May 27, 1924.

1,495,650

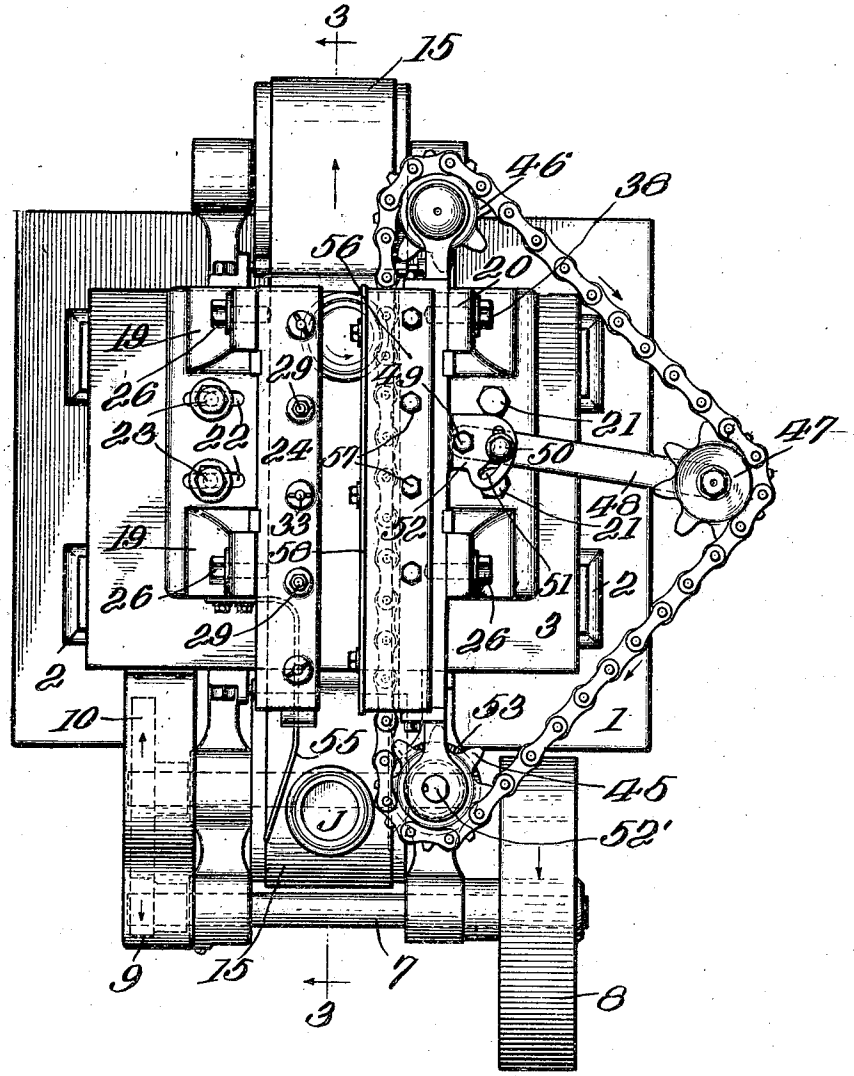
T. L. TALIAFERRO

JAR CLOSING MACHINE

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5 Sheets-Sheet 1

Fig. 1.



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FIG. 2.

