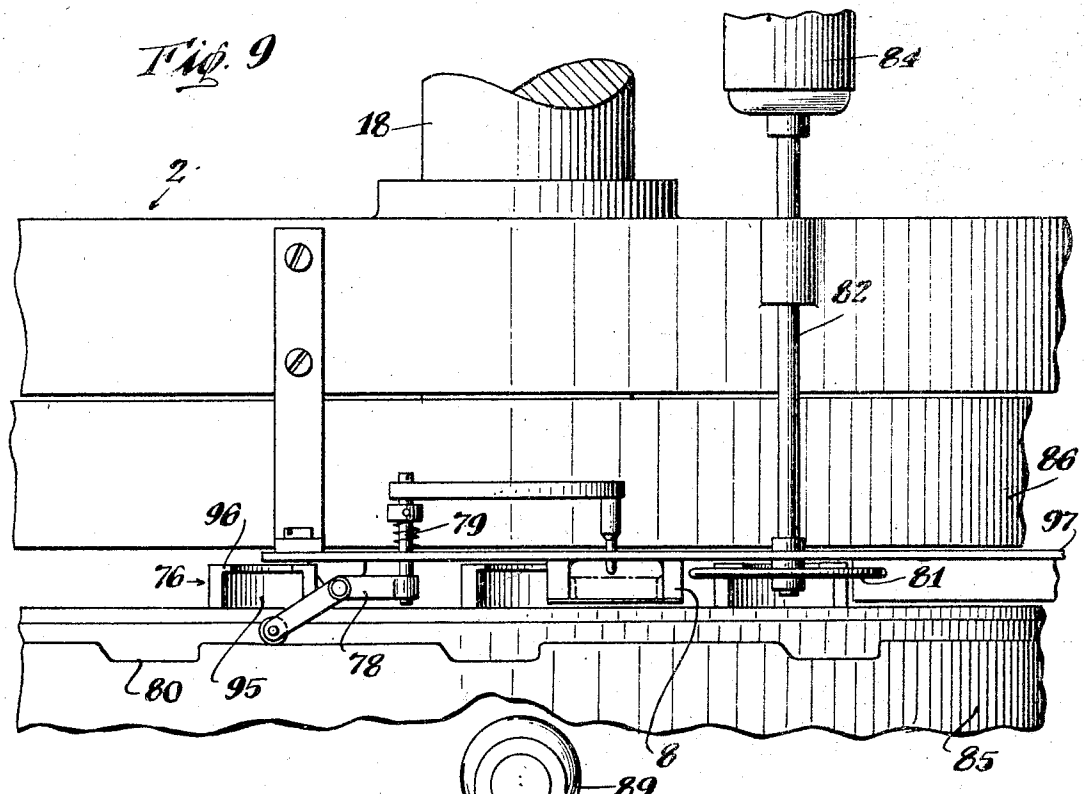
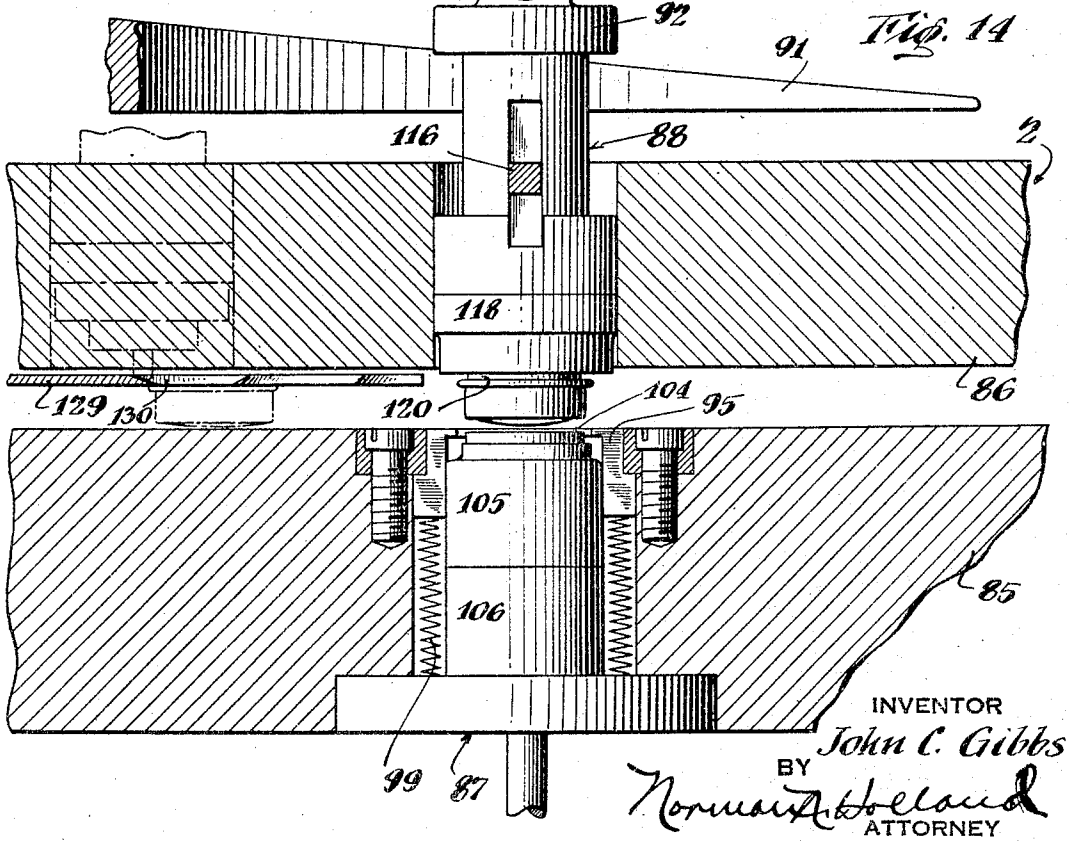


