Aug. 20, 1963 W. R. KING ETAL 3,100,957

MACHINE FOR EMBOSSING CONTAINER LIDS AND PLACING THEM ON CONTAINERS

Filed July 1, 1960 4 Sheets-Sheet 1

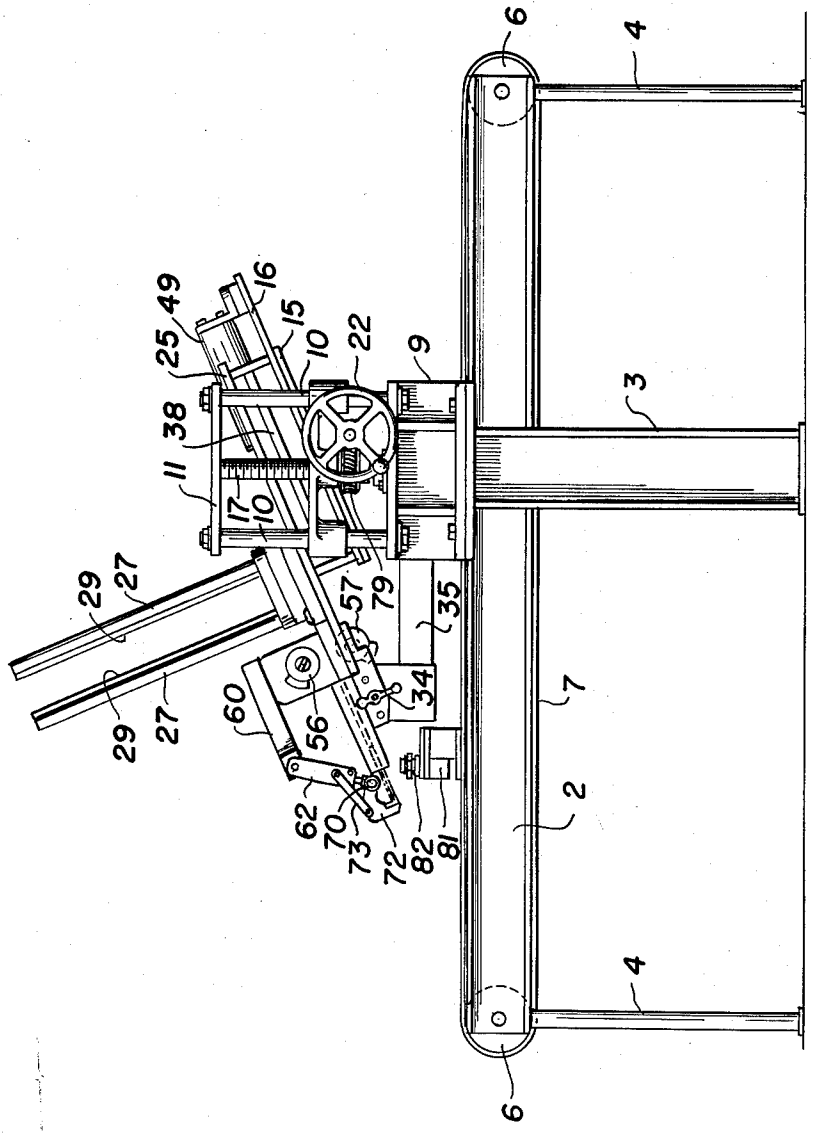

Fig. 1.

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Fig.2.

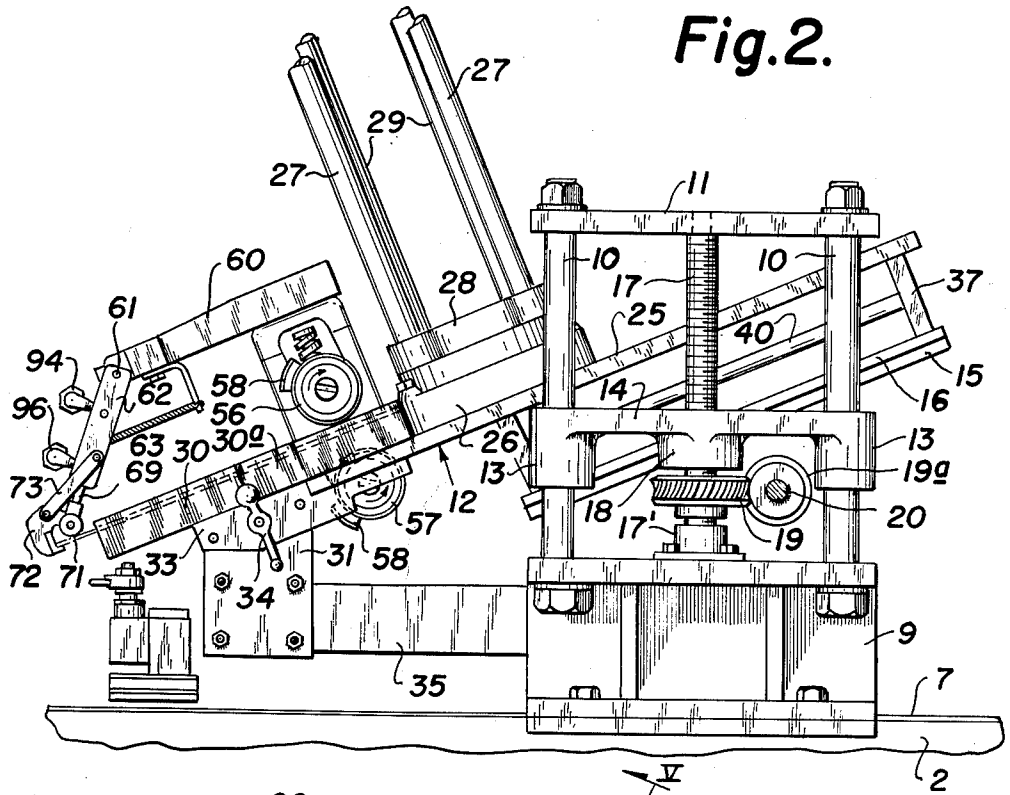

Fig.3.