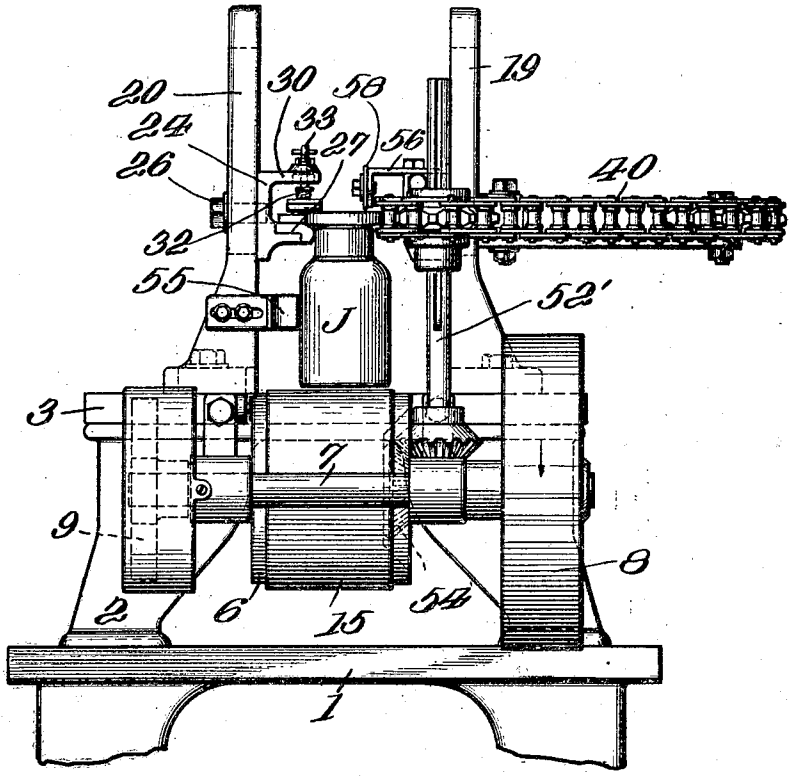
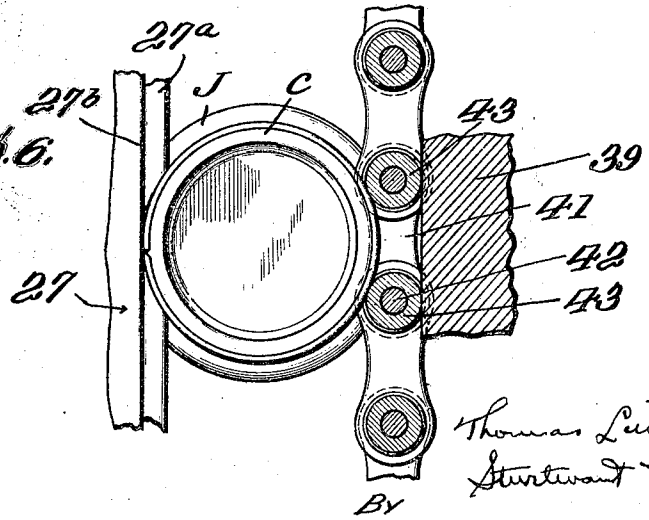


FIG. 6.



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FIG. 3.

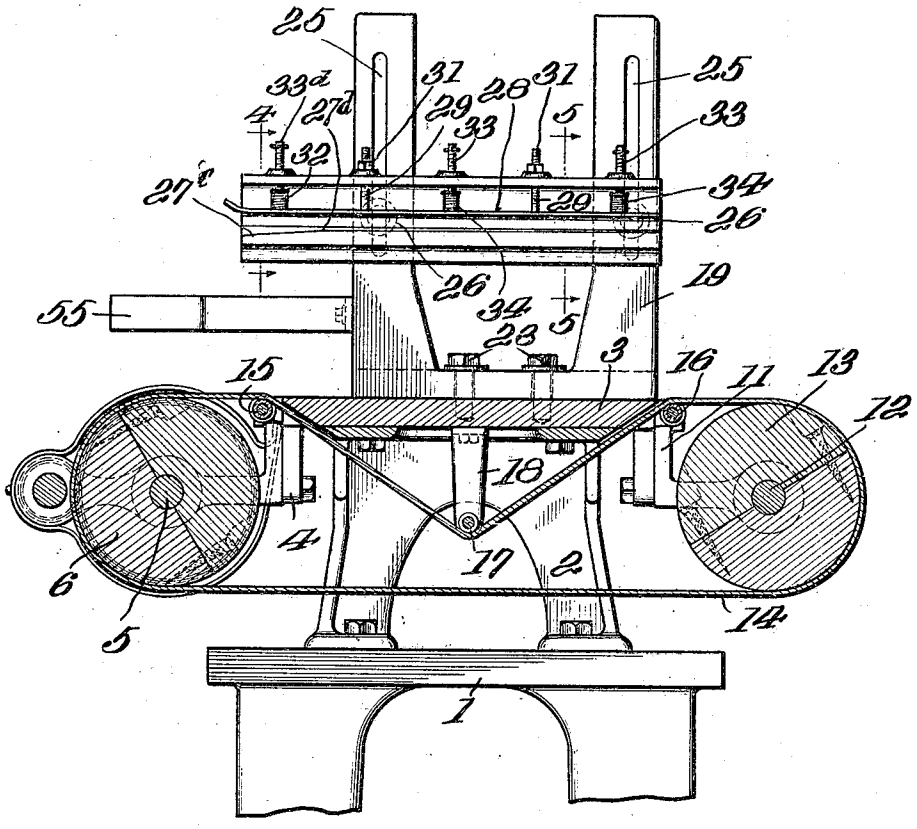


FIG. 7.