Fig. 14



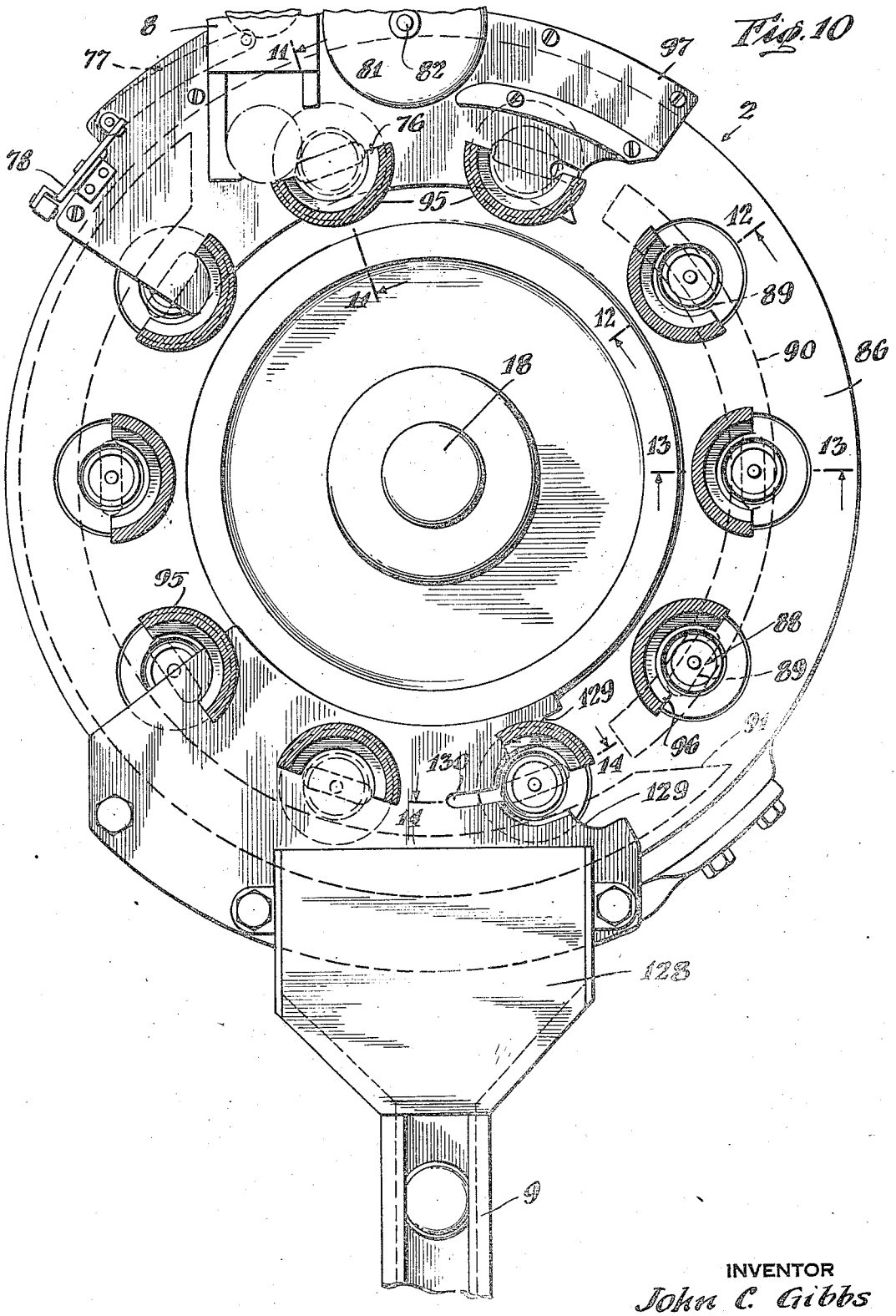
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MACHINE FOR MANUFACTURING CLOSURE CAPS

Filed Nov. 7, 1939 7 Sheets-Sheet 5

Fig. 10



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Dec. 1, 1942. J. C. GIBBS 2,303,539