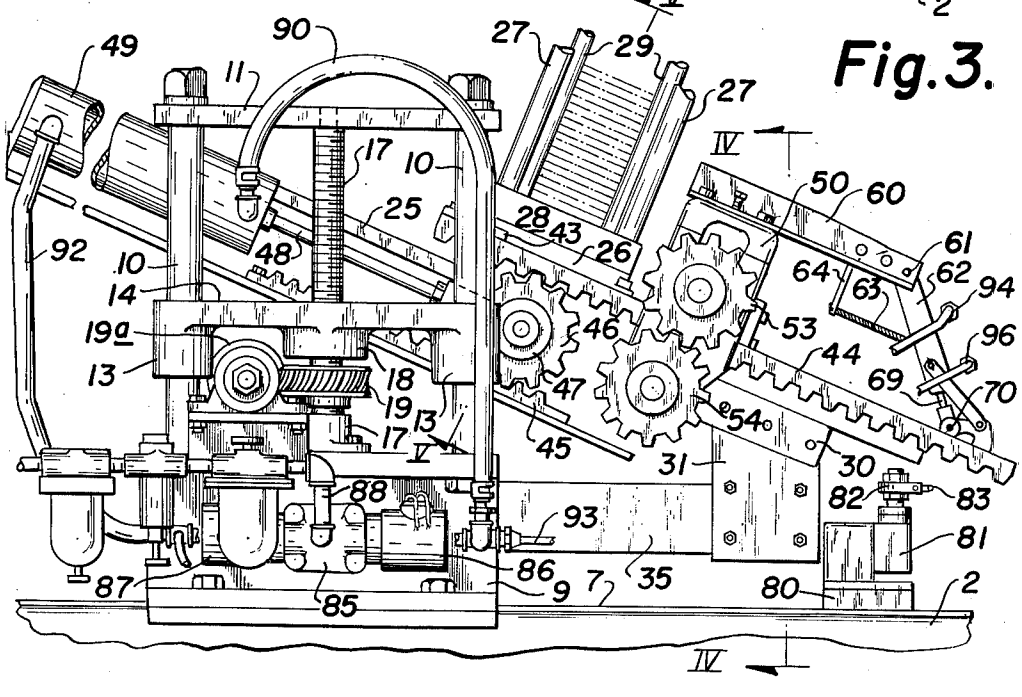

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Fig. 4.

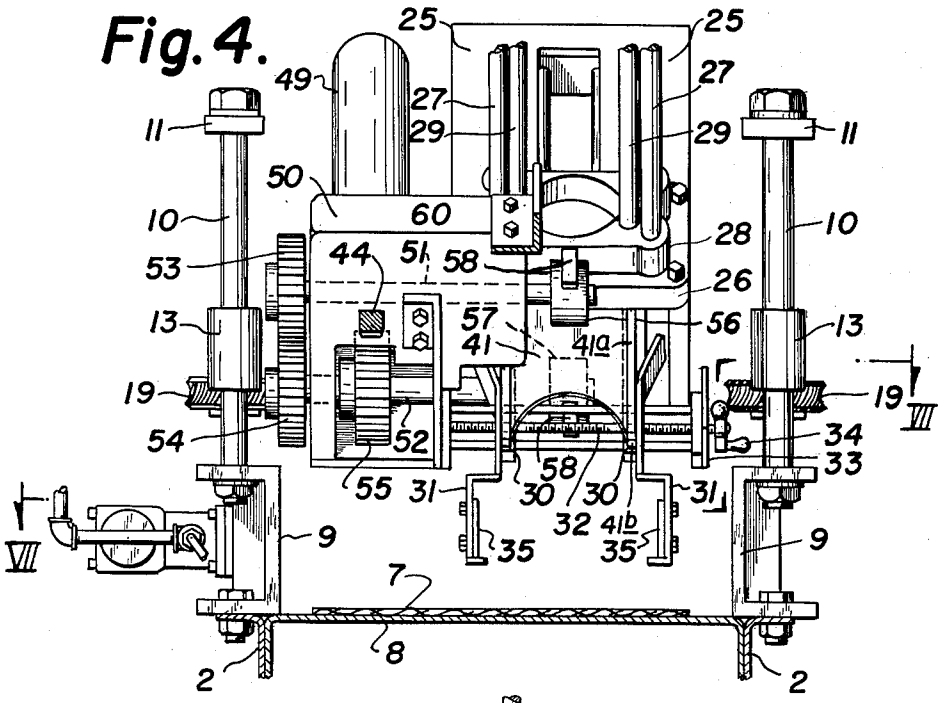


Fig. 5.

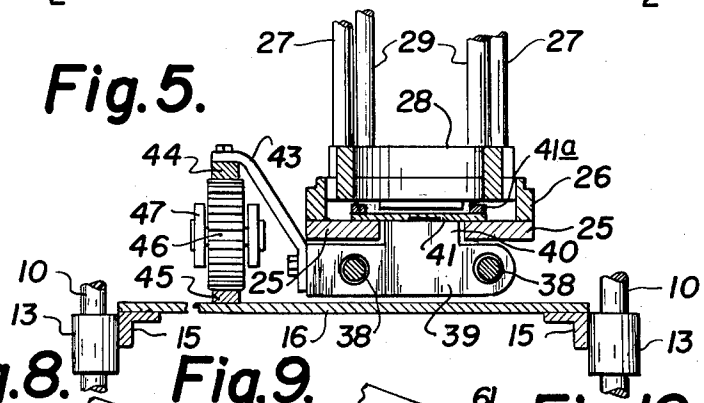


Fig. 8.