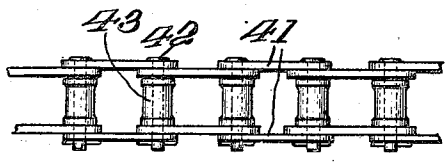
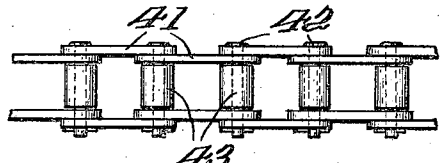


FIG. 8.



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JAR CLOSING MACHINE

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FIG. 4.

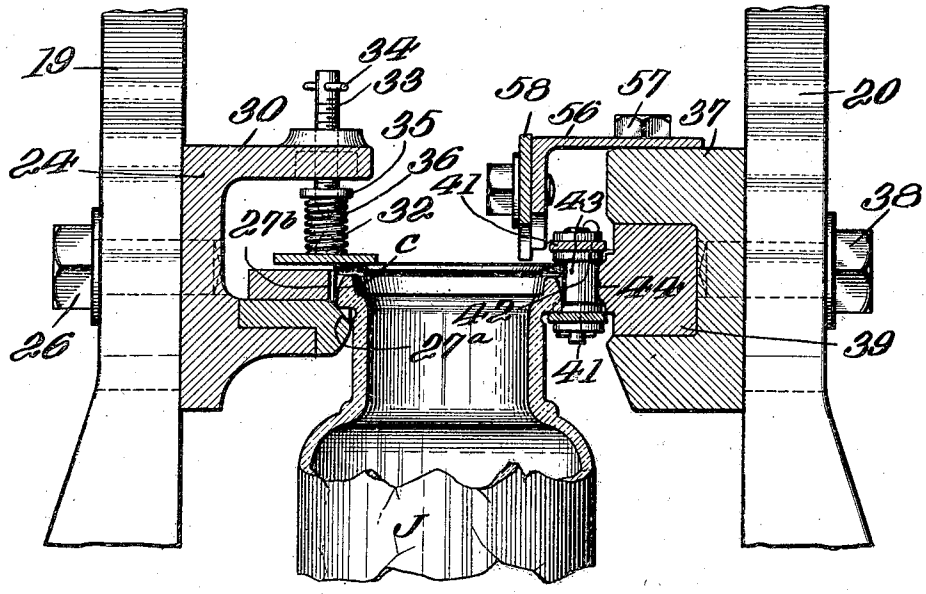
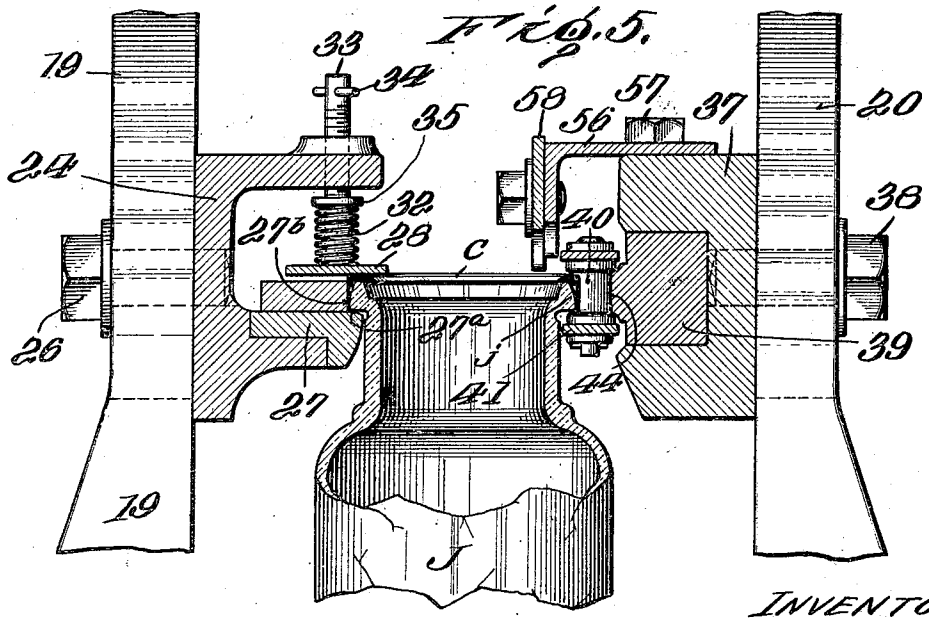


FIG. 5.