MACHINE FOR MANUFACTURING CLOSURE CAPS

Filed Nov. 7, 1939 7 Sheets-Sheet 6

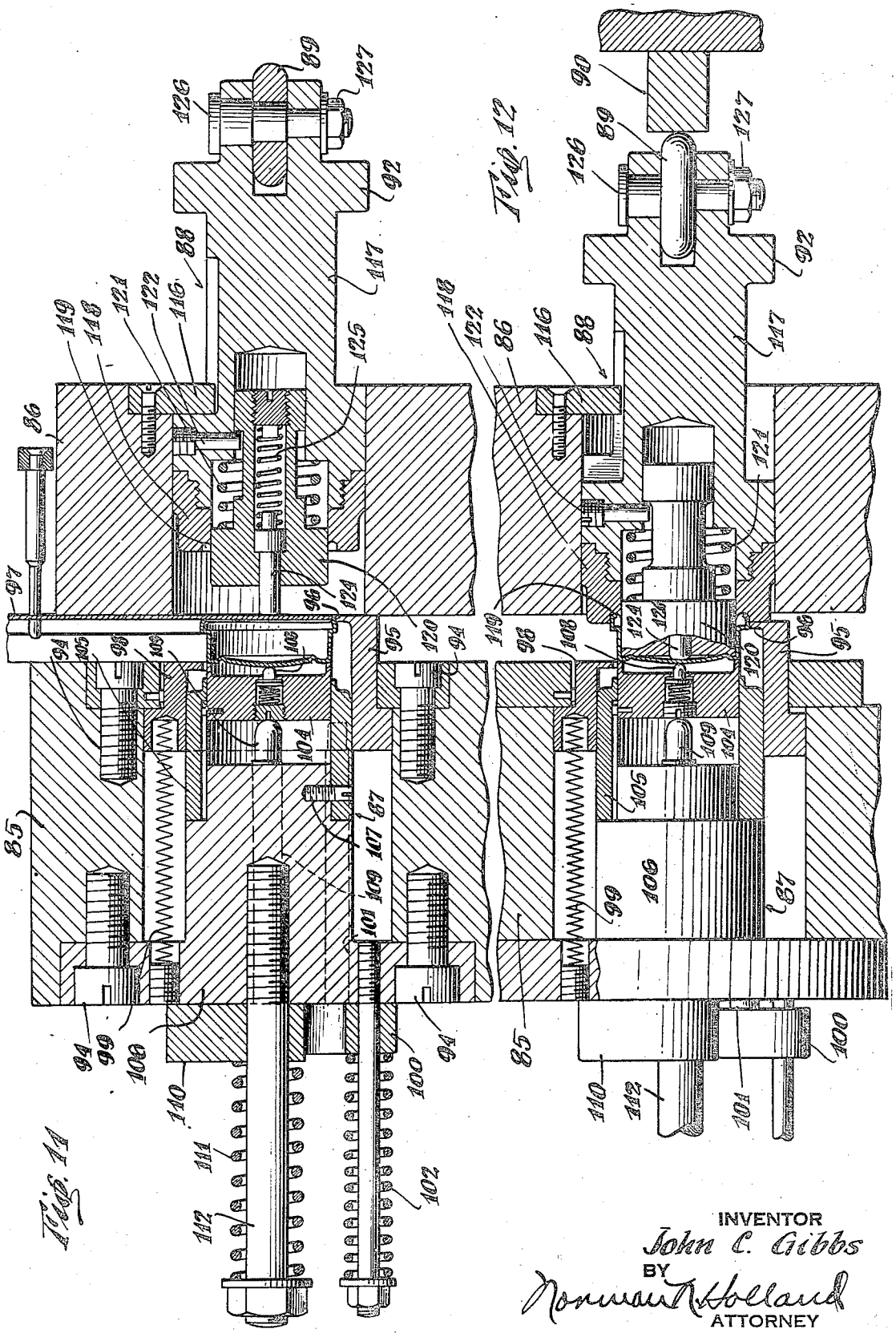


Fig. 11

Fig. 12

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Dec. 1, 1942. J. C. GIBBS 2,303,539