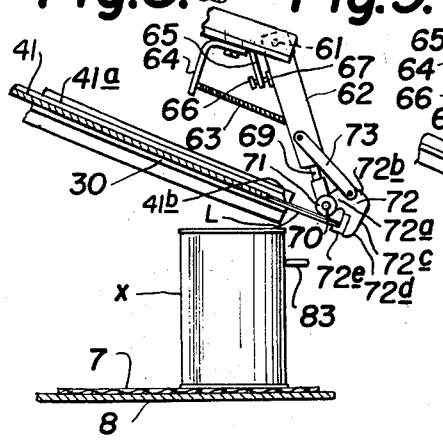


Fig. 9.

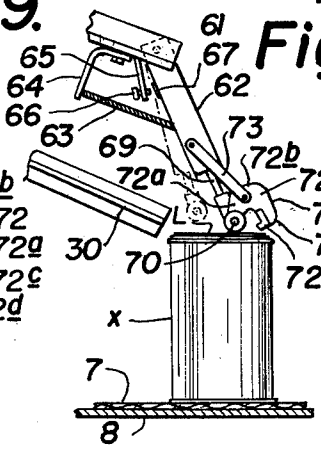
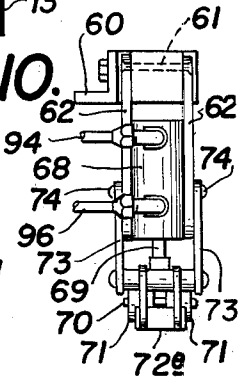


Fig. 10.



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MACHINE FOR EMBOSSING CONTAINER LIDS AND PLACING THEM ON CONTAINERS

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Fig.6.

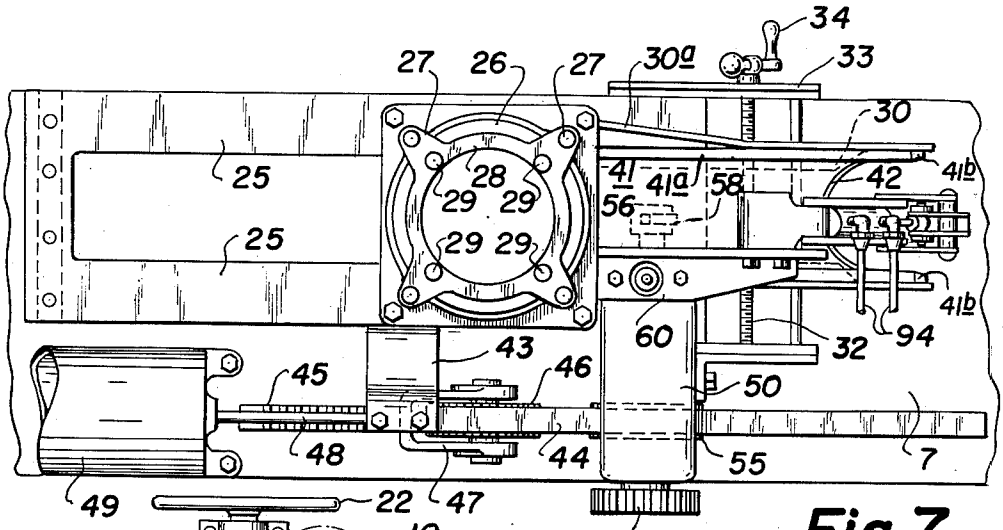
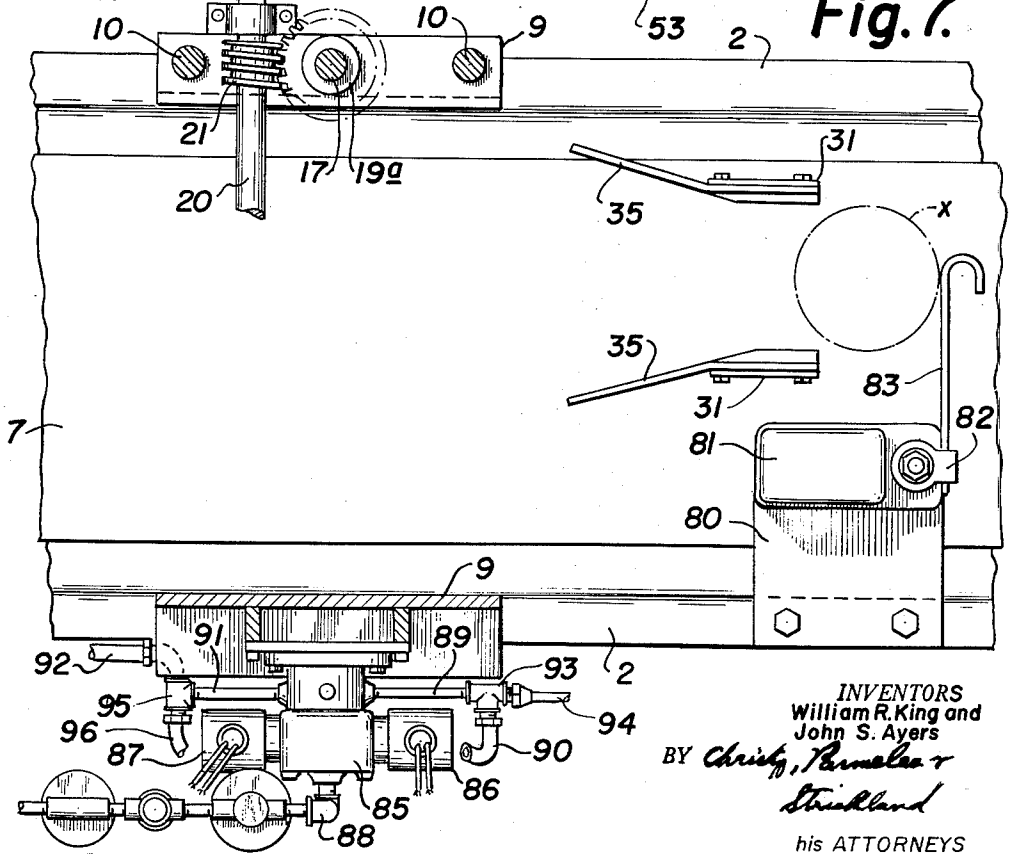


Fig.7.