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T. L. TALIAFERRO

JAR CLOSING MACHINE

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FIG. 9.

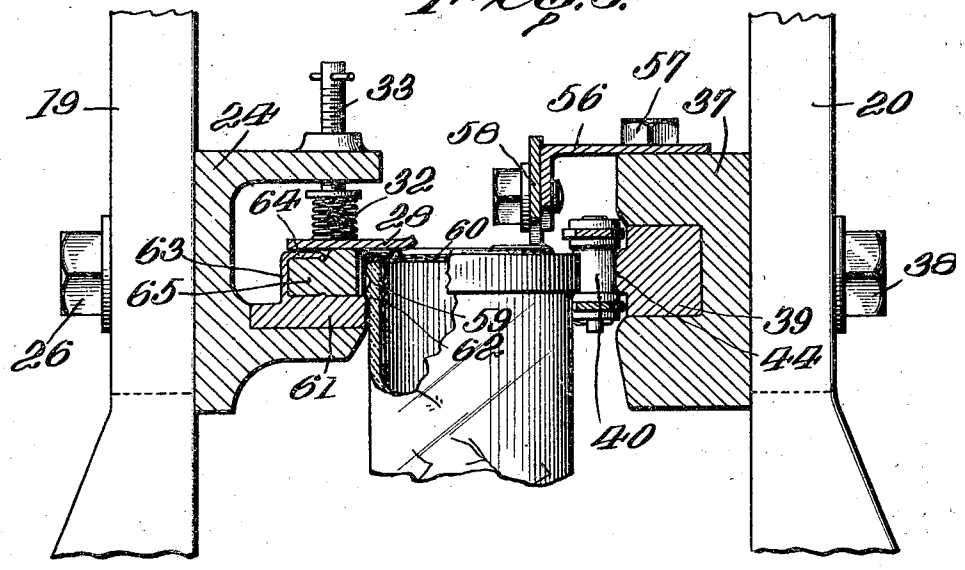
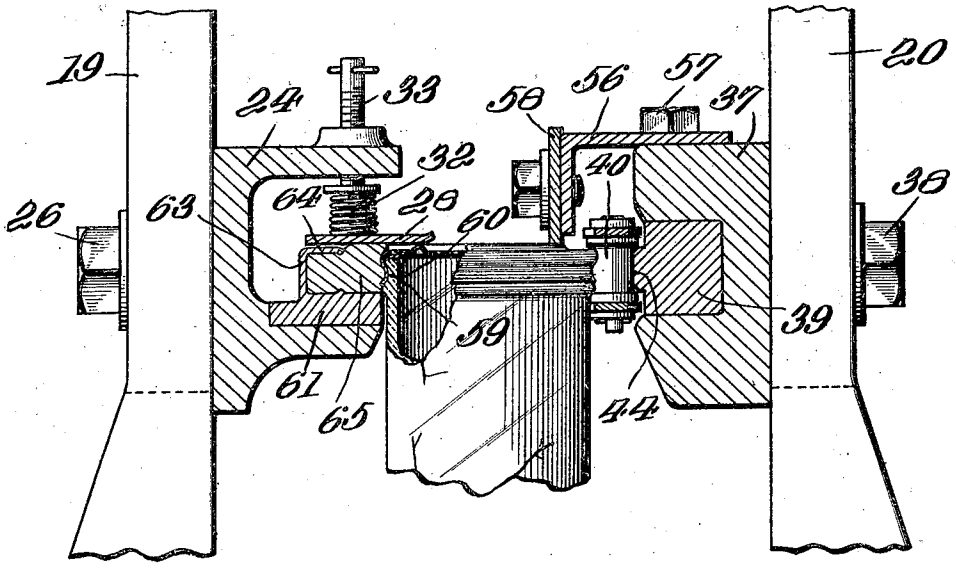


FIG. 10.



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Patented May 27, 1924. 1,495,650

UNITED STATES PATENT OFFICE.

THOMAS LUCIEN TALIAFERRO, OF CHICAGO, ILLINOIS.