MACHINE FOR MANUFACTURING CLOSURE CAPS

Filed Nov. 7, 1939 7 Sheets-Sheet 7

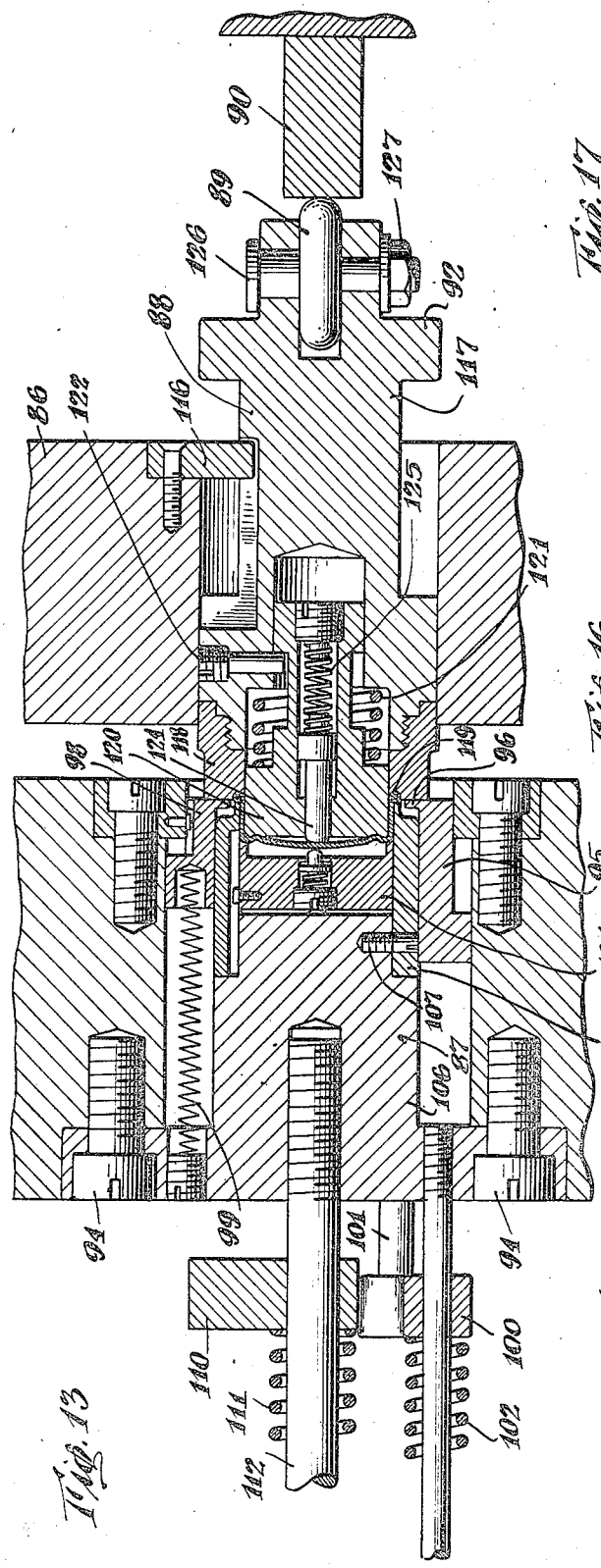


Fig. 13

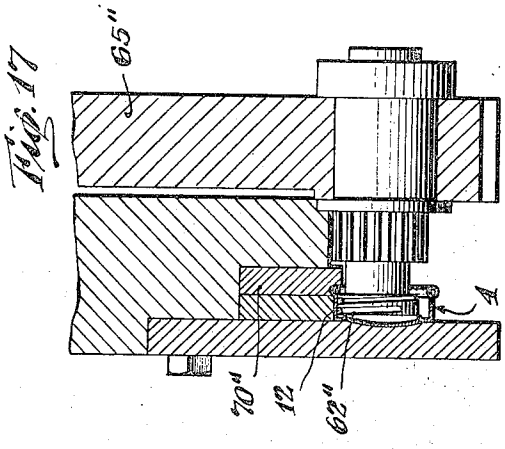


Fig. 17

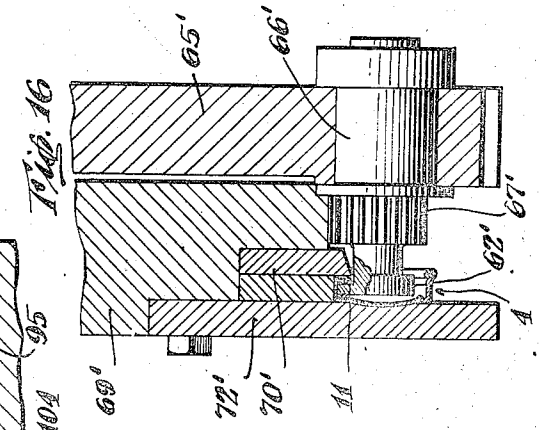


Fig. 16

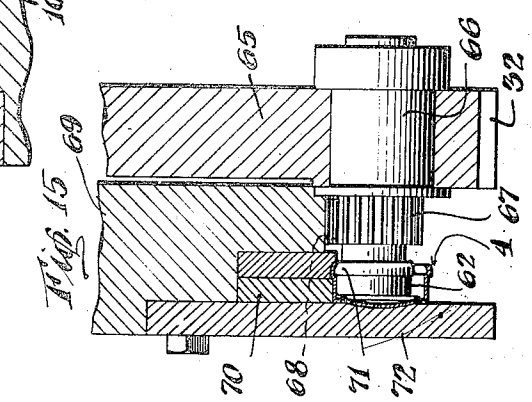


Fig. 15

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Patented Dec. 1, 1942 2,303,539

UNITED STATES PATENT OFFICE

2,303,539

MACHINE FOR MANUFACTURING CLOSURE CAPS

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Application November 7, 1939, Serial No. 303,204

20 Claims. (Cl. 153—2)

The present invention relates to the manufacture of closure caps and more particularly to the manufacture of closure caps with inturned wire edges or beads at the bottoms thereof.

Closure caps are customarily formed with a beaded edge to conceal the raw edge of the metal and thereby to avoid jagged parts likely to injure the hands of a user and also to avoid rust. Due to manufacturing limitations, such beaded edges are generally formed by rolling the edges outwardly, which is a much simpler and heretofore a more speedy operation than rolling them inwardly. An outwardly rolled edge may be formed in a spinning machine as one of the several consecutive operations in the manufacture of closures without slowing up the manufacture. Inturned wire or beaded edges have been formed in so-called dial machines with a start and stop motion as shown for example in my Patent No. 2,282,959, granted May 12, 1942. Because of the slower and more difficult manufacturing operations, outturned wire edges are general in the commercial types of closures and inturned edges are the exception. This is true in spite of the fact that the inturned edge is concededly more attractive because the outer coating and appearance of the cap are uniform and the inner coating of the cap is not visible from the exterior of the cap. It is customary to use more coats of lacquer on the outside of the cap and of a different color than that used on the inside of the cap, hence turning the edge of the cap outwardly contrasts the lacquer of the inside of the cap with that of the outside.

In my application Serial No. 252,741, I provided a machine for spinning the edge inwardly without slowing up manufacturing operations. The present machine is an improvement upon my prior application in that a better and more attractive bead is formed without reducing the speed of the operations. In addition, the shape and size of the bead may be controlled within desired limits and all of the advantages of a dial operation is obtained with the speed of a rotary spinning machine.

An object of the present invention is to provide an improved machine for manufacturing closure caps with inturned beaded edges.

Another object of the invention is to provide a machine which will produce an inturned bead by a chuck or "bumping" operation as one step in the manufacture of the cap, without reducing the speed of manufacture and without increasing the cost of manufacture.

Another object of the invention is to provide means for supporting the cap during the beading operation at the portions likely to collapse, thereby to prevent defective caps and also to prevent the necessity of stopping the machine to remove such defective caps.

Another object of the invention is to provide means for readily controlling the shape and size of the inturned bead.

Another object of the invention is to provide an improved means for feeding the closure blanks to the machine.

A further object of the invention is to provide improved means for removing closures from the machine.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein

Fig. 1 is a diagrammatic view illustrating the passage of the closure blank through the machine, which together with Figs. 2 to 5 shows the several operations performed on the blank in the different parts of the machine;

Fig. 2 is a perspective sectional view illustrating the shape of a blank, after having been stamped in a suitable stamping machine, as it enters the present machine;

Fig. 3 is a perspective sectional view illustrating the first operation on the blank in the first head or stage of the machine where the edge of the blank is turned inwardly to facilitate the formation of the bead of the cap in the second stage;

Fig. 4 is a sectional perspective view illustrating the formation of the inturned bead in the second stage of the machine;

Fig. 5 is a sectional perspective view illustrating the formation of screw lugs in the closure in the third stage of the machine;

Fig. 6 is an end elevational view of the complete machine with portions of the second head shown in section;

Fig. 7 is a front elevational view of the machine with parts broken away;

Fig. 8 is a fragmentary view illustrating a preferred form of feeding mechanism for delivering blanks to the first stage of the machine;

Fig. 9 is a fragmentary top plan view illustrat-

ing a preferred form of feeding mechanism for the second head or stage of the machine;

Fig. 10 is a sectional view along the line 10—10 of Fig. 6 illustrating the interior of the second head or stage of the machine;

Fig. 11 is a sectional view along the line 11—11 of Fig. 10 illustrating the position of the blank and the parts of the second head as the blanks are delivered to the second head of the machine;

Fig. 12 is a sectional view along the line 12—12 of Fig. 10 illustrating the position of the parts in the second head of the machine at the time the chuck is about to engage the free edge of the closure and prior to the movement of the closure in response to pressure applied by the chuck;

Fig. 13 is a sectional view along the line 13—13 of Fig. 10 illustrating the position of the parts in the second head of the machine after the formation of the inturned bead is completed;

Fig. 14 is a sectional view along the line 14—14 of Fig. 10 illustrating the removal of the closures from the second stage of the machine;

Fig. 15 is a sectional view along the line 15—15 of Fig. 7 illustrating the mechanism of the first head of the machine and its operation in turning inwardly the edge of the blank;

Fig. 16 is a sectional view along the line 16—16 of Fig. 7 illustrating the construction and operation of the third head of the machine which forms a lug from the bead of the closure; and

Fig. 17 is a fragmentary sectional view illustrating a modified form of head in the third stage of the machine for forming screw threads in the cap blank to illustrate the application of the invention to various types of closures.