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3,100,957

MACHINE FOR EMBOSSING CONTAINER LIDS AND PLACING THEM ON CONTAINERS

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Filed July 1, 1960, Ser. No. 40,456
14 Claims. (Cl. 53—67)

This invention is for a machine for applying a marking to the lids of containers and then positioning the lids on filled containers.

In many industries, particularly those employing metal chime cans, as for example the paint industry, it is customary to impress or emboss certain information, such as a code number and date, onto the lid of the container, so that the manufacturer may subsequently identify the filled can with a particular batch of product or time of manufacture. It is of course desirable that the filling of the cans, the marking of the lids, and their application to the container occur in immediate sequence to avoid any mix-up of lids and product, as well as to simplify subsequent handling of the containers. It is desirable, moreover, to emboss the lids only as they are required and thereby avoid the waste incident to embossing a number of lids in advance and ending the run with a surplus of embossed lids for which there is no use, or the delay incident to having more lids embossed if the estimated number is not sufficient.

In the present invention there is provided a machine comprising a conveyor onto which filled cans are placed and carried away from the filling station. Elevated over this conveyor there is a magazine for holding a supply of can lids. Sensing means, responsive to the travel of cans or other containers beneath this mechanism, effects the removal of a single lid from the magazine, moving the lid so removed between embossing rollers where the desired marking is impressed in the lid, and then centering the lid over the path of travel of the cans, and at the proper time, dropping the embossed lid into position on a can while pressing it down to thereby retain it in place. The machine is sometimes referred to as an "in-line can lid embosser," for the reason that the lids are embossed as required and applied to the cans as they are carried away from the filling machine and before a label is applied to the can. It is of course important that every can receive a lid and that the lid be accurately positioned on the cans, since the spilling of the contents, especially when the cans are subsequently rolled over to receive their labels, can cause a considerable loss of time and annoyance.

The present invention has for its principal object to provide a machine of unique construction for successively feeding the lids one at a time, embossing each lid, and positioning it on a filled container.

A further object of the invention is to provide a machine of this character which is fast, positive, and which accurately positions the lids on the containers.

A further object of the invention is to provide a machine of this character which will operate with different sizes of containers and lids of different diameters.

These and other objects and advantages are secured by our invention, as will hereinafter more fully appear from the following detailed description of a machine constructed in accordance with our invention and in conjunction with the accompanying drawings. In the drawings:

FIG. 1 is a general side elevation of one side of a machine embodying our invention;

FIG. 2 is a side elevation on a larger scale than FIG. 1 showing the mechanism of this invention in greater detail;

FIG. 3 is a view similar to FIG. 2 of the other side of the machine;

FIG. 4 is a transverse vertical section in the plane of line IV—IV of FIG. 3;

FIG. 5 is a similar section in the plane of line V—V of FIG. 3;

FIG. 6 is a partial top plan view of the apparatus shown in FIGS. 2 and 3, and for clarity of illustration the magazine is viewed as being vertical;

FIG. 7 is a broken horizontal section in the staggered line VII—VII plane of FIG. 4, with certain parts shown in elevation;

FIG. 8 is an enlarged side elevation of the can lid holding detent at the lid delivery end of the apparatus with the detent in retracted or lid-holding position;

FIG. 9 is a view similar to FIG. 8 showing the detent in extended or tripped position; and

FIG. 10 is a front elevation of the machine shown in FIG. 8.

In the drawings, 2 designates the side frames of a conveyor bed or table supported between its ends by structural sections 3 constituting the main support, and at each end by lighter columns 4. At each end of the frame is a transverse roller 6 and an endless conveyor belt 7 passes around these rollers. The roller at one end may be driven in any conventional manner from a source of power (not shown). The top reach of the conveyor is about flush with the top of the conveyor frame, and is supported on a table 8.

Secured to the side frame members 2 at each side of the machine and directly above the columns 3 are short channel sections 9 having their flanges turned outwardly and the web vertical. Mounted near each end of these sections are vertical guide rods or posts 10. The posts 10 at one side of the machine are connected at their tops by a cross bar 11, and at the other side by a similar cross bar, also designated 11.

These posts comprise supports for a vertically-adjustable bridge or cross frame, designated generally as 12, and comprised of four sleeves 13, one sleeve being slidable on each post 10. The two sleeves at each side of the machine are connected to each other by a cross bar 14, which is horizontal, and by sloped angle frame member 15 which is welded to bar 14. A deck plate 16 is supported on these two angles. The angles 15 and the deck plate 16 slope downwardly toward the discharge end of the conveyor, which moves toward the left as viewed in FIG. 2.

There is a vertical screw 17 between the two posts 10 at each side of the machine, the lower end of the shaft 17 being in a bearing 17′ on the top flange of the channel section 9. The vertical screw shaft at each side of the machine passes through a nut 18 on the horizontal bar 14. Each shaft 17 has a worm gear wheel 19 keyed to the lower end portion thereof. There is a cross shaft 20 mounted in bearings on the top flange of sections 9 with worm gears 21 at each end engaging the pinions 19a, while one end of the shaft is provided with a hand wheel 22. By turning the hand wheel 22, both screw shafts 17 may be rotated simultaneously to raise or lower the bridge or cross frame through the engagement of nuts 18 with the threads on the respective shafts 17. The vertical adjustment enables the apparatus to be adjusted to cans or other containers of different heights.

Spaced above the inclined deck or plate 16 and parallel with it are parallel flat heavy ways or rails 25 which are spaced from each other (see FIG. 5) leaving a longitudinally-extending space between them. These plates or rails 25 have bolted thereto the base block 26 of a lid holder or magazine. This block, as best seen in FIG. 5, is essentially an annulus of an internal diameter such that the largest lid to be handled may drop therethrough

onto the rails 25. There are four posts 27 equidistantly mounted in the block 25 around the annulus to receive and hold a stack of the largest size lids which the machine will accept, and keep them centered over the annulus. For smaller lids a second annulus 28 is set on block 26 in concentric relation thereto, and it carries four equidistantly-spaced posts 29 for holding a stack of lids centered over annulus 28. This second annulus is removed when the larger lids are being marked, but the drawings show the machine set for use on the smaller size of containers.