JAR-CLOSING MACHINE.

Application filed December 29, 1920. Serial No. 433,796.

To all whom it may concern:

Be it known that I, THOMAS L. TALIAFERRO, a citizen of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Jar-Closing Machines, of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

The invention relates to new and useful improvements in jar closing machines, and more particularly to a machine for securing a metal cap to a glass or porcelain jar.

An object of the invention is to provide a machine through which the jars may pass continuously and in succession, which machine includes devices for reshaping the flange of the metal cap for securing the same to the jar and without stopping the movement of the jar.

A further object of the invention is to provide a machine of the above character wherein the jar, while the cap is being secured thereto, is supported by a flange at the mouth of the jar.

A further object of the invention is to provide means for delivering the jars with the caps loosely applied thereto to the closing means and providing said closing means with devices for supporting and conveying the jar during the closing operation on the cap.

A still further object of the invention is to provide a machine of the above character wherein the feeding and supporting devices of the closing means operate to rotate the jar so as to bring all parts of the cap into engagement with the devices for reshaping the flange.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings which show by way of illustration one embodiment of the invention—

Figure 1 is a plan view of a machine embodying my improvements;

Fig. 2 is a front view of the same;

Fig. 3 is a sectional view longitudinally through the machine on the line 3—3 of Fig. 1;

Fig. 4 is a sectional view on the line 4—4 of Fig. 3;

Fig. 5 is a sectional view on the line 5—5 of Fig. 3;

Fig. 6 is an enlarged detail view showing the closing devices, partly in plan and partly in section;

Fig. 7 is a detail of a portion of one of the feed chains;

Fig. 8 is a similar view, but showing a slightly modified form of feed chain;

Fig. 9 is a view similar to Fig. 4, but showing a modified form of cap bending means; and

Fig. 10 is a view similar to Fig. 5, but showing the same modified form of cap bending means as in Fig. 9.

The invention is directed broadly to a jar closing machine for securing metal caps to glass or porcelain jars and consists of means for feeding the jars with the caps loosely applied thereto, in succession and continuously into the closing means, and for receiving and feeding the jars out of the machine after they have been closed. The closing means includes a continuously traveling device for engaging a jar at the mouth thereof, which traveling device serves the double function of conveying a jar through the machine and rotating it as it moves through the machine. Said traveling means also aids in the supporting of the jar by the lip or flange formed in the mouth of the jar. Cooperating with this continuously traveling means is a cam supporting and closing rail which presses the cap on to the jar, supports the jar by the lip or flange at the mouth thereof and turns the flange underneath the lip or flange in the preferred embodiment of the invention. Through this closing means the cap is securely attached to the mouth of the jar, and while the jars are moving through the machine. Referring more in detail to the drawings, my invention is shown as embodied in a machine consisting of a support or base 1 on which is mounted standards 2, 2, and rigidly secured to these standards is a supporting table 3. At the receiving end of the table there are brackets 4 having bearings for a shaft 5 on which is mounted a belt wheel 6. These brackets are also provided with bearings for the main shaft 7 of the machine. Said main shaft is driven by a suitable belt wheel 8. The main shaft carries a gear 9 shown in broken lines in Fig. 1, which meshes with a

gear 10, similarly shown, and secured to the shaft 5, thus the belt wheel 6 is driven. At the delivery end of the machine there is a bracket 11 in which is journaled a shaft 12 carrying a belt wheel 13. A belt 14 runs over these belt wheels. At the receiving end of the table 3 there is a roller 15 and the belt instead of going over the top of the table 3 runs over this roller and thence underneath the table. There is a roller 16 at the rear end of the table and a roller 17 carried by bracket arms 18 which directs the belt underneath the table and free from contact with the table. This belt serves as a conveying means to carry the jars forward on to the table 3 and receive the jars at the delivery end and carries the jars away from the table.