In order to simplify the explanation of the invention, a description of the several stages of the machine, together with the operations performed by the respective stages, will be given first. Referring more particularly to Figs. 1 to 7, the machine is shown with three heads or stages, an upper head 1, a middle head 2, and a lower head 3. The cup-shaped blank 4 shown in Fig. 2 may be stamped with the usual stamping machine and preferably has a skirt 5 with an enlarged cylindrical portion 6 adjacent its free edge and joined to the skirt by a shoulder 7 to permit the edge to be turned inwardly with the inner diameter of the bead substantially equal to the inner diameter of the skirt, as shown more particularly in Fig. 4.

The blank shown in Fig. 2 is fed by a suitable mechanism, such as that shown in Fig. 8, to the upper head 1 of the machine where the extreme edge of the cap is bent slightly inwardly to start the beading operation and to prevent the edge of the cap from turning outwardly under the force of the beading chuck, which might occur if the edge remained flared outwardly slightly in the condition in which it leaves the stamping machine. The blank shown in Fig. 3 leaves the first stage and passes to the second head or stage through guideway 8 and is fed to the second stage through the feeding mechanism shown in Fig. 9. In the second head or stage a chuck engages the edge of the blank, which has already been turned in slightly in the first stage, and rolls it into the form shown in Fig. 4. The chuck, prior to the beading operation, forces the blank into a holder where it is rigidly supported against collapsing. The beaded blank is removed from the second head by the delivery mechanism shown in Fig. 14 and is fed through a guideway and a suitable feeding mechanism, which may, for example, be that shown in Fig. 8, into the third head or stage of the machine where the beaded edge is struck inwardly to form screw lugs 11 as shown in Fig. 5. If desired, the construction of the third head or stage of the machine may be adapted to form the usual screw threads 12 (Fig. 17) or any other type of holding means. The finished caps are delivered from the third stage to a guideway 14 and thence into a suitable packing carton or to a suitable lining, polishing and counting device.

The several mechanisms described generally above will now be described in detail. For convenience the mechanisms 1, 2 and 3 are referred to herein as heads or stages. First the frame work of the machine and the drive for the parts will be described. Referring more particularly to Figs. 6 and 7, there is shown a box-like frame having sides 16 for supporting and carrying various parts of the machine. The heads 1, 2 and 3 are mounted on shafts 17, 18 and 19 respectively, which in turn are mounted in bearings 20, 21 and 22 respectively. The right side of the machine (Fig. 6) has a vertical shaft 24 mounted in bearings 25 and geared through a bevel gear 26 at its lower end to the bevel gear 27 on the end of the main drive shaft 28 mounted in bearings 29 and driven by a suitable motor or pulley 30. A clutch 31 is adapted to start and stop the machine without shutting off the power. In this way the vertical drive shaft 24 is driven through the clutch 31. The upper head 1 of the machine is operatively connected to the vertical drive shaft 24 through gear 32 on the periphery of the head 1 (Fig. 7), gear 34 on shaft 35 mounted in bearings 36 on the sides of the machine, bevel gear 38 on the vertical shaft 24. A suitable clutch 39 permits the power to be shut off from the upper head without stopping the rest of the machine.

The middle head is operatively connected to and driven by the vertical shaft 24 by means of gear 40 on the shaft 18 for the middle head, gear 41 on shaft 43 and gear 42 on shaft 44 which has a bevel gear 45 meshing with bevel gear 46 on the vertical drive shaft 24. A suitable clutch 47 permits the head to be started and stopped without stopping the entire machine. The lower head is operatively connected to the vertical shaft 24 through a peripheral gear 48 on the lower head, and gear 49 on the shaft 50 which is mounted between the sides 16 of the frame which has a bevel gear 51 on its opposite end meshing with the bevel gear 52 of vertical shaft 24. A suitable clutch 56 allows starting and stopping of the lower head without cutting off the power to the entire machine.

Referring more particularly to Fig. 8, a suitable feeding mechanism is outlined for delivering the blanks one at a time to the first stage of the machine. Blanks 4 (Fig. 3) preferably are delivered from a stamping machine through the guideway 59 and past a stop mechanism 60, which may be operated to stop the passage of the caps through the passageway when desired. The guideway joins the first head of the machine at 61 where the lowermost cap in the guideway is in the path of the moving members 62. As a member 62 engages the skirt of the lowermost cap it simultaneously engages a roller 64, thus moving the roller outwardly, which in turn releases the lowermost cap so that it is carried away by the member 62 and thus passes into the first head of the machine.

The first stage of the machine preferably has an operating head of the general type shown in the Charles Hammer Patent No. 1,671,990, dated June 5, 1928, suitably changed to spin inwardly the lower edge of the blank. Referring to Figs. 7 and 15 herein, a series of members 62 are rotatably mounted on a continuously rotating disc 65 by means of the stub shafts and bearings 66 to travel around the periphery of the stationary disc 69. A gear 67 meshes with gear teeth 68 on the periphery of the stationary disc 69 to cause the members 62 to rotate during their orbital movement. Suitable plates or sections 70 are bolted to the stationary disc 69, the edges of the plates 70 being suitably shaped to cooperate with a surface 71 on the member 62 to bend the edge of the blank inwardly. An outer plate 72 serves to hold the blank in position on the member 62. As the rotary disc 65 is rotated, thus carrying the series of members 62 about the stationary disc 69, successive blanks are drawn from the feeding mechanism and their edges turned inwardly as shown in Fig. 3. When the blanks reach the discharge station 74, they are removed from the member 62 and pass through the chute 8 to the feeding mechanism for the second head of the machine.