When a lid is pushed from the bottom of the magazine in the manner hereinafter described, it must be guided to position to be applied to a can, and in moving to such position it is embossed. For supporting the lid as it is being so moved, there is a guideway which may be adjusted to the width of the diameter of the lids being applied. For this purpose, as best seen in FIGS. 2 and 4, there is a guide member 30 at the lower end of each rail 25 which, at its lower end, is of angle section. The lateral leg of the angle section is flush with rail 25, while the vertical leg forms a guide flange. This flange has an upper portion 30*a* at the upper end of the member 30 which extends over the rail 25 and angles upwardly and outwardly from the center to provide an easy entrance for the lids into position in the guide. Each guide 30 has an offset plate 31 depending therefrom. A screw shaft 32, reversely threaded at each side of its center, has threaded engagement with each of these plates. One end of the shaft has a bearing in a bracket 33 fixed to one of the rails 25, and there is a hand crank 34 for turning the screw shaft to move the members 30 toward or away from each other a distance necessary to allow a can lid of the size being operated upon to slide between the two guides while supported on the lateral flanges of these guides.

Each depending plate 31 also constitutes a support for a can guide 35 (see FIGS. 4 and 7). The two guides, one at each side of the center of the conveyor belt, are located above the belt, and their rear ends diverge to provide a flaring entrance between them, so that can X, shown in dotted lines in FIG. 7, being carried along on the belt, is brought to a central position on the belt between the guides. For larger cans, the guides are further apart, and since there is a direct relation between the diamter of the can and the diameter of the lid, the single adjustment provided by crank 34 and screw shaft 32 adjusts the lid guides 30 and can guides 35 at the same time. The can guides 35 of course raise and lower with the bridge structure, but since larger cans are usually also taller, raising the bridge to accommodate taller cans also raises can guides 35 to engage taller cans higher up on the sides of the can, which is a deisrable condition.

There are fixed transverse supports 37 between the deck plate 16 and the rails 25, and two longitudinally-extending guide rods 38 are mounted in these supports, one at each side of the center. There is a reciprocable transverse cross head 39 (see FIG. 5) slidable on the guide rods 38. It has a central projection 40 that extends up between the rails 25. Secured to the top edge of this projection is an inclined pusher plate 41 (see FIG. 6) that slides on the rails 25, and which has a curved lower edge 42. This plate moves from the position shown in FIG. 6 to the left, up the rails 25 to a point where the curved edge 42 is clear of the opening through the lid-holding magazine, whereupon the stack of lids will drop down onto the rails 25 with the lowermost lid in the magazine in front of the pusher plate. The rails 25 and the associated guides form a chute extending beneath the magazine along which the pusher moves from a normal position below the embossing rolls to a retracted position back of and clear of the magazine. The pusher plate has a rail 41*a* along each edge of the top surface terminating in wedge-shaped points 41*b*. When the pusher first moves down, the points 41*b* will separate

the bottom lid from the overlying ones, and lift the stack of lids in the magazine while the bottom one, thus separated from those above, is then pushed by contact with the curved edge 42 of the pusher from under the magazine.

The cross head 39 has a laterally-extending plate 43 attached thereto, the outer end of which is bolted to one end of a gear rack 44 so that reciprocation of the rack moves the cross head and pusher plate 41 up and down the ways or rails 25. There is a lower gear rack 45 bolted to the deck 16 directly below the rack 44 (see FIG. 3). A pinion 46 is disposed between the two racks and its teeth mesh with both racks. This pinion is carried in a yoke 47 at the end of piston rod 48. This rod has a piston that works in a cylinder 49 bolted to the deck plate 16, by means of which the pinion is moved up and down along the fixed rack 45. Rack 45 causes the gear pinion 46 to rotate so that the rack 44 is caused to travel in the same direction as the pinion is moving.

Carried on the vertically-movable frame 12 is a casing 50 that supports two parallel shafts 51 and 51 (see FIGS. 4 and 6) that extend crosswise of the machine, and which have gears 53 and 54 respectively that mesh with each other so that they rotate in opposite directions. The lower shaft 52 has a pinion 55 thereon, the teeth of which mesh with the movable gear rack 44 that passes through the casing 50. The inner ends of these shafts are down slope from the lid-holding magazine. The upper shaft has an embossing die holder 57 thereon, these die holders carrying type or marking dies 58. The plane of rotation of the dies is in the plane of the longitudinal center of the line of travel of the pusher, and the center of the space between the guides 30. One of the die holders is located above the plane of a lid supported on the ledges of the guides 30, and one below.

The arrangement is such that when the pusher moves a lid from the magazine onto the guides 30, the marking dies will be simultaneously rotated by the rack 44, the die then rotating in the direction of the arrows in FIG. 2. The lid is pushed to a point where the dies on the two holders will start to mark the lid near the center of the lid. The dies, moving together, emboss a marking in the lid. The rotary die holders are themselves of the type disclosed in prior Patent No. 2,358,674, granted September 14, 1944. They are constructed so that they may be readily removed from their respective shafts for the easy replacement of the marking dies. Their normal position is shown in FIG. 2. They rotate nearly 360° from this position, and then their rotation is reversed when the rack 44 moves in the opposite direction, but when the rack 44 is retracting to move the pusher up the ways 25, there is then no lid between the dies.