Mounted on the table are two upright spaced standards 19 and 20. The standard 20 is secured to the table by means of bolts 21 and is held in fixed position by these bolts. In the base of the standard 19 there are slots 22, 22, through which bolts 23, 23 extend, and these bolts serve to clamp the standard 19 in adjusted positions. Mounted on these standards 19 and 20 are the closing devices which reshape the metal in the flange of the cap so as to cause it to be secured to the mouth of the jar. These closing devices in the preferred form of the invention are constructed as follows: Attached to the standard 19 is a rail 24 which extends longitudinally of the machine. The standard 19 is in the form of two uprights, each of which is provided with a slot 25 and bolts 26 passing through these slots and threaded into the rail 24 serve as a means for supporting the rail so that it may be adjusted vertically and held in various adjusted positions. Mounted on this rail 24 is a supporting and forming cam 27. Said cam consists of a lower member having a supporting ledge 27^a and an upper member having a vertical face 27^b. The supporting ledge 27^a inclines upwardly at the receiving end as indicated at 27^c. This incline is quite steep until the point 27^d is reached, and from this point to the end of the supporting cam, the incline gradually approaches a horizontal so that the inclination is very gradual from 27^d on to the end of the cam. Directly above the cam 27 is a presser plate 28. Said presser plate is carried by rods 29, 29. These rods extend upwardly through the overhanging part 30 of the rail 24 and nuts 31 are threaded on to the upper end of the rods. These serve as a support for the presser plate and limits its downward movement when there is no jar in the machine. The presser plate is provided with projecting studs 32 (see Fig. 4), and the overhanging part 30 is provided with bolts 33, each of which is provided with a cross bar 34 to aid in turning the same, and a fixed collar 35 which is back a slight distance from the end of the bolt. A spring 36 is placed between the presser plate and the collar 35 and is held in place through the joint action of the stud 32 and the end of the bolt 33. There are three springs shown in the drawings, and these springs serve to yieldingly force the presser plate downwardly. At the other side of the machine from the rail 24 there is a second rail 37 which is secured to the standard 20 by means of bolts 38. This standard 20 also consists of two uprights which are slotted so as to permit the rail 37 to be raised and lowered. Mounted in the rail is a bar 39. Traveling along the face of the bar 39 is an endless chain 40. Said endless chain consists of a series of links 41 connected by pins 42, and on the pins between each pair of links is a sleeve or roller 43. As shown in Figures 1 to 7, inclusive, these rollers are spool shaped while the rollers as shown in Fig. 8 are cylindrical. The face of the bar 39 is shaped as indicated at 44 so that the chain engages said shaped face as an abutment, slides along said bar 39 and will be held in a straight line of travel by the spool engaging the face of the bar 39. This chain serves to feed the jar during the closing operation, and said chain runs over the sprocket wheel 45 at the receiving end of the machine, the sprocket wheel 46 at the delivery end of the machine and an idle sprocket wheel 47 carried by the arm 48 pivoted at 49. Said arm carries a bolt 50 extending through a segment slot 51 on the bracket plate 52, and by means of this bolt 50, the arm 48 may be rigidly clamped in proper position to take up the slack in the chain. The sprocket wheel 45 is splined to a shaft 52′. This shaft 52′ carries a bevel gear wheel 53 at its lower end which meshes with a bevel gear wheel 54 on the shaft 5.

The jars with the caps loosely applied thereto are received on to the traveling belt 14 and will be directed against the traveling chain 40 by means of a guide rail 55. This traveling chain together with the belt will carry the jar on to the supporting cam 27. The parts of the machine are so adjusted that the distance between the traveling rollers of the endless chain and the face 27^b of the closing cam, is substantially the diameter of the mouth of the jar, plus the thickness of the metal in the flange of the cap, with sufficient clearance to permit the ready travel of the jar to cause said jar to rotate as it passes through the machine. In other words, the rollers 43 are capable of rotating so that their engagement with the flange of the cap is only sufficient to convey the jar and cause the jar to rotate and the jar will rotate on the supporting and closing cam 27. As shown in Figures 4 and 5, the jar indicated at J is provided with a lip or flange *j*. The metal cap indicated at C is

provided with a depending straight flange *c*. It is desired to roll the lower end of this flange on the cap underneath the lip or flange on the mouth of the jar. As the jar enters the machine, the inclined portion of the cam 27 between the points 27^c and 27^d will gradually raise the jar off from the supporting table. This cam face will also gradually turn the extreme lower edge of the flange *c* of the metal cap underneath the lip or flange at the mouth of the jar. The presser plate 28 yieldingly holds the cap from upward movement and as the jar is raised by this support at the lip or flange of the mouth of the jar, the extreme lower portion of the flange of the cap is tucked underneath the lip or flange on the jar. At the opposite side of the machine from the presser plate there is a supporting bracket 56 which is secured to the rail 37 by bolts 57. Said bracket carries an adjustable plate 58, which overlies the top of the cap and holds the same on the mouth of the jar at the side thereof adjacent the traveling chain during the closing operation.