The problem of feeding the blanks to the second head of the machine is somewhat different from that to the first and third heads in that they are fed to pockets 76 (Fig. 10) and not to members which can engage the inside of the skirt. Referring more particularly to Figs. 9 and 10 there is shown a release mechanism 77 operated through the links 78 and 79 and the cam surfaces 80 of the third head to release a single cap from the guideway periodically, and properly time it to fall in a pocket 76. To facilitate the feeding operation, a blast of air may be used to supplement the action of gravity. In addition, a disc 81, preferably of leather or other flexible material, is mounted on a shaft 82 rotated by a motor 84 to wipe or force the caps firmly into the pockets as the pockets pass the feeding station.

Referring more particularly to Figs. 6, 11, 12 and 13, the middle head 2 of the machine comprises an outer cylindrical member 85 and an inner cylindrical member 86. The guideway 8 for delivering the blanks leads between these two members. The outer member 85 (Fig. 11) has a series of holders 87 for the closures, with parts projecting outwardly between the two cylindrical members 85 and 86 to provide pockets for the reception of the blanks. The inner member 86 is provided with a corresponding series of axially disposed chucks 88. As shown in the drawings, the chucks have a series of rollers 89 engaging a suitable cam 90 (Figs. 6, 12 and 13) to force the chucks inwardly toward the rollers. The chucks are withdrawn from their inward position by a second cam 91 (Fig. 6) engaging beneath the projections 92 on the chucks. The cylindrical members 85 and 86 rotate continuously and are fixed to each other so that the holders and chucks rotate together in axial alignment at all times.

The details of the chucks and holders in their several positions for the beading of the blanks are shown in Figs. 11, 12 and 13. Referring more particularly to Fig. 11 where the parts are shown as the blank enters the machine, the holder 87 is shown secured to the outer cylindrical member 85 by bolts 94. The blanks are held in position at this station by a semi-cylindrical member 95 having an inwardly extending flange 96 engaging a cap blank at the edge thereof. A suitable metal plate 97 separates the chuck and holder at this stage and holds the blank on the semi-cylindrical member 95. An upper cylindrical member 98 corresponds, except for length, substantially to the lower member 95 and forms an enclosure about the blank. The upper semi-cylindrical member 98 is held in its outward position by a spring 99 and the lower semi-cylindrical member 95 is held in position by the plate 100 connected thereto by pins 101 (Figs. 12 and 13). The plates 100 are held in position by the springs 102 which tends to hold plates 100 and semi-cylindrical members 95 in the position shown in Fig. 11. The spring 102 serves the same function for the lower semi-cylindrical member 95 as the spring 99 does for the upper semi-cylindrical member 98. A resiliently mounted plate or backing member 104 for the blank is mounted within the semi-cylindrical members 95 and 98 and is keyed to a cylindrical member 105, which is in turn fixed to a part 106 by a bolt 107, so that the plate 104 may move to the left when pressure is applied to the edge of the blank. The plate 104 has a resiliently mounted finger 108 associated therewith adapted to force the blank toward the separating plate 97 (Fig. 11). The plate 104 is resiliently held in position, as shown in Fig. 11, by a pin 109 which passes through the member 106 and connects with the member 110, which is in turn held in position on the outer cylindrical member 85 by a spring 111 on the bolt 112.

The axially aligned chuck 88 (Figs. 11, 12 and 13) is held in position by a member 116 bolted to the cylindrical member 86 and comprises a main member 117 having a suitable die 118 grooved at 119 for bending inwardly the edge of a closure cap. A suitable presser plate 120 is resiliently mounted in the main member 117 by a spring 121 and a key pin 122, and the presser plate 120 passes through the die member 118 carried by the chuck. Centrally disposed within the presser member is an ejector pin 124 resiliently mounted therein by means of a spring 125.

As the second head continues to rotate past the feeding station it moves to the position shown in Fig. 12 (see also Fig. 10), which is past the separating plate 97 shown in Fig. 11. At this point the cam 90 has moved the chuck 88, as shown in Fig. 12, inwardly until the groove 119 in the die 118 is enclosed about the edge of the blank. The ejector finger 124 has been moved backwardly against the spring 125 (Figs. 11 and 12) until the end of the ejector finger is flush with the presser plate 120 of the chuck 88. The presser plate 120 is, of course, firmly pressed against the inside of the cover of the blank.

As the second head rotates further, the cam 90 (Figs. 6, 12 and 13) continues to move the chuck 88 inwardly until the position shown in Fig. 13 is finally reached (see also Fig. 10). In this position, the bead has been formed by the movement of the chuck 88 toward the holder 87. In the movement of the chuck 88, the ejector finger 124 first engages the cover of the blank and thereafter the presser plate 120 engages the cover of the blank. With the curling die 118 encompassed about the edge of the cap, further movement of the chuck causes the die 118 to press against the lower semi-cylindrical member 95, which forms the pocket for the closure at the

feeding station, and forces said lower semi-cylindrical member in opposition to the spring 102 (Fig. 11) until it is in alignment with the upper semi-cylindrical member 98 to completely encircle the flange of the blank. During this movement of the chuck and the lower semi-cylindrical member 95, the resiliently mounted member 104 of the holder is forced against the pin 109 and moved in opposition to the spring 111 until the blank is nested within the cylindrical member 105 to which the resilient member 104 is keyed, as shown more particularly in Fig. 13. As the groove 119 of the chuck die 118 becomes effective on the edge of the cap both the upper semi-cylindrical member 98 and the lower semi-cylindrical member 95 are moved against their respective springs 99 and 102 until they are disposed slightly below the enlarged portion of the blank. In the meantime the closure blank has been forced into the cylindrical member 105 until the end of the member 105 rests against the shoulder 7 of the closure blank. Thus at the time the edge of the cap is bent inwardly by the chuck, the inside of the cap is supported by the presser plate 120, the outside of the skirt of the cap and the shoulder 7 of the cap are enclosed and supported by the cylindrical member 105, and the outside of the enlarged portion of the closure is enclosed and supported by the upper and lower semi-cylindrical members 98 and 95. Thus the cap is supported at all points, which eliminates any possibility of the skirt of the cap collapsing during the "bumping" or beading operation.