The pusher 41 follows the lid through between the embossing dies which have then rotated out of marking position, to shove the lid to the lower end of the guide. At the lower end of the guide there is a detent or trip mechanism against which the lid is pushed. This comprises a rigid supporting arm 60 secured to the top of the casing 50. Pivoted on a pin 61 at the outer end of this arm is a depending swinging arm 62 comprised of two parallel levers secured together to move as a single element. There is a tension spring 63 attached to this frame and to a fixed post 64 depending from the arm 60. It tends to pull the arm 62 toward the left as viewed in FIG. 3. There is a fixed bracket 65 on the under side of the arm 60 that carries a set screw 66 to contact a strap 67 on the back of the lever arm 62 to control the limit of movement of the arm 62 under the action of spring 63.

The swinging arm 62 supports a small vertical fluid pressure cylinder 68 that moves a rod 69 up and down. The lower end of the rod 69 carries a cross shaft 70 with a rubber-tired roller 71 at each end thereof. The cross shaft 70 also passes through one end of a specially formed yoke-shaped lever 72 having an upper arm 72*a* through the free end of which the shaft 70 passes, a vertical leg

72*b* and a return leg 72*c* under the leg 72*a*. The lever 72 is in the general form of a letter U turned sideways. A pair of links 73 are pivotally connected to this lever at the juncture of parts 72*a* and 72*b*, the opposite ends of these links being pivotally connected at 74 to the swinging arm 62. The free end of the lower leg 72*c* has a short tongue portion 72*d* thereon. A permanent magnet 72*e* may be set into the leg 72*c* at the back of tongue 72*d*. The normal position of the lever 72 is shown in FIG. 8, in which position the tongue 72*d* is in a position to just barely extend under the edge of a lid having its forward edge projected well beyond the guides 30, and its rear portion supported on the ends of the guides 30, as indicated by the lid L in FIG. 8. One function of the magnet 72*e* is to prevent the lid from rebounding for any reason when it strikes the detent.

when the rod 69 is driven down by fluid pressure, the detent lever 72 pivots about the ends of the links 73, the rollers 71 being thrust down and the tongue 72*d* moves from under the can lid, swinging in a vertical arc away from the lid to the position shown in FIG. 9. As the detent swings out, the can lid slides downwardly and forwardly to intersect the path of the top of the oncoming can. The lid will move by gravity, but the magnet 72*e*, if used, will initiate the movement of the lid more rapidly and positively. When the lid has been carried clear of the guide 30 and drops flat onto the can, the rollers 71 apply a pressure to the lid to press it onto the top of the can, and may also effect separation of the lid from the magnet. In this operation the arm 62 swings with the travel of the can against the tension of spring 63 to keep the rollers pressing on the lid. The forward edge of the can has only a slight free fall, if any, and its forward edge is in position on the can before the rear edge of the lid is clear of the guides 30. The lid is thus pulled and pressed into place with little free fall, and with pressure that prevents bounce or shifting of the cap on the can. The lid may then be tightly pressed on by a pressing roll (not shown), but the initial location of the lid on the can must be accurate or the succeeding pressure device will fail to close the can.

The operation of the device is initiated by the travel of the can under the apparatus. There is a bracket 80 on the conveyor frame (see FIG. 7) that supports a flag switch 81 of a well-known type that includes a member 82 that oscillates to operate the switch, and which carries a wire arm 83 that projects into the path of a can as it emerges from between the guides 35, the arm moving clockwise as viewed in FIG. 7 by the movement of the can past the arm.

At one side of the machine there is an air valve 85 that is operated to one direction by an electromagnet 86, and in the opposite direction by an electromagnet 87. This is a well-known type of four-way valve which has a pipe 88 connected thereto for supplying air under pressure to the valve. When electromagnet 86 is energized, the valve is moved to a position to supply air under pressure through pipe 89 and hose 90 to the lower end of cylinder 49 and open the opposite end of this cylinder to atmosphere. Moved in the opposite direction by electromagnet 87, air under pressure is admitted to the upper end of cylinder 49 through pipe 91 and hose 92, and vents the lower end of the cylinder to atmosphere.

Pipe 89 has a branch connection 93 that leads through hose 94 to the upper end of the little can lid-dropping cylinder 68, and pipe 91 has a branch 95 leading through hose 96 to the lower end of the cylinder 68.

When a can engages arm 83, moving this arm in a clockwise direction, the switch at 82 closes a circuit to magnet 86, sending air under pressure into the lower end of cylinder 49, moving the pinion 46 to the left as viewed in FIG. 3. This causes the rack 44 to move in the same direction to move the pusher plate 41 to a retracted position. The two die holders 56 and 57 are rotated, but in a direction opposite that indicated by the arrows in FIG. 2, but there is no lid between them at this time, and the pusher plate will be clear of the marking dies at the time they come opposite each other. At the same time an impulse of air is admitted to cylinder 68, pushing rod 69 down. This causes the detent to release the can lid that is already embossed and in position, so that it falls onto the can that has just actuated the switch. As the can moves away from the switch, arm 83 is moved back to its normal position under spring action built into the switch, thereby energizing electromagnet 87 to operate valve 85 to supply air to the upper end of cylinder 49 to drive the pinion 46 in the opposite direction. This drives the pusher plate 41 back down under the magazine, sliding a lid ahead of it, and as the center of the lid comes between the die holders 56 and 57 which are then rotating in the direction of the arrows and the dies engage the lid between them and emboss the marking in the lid, and the lid continues to be moved down the guides to the detent lever 72, which by that time has been moved back to normal position by an impulse of air from pipe 95 and hose 96 to the bottom of cylinder 68.

Thus as each can receives a lid, it causes a lid for the succeeding can to be removed from the magazine, embossed and brought to position to be placed on the succeeding can when it in turn trips the flag switch 81. In starting up the machine, the wire 83 may be initially moved by the operator so that a lid will be in place for the first can to pass through the machine.

A typical use for the machine is for applying lids to paint cans which are usually chime cans of pint, quart and gallon sizes. Each requires a different diameter of lid, and each is of different height. The magazine is changed for the lids of the required diameter. The bridge is raised to the proper level, and the guides 30 are adjusted to the diameter of the lid.