From the above it will be apparent that the jars are supported by the lip or ledge at the mouth of the jar and therefore, if the jars vary slightly in height, they will not be crushed or injured in any way as they pass through the machine. It will also be noted that the reshaping of the flange which secures the cap to the jar occurs while the jar is traveling through the machine and without in any way stopping the bodily movement of the jar. The traveling chain causes the jar to rotate so that all parts of the depending flange are brought into contact with the stationary cam supporting and closing ledge. It will also be noted that the jars may travel, one directly behind the other, through the machine, and the fact that one closing operation is just being finished does not interfere in any way with the closing operation on the next following jar.

The supporting rails may be readily adjusted vertically to accommodate jars varying considerable in height, that is, when going from one type or size of jar to another, but no adjustment whatever is necessary to take care of slight variations in the size of jars of the same capacity. The standard 19 can also be quickly shifted laterally to take care of jars of different diameters at their mouths.

In Figures 9 and 10 I have shown a slightly modified form of closing cam to be used in connection with a jar cap of a different type. In this type of jar, the mouth of the jar is provided with a depression 59, and the cap indicated at 60 is preferably of aluminum or some very soft material which can be readily reshaped. The closing cam ledge is differently constructed, otherwise the machine is the same in detail as described above. In this form of the invention, the cam ledge 61 is carried by the rail 24 and supports the jar by a ledge 62 at the mouth of the jar. Said cam ledge 61 is provided with an upwardly extending flange 63 which is turned inwardly at 64 to form a pocket in which is placed an elastic rail 65. This elastic rail is adapted to engage the vertical outer face of the flange of the metal cap 60. The pressure of the presser plate 28 and of the jar, due to the traveling chain 40 engaging the opposite side of the cap causes this elastic rail 65 to bear against the flange with sufficient pressure to reshape the soft metal, that is, to force a section of the flange into the depression 59 and thus secures the cap to the jar as clearly shown in Fig. 10.

It will be understood of course, that various shapes of cam ledges may be used for closing jars having caps of different characters. The essential feature of the invention consists in the use of a stationary cam ledge to reshape the flanges of the cap, together with the means which properly supports the jar, rotates the jar, and carries it along the cam ledge, and holds the cap and jar so as to bring about the proper reshaping of the flange of the cap to secure it to the mouth of the jar.

One of the essential advantages of my machine consists in the capability of taking the jars promiscuously and untimed, one after the other, thus doing away with all chucks and timing devices which have heretofore been used. It will be obvious that my improved machine may be used in connection with vacuum closing if desired.

It is obvious that minor changes in the details of construction and the arrangement of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters-Patent, is—

1. A jar closing machine including in combination, spaced devices for supporting a jar through the medium of a ledge at the mouth of the jar and with a cap loosely applied thereto, one of said supporting devices including means for seating the cap on the jar and for rolling the edge of the cap underneath the ledge of the jar, and means for advancing the jar through the machine.

2. A jar closing machine including in combination, spaced devices for supporting a jar through the medium of a ledge at the mouth of the jar and with a cap loosely applied thereto, one of said supporting devices including means for seating the cap on the jar and for rolling the edge of the cap underneath the ledge of the bar, and

the other supporting device including means for turning and advancing the jar.

3. A jar cap closing machine including in combination, yielding devices for holding the cap on the jar and for turning the edge of the cap underneath the ledge on the jar, and means for rolling the jar along said devices.

4. A jar cap closing machine including in combination, yielding devices for engaging the upper face of the closure for forcing the cap down on to the jar and for turning the edge of the cap underneath the ledge on the jar, and means for rolling the jar along said devices.

5. A jar cap closing machine including in combination, yielding devices for engaging the upper face of the closure for forcing the cap down on to the jar and for turning the edge of the cap underneath the ledge on the jar, and means for rolling the jar along said devices, said devices for turning the cap underneath the ledge of the jar being disposed so as to support the jar while the cap is being attached thereto.

6. A jar cap closing machine including in combination, devices operating to reshape the flange of the cap as the jar is moving for securing the cap to the jar, and means for feeding the jar with the cap loosely applied thereto along said devices whereby the rolling of the jar in connection with said devices will turn the edge of the cap underneath the ledge on the jar said reshaping devices including yielding sections.