The shape and size of the bead may be controlled in part by the shape and size of the groove 119 in the die member 118 of the chuck 88. To further control the shape and size of the bead and to facilitate ready adjustment thereof, the cam roller 89 engaging the cam 90 is mounted on an eccentric bolt 126. By turning the eccentric bolt 126, the roller 89 is moved closer to or further from the cam 90 so that the amount of inward movement of the chuck may be controlled. In this way, a tight bead may be formed and the distance that the bead is bent or formed may be determined. A nut 127 serves to hold the adjusted bolt 126 in desired position.

Continued rotation of the second head causes the chuck 88 to pass the cam 90 and the enlargement 92 thereof to be engaged by the cam 91 (Fig. 6) to move the chuck back to its original position as shown in Fig. 11, prior to reaching the delivery station 128 (Fig. 10). The ejector pin 124 of the chuck 88 holds the beaded blank in position to be engaged by the stripping plate 129 (Figs. 10 and 14). The lower semi-cylindrical member 95 of the holder, which forms the pocket for receiving the cap at the feeding station, is now in inverted position and offers no obstruction to the cap leaving the machine. The upper semi-cylindrical part 98 of the holder is of course retained in the position shown in Fig. 11 and offers no obstruction to the delivery of the cap. In addition, the stripping plate 129 (Figs. 10 and 14) engages under the beaded edge of the cap and strips it off of the ejector pin 124 and simultaneously the chuck 88 is moved by the cam 91 (Fig. 6) so that the blank has to fall into the delivery chute 128. The notch 130 (Figs. 10 and 14) is provided to give ample space and time for the ejector pin 124 to be withdrawn as a result of the movement of the chuck by the cam 91.

The beaded caps pass from the delivery chute 128 through the guideway 9 into the third head of the machine. The latter is preferably similar to the first head and has (Fig. 16) a rotary disc 65' with suitable members 62' rotatably mounted thereon by means of bearings 66'. A stationary disc 69' has a gear at its periphery engaging the gear 67' for rotating the member 62'. A plate 70' is adapted to cooperate with the member 62' to strike in the beaded edge at intervals about the circumference of the cap to form the lugs 11 (Figs. 5 and 18). The plate 72' is adapted to hold the cap in position on the member 62'. The finished caps leave the third head and pass through a guideway 14 to a machine for placing liners in the caps.

While the preferred embodiment illustrates the formation of lugs from the bead of the cap, it is to be understood that any other suitable holding means may be formed in the cap. For example, in Fig. 17, a mechanism similar to that illustrated in Figs. 15 and 16 is shown except that the members 70'' and 62'' are formed with screw threads instead of with lugs as in Fig. 16. Otherwise, the mechanism in Fig. 17 is the same as that shown in Figs. 15 and 16.

In view of the description given at the beginning of the specification of Figs. 1 to 7 showing the various steps in the operation of the machine, and in view of the description of the operation of the second stage of the machine at the determination of the description thereof, it is not believed necessary or desirable to repeat the description of the operation of the machine at this point, as the operation will be clear from the foregoing.

It will be seen that the present invention provides a machine which may be operated at very high speeds, without any stop and start mechanism, to form inturned beads on the edges of closure caps. The bead may be rounded to any desired extent because a "bumping" operation is used as distinguished from a spinning operation. As pointed out above, the spinning operation is difficult to combine with the other operations in the manufacture of the closure, and is even more difficult to combine with them so as to effectively regulate the shape and contour of the bead formed. With the present machine, a rounded bead may be formed without difficulty and the caps may be manufactured at the same speed as the machines commonly used for making closure caps with an outturned wire or bead. Thus, inturned edge caps of the highest quality and standard can be made by the present machine at the same manufacturing cost as the outturned beads, and a better cap is provided at the same cost. The machine is rugged in construction and fully capable of withstanding any rough usage to which it may be subjected.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. In a machine for manufacturing closure caps, a head for receiving cup-shaped blanks formed of sheet metal and for turning in the lower edge thereof, a second head having reciprocating means therein for receiving the blanks from said first head and for forcing said inturned edge into an inturned bead, and means for continuously rotating said second head.

2. In a machine for manufacturing closure caps, a head for receiving cup-shaped blanks formed of sheet metal and for turning in the lower edge thereof, a second head having reciprocating means therein for receiving the blanks from said first head and for forcing said inturned edge into an inturned bead, means for continuously rotating said second head, and a third head for receiving said blank from the second head and forming screw means in the skirt thereof.

3. In a machine for manufacturing closure caps, a head for receiving cup-shaped blanks formed of sheet metal and for turning in the lower edge thereof, a second head having reciprocating means therein for receiving the blanks from said first head for forcing said inturned edge into an inturned bead, means for continuously rotating said second head, and a third head for receiving the cap from said second head and for striking in the bead of the cap to form screw lugs therein.

4. In a machine for making closure caps, the combination of a head for receiving sheet metal blanks having a substantially cylindrical flange or skirt enlarged at its lower edge and for turning in the lower edge thereof, a second head having reciprocating means for receiving the blanks from said first head and turning said inturned edge further inwardly into a bead and means for continuously rotating said second head.

5. In a machine for making closure caps, the combination of a head for receiving sheet metal blanks having a substantially cylindrical flange or skirt enlarged at its lower edge and for turning in the lower edge thereof, a second head having reciprocating means for receiving the blanks from said first head and turning said inturned edge further inwardly into a bead, means for continuously rotating said second head, and a third head for receiving the blanks from said second head and striking inwardly said bead to form lugs.