In use, a magazine suitable for the diameter of the lid to be used is placed on the base 26, or if the largest size lids are to be dispensed, the inner unit 28 is removed entirely. The hand wheel 22 is turned to raise or lower the frame 12, and all of the parts carried by it to an elevation where the top edge of the can on the conveyor belt will just about meet the leading edge of a lid having its lower end resting on the lip 72*d* of the trip 72. The crank 34 is turned to set the guides 30 the right distance for the diameter of the lid, the guides 30 in effect providing a bifurcated chute just wide enough to guide the lid. The proper marking dies 58 are placed in the rotary holder, and a stack of lids is placed in the magazine. Assuming that air under pressure is supplied through pipe 88, the machine is ready to operate. As stated above, the flag switch lever 83 may be manually operated when starting up to cause the lid pusher 41 to be retracted from under the magazine and then moved back down to its original position to push the lowermost lid from the magazine and move it between the dies in the rotating holders 56 and 57, with the die elements being rotated in timed relations to the movement of the pusher so as to impress their mark near the center of the lid, the operation of the dies thrusting the lid down the bifurcated chute provided by guides 30 until the lid is arrested by lever 72 and its leading edge supported on the tongue 72*d* against magnet 72*e*.

Cans from a filling line are supplied to the conveyor, and as each can moves under the overhead bridge structure, it is directed by guides 35 into a central position under the can chute. As each can in turn trips the switch lever 83, an impulse of air is supplied to the top of cylinder 68, tripping the lever 72 and withdrawing the tongue 72*a* from under the lip, while at the same time rollers 70 bear down against the lid and the lid, pressed onto the moving can, is carried from under the machine. At the same time that the lid is being applied, the pusher 41 is repeating its cycle of operation and the next lid is fed from the magazine, embossed and brought to position to

be applied to the next can when it in turn moves the switch arm **83**.

In this way, each can receives an embossed lid accurately positioned thereon so that the steps of filling, embossing the lids and applying the lid may immediately succeed each other. The machine operates with great rapidity, the complete cycle requiring but a fraction of a second of time, but with such accuracy that a lid that is in position to be applied to a can will be out of the chute before the next lid comes into position, so that the timing of the machine and the speed of the conveyor must be such that each can will move out from under the trip lever **72** with sufficient rapidity. Pressure regulators in the down air line **88** can be adjusted to reduce or increase pressure to the valve **85** to slow or increase the time cycle within such limits as may be required.

Since the chute provided by the guides **30** is parallel with the direction of travel of the cans, and in line with the travel of the cans, and is inclined toward the cans, as described, the operation proceeds smoothly and accurately.

It will be understood that we have shown and described in detail one embodiment of our invention but various changes and modifications may be made therein within the contemplation of our invention.

We claim:

1. Apparatus for embossing container lids and positioning them on containers comprising a magazine for container lids, a pusher movable back and forth under the magazine for removing lids from the bottom of the magazine, an inclined chute having an open center area down which the pusher moves each lid which it removes from the magazine, cooperating rotary embossing die rollers in the open central area of the chute between which each lid is moved by the pusher and between which the pusher moves in pushing the lids down the chute, the die rollers having mating embossing dies projecting from the periphery thereof at one location about the periphery, said rollers being geared to rotate together to bring the mating dies into confronting relation during rotation, a rack connected with the pusher for driving the rollers alternately in one direction and then the other as the pusher moves one direction or the other, the die elements being positioned to be out of confronting relation at all times the pusher is moving between the die rollers, a conveyor for moving containers in succession under the lower end of the chute in the same direction as the can lids are moved by the pusher, a trip for engaging the leading edge of each lid and arresting the motion of the lid at the lower end of the chute, and means controlled by the travel of the container under the chute for moving the trip from such engagement with the leading edge of the lid when the leading top edge of a container is in a position to receive the corresponding edge of the lid whereupon the lid and container move together and the trailing edge of the lid is moved clear of the chute.

2. Apparatus for embossing container lids and positioning them on containers comprising a magazine for container lids, a pusher movable back and forth under the magazine for removing lids from the bottom of the magazine, an inclined chute having an open center area down which the pusher moves each lid which it removes from the magazine, cooperating rotary embossing dies in the open central area of the chute between which each lid is moved by the pusher, means for driving the pusher and embossing rolls in unison to effect embossing of each lid as it is pushed along the chute, a conveyor for moving containers in succession under the lower end of the chute in the same direction as the can lids are moved by the pusher, means operated by each can in succession as they are carried under the chute by said conveyor for effecting an operation of the pusher and embossing rolls whereby the lids are embossed and moved into position as needed, a trip positioned over the path of travel of a lid moving off the chute with the terminal normally positioned to be contacted by the leading edge of each lid and arresting the motion of the lid at the lower end of the chute, said trip having a permanent magnet in the terminal portion positioned to attract the leading edge of the lid, means controlled by the travel of the container beneath the trip for moving said trip in a vertical plane away from the chute and moving the lid by magnetic attraction in the direction of travel of the container, and means on the trip for pressing the lid down away from the trip as it is being so moved in a vertical plane and applying it to the top of a container.

3. For use at the discharge end of a lid delivery chute of a container lid and marking and applying machine, a lever pivotally supported for movement in a vertical arc in a direction toward and away from the chute, a fixed support above the chute to which the lever is pivoted and from which the lever depends, a reciprocable rod on the lower end of the lever, means for reciprocating the rod, a lid-pressing roller at the lower end of the rod, a trip member pivotally carried on the lower end of the rod and pivotally supported to move in a vertical arc when the rod moves, the trip having a lid-supporting tongue that is moved by operation of the trip toward the chute when the rod moves up and away from the chute when the rod moves down.

4. For use at the discharge end of a lid delivery chute of a container lid and marking and applying machine, a lever pivotally supported for movement in a vertical arc in a direction toward and away from the chute, a fixed support above the chute to which the lever is pivoted and from which the lever depends, a reciprocable rod on the lower end of the lever, means for reciprocating the rod, a lid-pressing roller at the lower end of the rod, a trip member pivotally carried on the lower end of the rod and pivotally supported to move in a vertical arc when the rod moves, the trip having a lid-supporting tongue that is moved by operation of the trip toward the chute when the rod moves up and away from the chute when the rod moves down, the trip lever having a permanent magnet therein adjacent the tongue for attracting a metal can lid engaged on the tongue.