7. A jar closing machine including in combination, a traveling chain having rollers for engaging the flange of a metal cap, in place on a jar, devices cooperating with said chain for engaging the flange at the opposite side of the mouth of the jar from said chain for reshaping the flange for securing the cap to the jar.

8. A jar closing machine including in combination, a traveling chain having rollers for engaging the flange of a metal cap, in place on a jar, devices cooperating with said chain for engaging the flange at the opposite side of the mouth of the jar from said chain for reshaping the flange for securing the cap to the jar, said cooperating devices including a spring presser plate for holding the cap yieldingly on the jar.

9. A jar closing machine including in combination, a traveling chain having rollers for engaging the flange of a metal cap in place on a jar, devices cooperating with said chain for engaging the flange at the opposite side of the mouth of the jar from said chain for reshaping the flange for securing the cap to the jar, said cooperating devices including a spring presser plate for holding the cap yieldingly on the jar, said cooperating devices including a cam shaped supporting ledge for engaging the lip or flange of the jar, for receiving and supporting the jar and for turning the flange of the cap underneath the flange at the mouth of the jar.

10. A jar closing machine including in combination, a horizontally disposed endless traveling conveyor having a series of rollers for engaging the flange of a metal cap applied to the mouth of a jar, means along which said conveyor travels adapted to support the conveyor and hold said conveyor in a horizontal line, devices for engaging the flange of the metal cap at the opposite side of the jar from said chain, said devices being adapted to turn the lower portion of the flange of the cap underneath the flange or lip at the mouth of the jar for securing the cap to the jar.

11. A jar closing machine including in combination, a horizontally disposed endless traveling chain having a series of rollers for engaging the flange of a metal cap applied to the mouth of a jar, means along which said chain travels adapted to support the chain and hold the chain in a horizontal line, devices for engaging the flange of the metal cap at the opposite side of the jar from said chain, said devices being adapted to turn the lower portion of the flange of the cap underneath the flange or lip at the mouth of the jar for securing the cap to the jar, said devices also operating in conjunction with the chain to support the jar during the reshaping of the flange of the cap.

12. A jar closing machine including in combination, a horizontally disposed endless traveling chain having a series of rollers for engaging the flange of a metal cap applied to the mouth of a jar, means along which said chain travels adapted to support the chain and hold the chain in a horizontal line, devices for engaging the flange of the metal cap at the opposite side of the jar from said chain, said devices being adapted to turn the lower portion of the flange of the cap underneath the flange or lip at the mouth of the jar for securing the cap to the jar, a yielding presser plate engaging the upper face of the cap for holding the same in proper cooperative position with said devices for turning the flange.

13. A jar closing machine including in combination, spaced parallel rails, a feed chain traveling horizontally along one of said rails, means carried by the rail in rear of the chain and serving as an abutment for the chain whereby said chain is caused to travel in a straight line while passing said abutment, a flange carried by said rail cooperating with the chain and disposed directly above the cap on the jar, a cam ledge associated with the other rail and adapted to engage the side face of the flange and the lower portion of the flange for turning the same underneath the lip or flange at the

mouth of the jar, a spring presser plate associated with said last-named rail and bearing upon the upper face of the cap for holding the cap in proper position relative to the jar during the turning of the flange.

14. A jar closing machine including in combination, spaced parallel rails, a feed chain traveling horizontally along one of said rails, means carried by the rail in rear of the chain and serving as an abutment for the chain whereby said chain is caused to travel in a straight line while passing said abutment, a flange carried by said rail cooperating with the chain and disposed directly above the cap on the jar, a cam ledge associated with the other rail and adapted to engage the side face of the flange and the lower portion of the flange for turning the same underneath the lip or flange at the mouth of the jar, a spring presser plate associated with said last-named rail and bearing upon the upper face of the cap for holding the cap in proper position relative to the jar during the turning of the flange, said cam ledge for turning the flange being constructed so as to cooperate with the chain in supporting the jar by the ledge or lip at the mouth of the jar during the closing operation.

15. A jar cap closing machine including in combination, devices for supporting the jar by a ledge at the mouth thereof, for forcing the cap on the jar, and for turning the edge of the cap underneath the ledge, and means for rolling said jar on said devices.

In testimony whereof, I affix my signature.

THOMAS LUCIEN TALIAFERRO.