6. In a machine for manufacturing closure caps, a plurality of shafts, a drive shaft substantially at right angles to said plurality of shafts, gears operatively connecting said drive shaft to said other shafts and a head on one of said plurality of shafts for forming an inturned bead on the flange of a cup-shaped sheet metal blank and a head on another of said shafts adapted to form screw lugs from said inturned bead.

7. In a machine of the class described, the combination of a rotary head having resiliently mounted members thereon forming pockets for receiving flanged blanks, means for feeding said flanged blanks to said pockets and a rotary member for engaging and forcing said flange members into said pockets.

8. In a machine of the class described, the combination of a rotary head having pockets therein formed by resiliently mounted members for receiving blanks for the manufacture of closure caps, means for feeding said blanks one at a time to said pockets, a rotary disc for engaging said blanks and forcing them into said pockets and means for rotating said rotary disc.

9. In a machine of the class described, the combination of a rotary head, a reciprocable substantially semi-cylindrical member mounted in said rotary head for receiving blanks for the manufacture of closure caps, means for feeding blanks one at a time to said semi-cylindrical member as it passes the feeding means, and a rotary disc for forcing the blanks into place in said semi-cylindrical member.

10. In a machine of the class described, the combination of a rotary head, a reciprocable substantially semi-cylindrical member mounted in said rotary head for receiving blanks for the manufacture of closure caps, a second reciprocable substantially cylindrical member juxtaposed to said first semi-cylindrical member and offset with respect thereto at one end to form a pocket, and means for feeding blanks one at a time to said pocket as it passes the feeding means.

11. In a machine of the class described, the combination of a rotary head, a reciprocable member mounted in said rotary head, adapted to extend partially about a cap blank to form a pocket for receiving a cap blank, means for feeding blanks to said pocket as it passes the feeding means, a second reciprocable means cooperating with said first reciprocable means to form a pocket extending substantially entirely about the cap blank, and means for moving said reciprocable means with respect to each other to enclose the blank.

12. In a machine of the class described, the combination of a rotary head, means for continuously rotating said head, reciprocable members mounted in said rotary head adapted to extend partially about a cap blank to form pockets for receiving cap blanks, means for feeding blanks to said pockets as they pass the feeding means, other reciprocable means cooperating with said first reciprocable means to form a pocket extending substantially completely about the cap blank, and means for moving said reciprocable means with respect to each other to enclose the respective blanks.

13. In a machine of the class described, the combination of a rotary head, a reciprocable member mounted in said rotary head to form a pocket for receiving a cap blank, means for feeding blanks to said pocket as it passes the feeding means, a second reciprocable means cooperating with said first reciprocable means, means for moving said reciprocable means with respect to each other to enclose the blank, means adapted to support the cap blank at the interior thereof, and bending means cooperating with said reciprocating means for forming inturned beads on the bottoms of the respective blanks during rotation of said rotary head.

14. In a machine of the class described, the combination of a rotary head, means for continuously rotating said head, reciprocable members mounted in said rotary head to form pockets for receiving cap blanks, means for feeding blanks to said pockets as they pass the feeding means, other reciprocable means cooperating with said first reciprocable means, means for moving said reciprocable means with respect to each other to enclose the respective blanks, and bending means cooperating with said reciprocating means for forming inturned beads on the bottoms of the respective blanks during rotation of said rotary head.

15. In a rotary head for manufacturing closure caps, the combination of a support for a cup-shaped closure blank, said blank having an enlarged substantially cylindrical portion at its free edge, a second support having a cylindrical portion adapted to engage the enlarged portion of said blank, a chuck adapted to engage the free edge of said cap and move it and said first support until the cylindrical portion of the second support engages the enlarged portion of the

blank and thereafter to curl the edge of the blank into an inturned bead.

16. In a rotary head for manufacturing closure caps, the combination of a pocket for a cup-shaped blank having an enlarged portion adjacent its free edge, a chuck for engaging and turning inwardly the free edge of the blank, circular means adapted to fit about and support said blank at said enlarged portion, and means for moving said chuck into engagement with the free edge of the blank and continuing the movement of the chuck to force the blank into engagement with said circular means and to turn in the free edge of the blank while the enlarged portion thereof is in engagement with said circular means.

17. In a rotary head for manufacturing closure caps, the combination of a pocket for a cup-shaped blank, a chuck for engaging and turning inwardly the free edge of the blank, circular means adapted to fit about and support said blank adjacent the free edge thereof, means for moving said chuck into engagement with the free edge of the blank and continuing the movement of the chuck to force the blank into said circular means and to turn in the free edge of the blank, and means for predetermining the distance the chuck moves to regulate the turning in of the free edge of the blank.

18. In a machine of the class described, the combination of a rotary head having a pocket therein adapted to receive a sheet metal blank to be formed into a closure, said blank having an enlarged lower portion, a chuck oppositely disposed with respect to said pocket, means associated with said pocket for engaging and supporting the enlarged lower portion of said closure and means for forcing said chuck against the free edge of said blank and turning it inwardly to form an inturned bead.

19. In a machine of the class described, the combination of a rotary head having a pocket therein for receiving a sheet metal blank to be formed into a closure cap, said pocket being formed from a pair of semi-cylindrical members, one of said semi-cylindrical members being set back with respect to the other to form a pocket with a normally open side adapted to facilitate entry of the blank into the pocket, a chuck axially disposed with respect to said semi-cylindrical members and means for forcing said chuck toward the closure cap.

20. In a machine of the class described, the combination of a rotary head having pockets therein for receiving sheet metal blanks to be formed into closure caps, said pockets being formed from pairs of semi-cylindrical members, one member of each pair of said semi-cylindrical members being set back with respect to the other to form a pocket for the blank, chucks axially disposed with respect to said pairs of semi-cylindrical members and means for forcing said chucks toward the closure cap consecutively and for moving one member of each pair of said cylindrical members with respect to each other consecutively to completely enclose the closure caps and for forming inturned beads thereon while so enclosed.

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