5. For use at the discharge end of a lid delivery chute of a container lid and marking and applying machine, a lever pivotally supported for movement in a vertical arc in a direction toward and away from the chute, a fixed support above the chute to which the lever is pivoted and from which the lever depends, a reciprocable rod on the lower end of the lever, means for reciprocating the rod, a lid-pressing roller at the lower end of the rod, a trip member pivotally carried on the lower end of the rod and pivotally supported to move in a vertical arc when the rod moves, the trip having a lid-supporting tongue that is moved by operation of the trip toward the chute when the rod moves up and away from the chute when the rod moves down, said lever being biased to swing toward the chute, and means for limiting its swinging movement in the direction of the chute.

6. For use at the discharge end of a lid delivery chute of a container lid and marking and applying machine, a lever pivotally supported for movement in a vertical arc in a direction toward and away from the chute, a fixed support above the chute to which the lever is pivoted and from which the lever depends, a reciprocable rod on the lower end of the lever, means for reciprocating the rod, a lid-pressing roller at the lower end of the rod, a trip member pivotally carried on the lower end of the rod and pivotally supported to move in a vertical arc when the rod moves, the trip having a lid-supporting tongue that is moved by operation of the trip toward the chute when the rod moves up and away from the chute when the rod moves down, said lever being biased to swing toward the chute, and means for limiting its swinging movement in the direction of the chute, the means

for reciprocating the rod being a fluid pressure cylinder carried on the lever.

7. Apparatus for embossing container lids and positioning them on containers comprising a magazine for container lids, a pusher movable back and forth under the magazine for removing lids from the bottom of the magazine, an inclined chute having an open center area down which the pusher moves each lid which it removes from the magazine, cooperating rotary embossing die rollers in the open central area of the chute between which each lid is moved by the pusher and between which the pusher also moves, a conveyor for moving containers in succession under the lower end of the chute in the same direction as the can lids are moved by the pusher, a trip for engaging the leading edge of each lid and arresting the motion of the lid at the lower end of the chute, means controlled by the travel of the container under the chute for moving the trip from such engagement with the leading edge of the lid when the leading top edge of a container is in a position to receive the corresponding edge of the lid whereupon the lid and container move together and the trailing edge of the lid is moved clear of the chute, other means controlled by the travel of the container for moving the pusher through a single cycle of back-and-forth movement to retract it from under the magazine and then move under the magazine to lift the stack of lids above the bottom lid and then push the bottom lid between the embossing dies, and means for driving the embossing dies concomitantly with the reciprocation of the pusher, the embossing die rollers having die elements thereon positioned to move into confronting relation with each other as the rollers rotate but so positioned that they are out of confronting relation at all times the pusher is moving between them.

8. Apparatus for embossing lids and placing them on filled cans comprising a conveyor for moving cans from a receiving end to a discharge end, a supporting structure over the conveyor having a chute positioned above the conveyor and sloping downwardly toward the discharge end of the conveyor but terminating above the conveyor at an elevation to clear a can moving under the chute, a magazine on the said supporting structure for holding a stack of lids, said magazine having an opening through its bottom through which the lids may drop, a pusher reciprocable under the bottom of the magazine from a lower position to a retracted position where it clears the bottom of the magazine to enable the lowermost lid to drop into position in front of the pusher and which pusher is movable to the normal position to move a lid positioned in front of it into the chute toward its lowermost end, a pair of cooperating roller marking dies positioned in the path of movement of the lid toward said end of the chute for engaging the opposite surfaces of the lid and embossing the same, a trip mechanism operable at the lower end of the chute for retaining the lid after it is embossed at the lower end of the chute in position to be placed on the top of a can when the can is moved to a position under the chute to receive the lid and for releasing the lid when the can reaches such position, and means effective in the path of movement of the cans and controlled by the movement of the cans for releasing a lid which is retained on the lower end of the chute and effecting a single cycle of operation of the pusher from its normal position to its retracted position and back to its normal position to replace the lid so released from the chute with another from the magazine, and means operatively connecting the embossing rolls and the pusher for rotating the rolls in timed relation to the pusher to effect embossing of each lid as it is moved along the chute to the trip mechanism.

9. Apparatus as defined in claim 8 in which the said structure positioned above the conveyor is vertically adjustable to accommodate cans of different height.

10. Apparatus as defined in claim 8 in which the said structure positioned above the conveyor is vertically adjustable to accommodate cans of different height and wherein the magazine has an adapter for receiving lids of smaller diameter than the maximum size which will pass through the opening at the bottom of the magazine, the chute having guides which are movable toward and away from each other for centering lids of different diameters.

11. In an apparatus for embossing container lids as defined in claim 1 wherein the lids are of the type in which each lid has a peripheral flange with an annular chime inwardly from the periphery, said magazine being constructed to hold a vertical stack of such lids, the chute extending beneath the magazine, said pusher being reciprocable from a position under the magazine to a retracted position clear of the magazine and then movable from the retracted position where it again passes under the magazine to an extended position, the chute holding the stack of lids when the pusher is retracted and the pusher supports the stack of lids when it is beneath the magazine and moved to extended position, the pusher having a pushing edge at one end thereof with spaced wedge-shaped points projecting therefrom in the plane of movement of the pusher, said wedge-shaped points being positioned to move over the flange of the lowermost lid in the magazine and lift the stack of lids in the magazine upwardly while confining the lowermost lid from upward movement, and when the stack of lids has been so lifted remove said lowermost lid as the pusher moves to extended position with the stack of lids in the magazine being then supported on top of the pusher.

12. Apparatus for embossing lids and placing them on filled cans comprising a conveyor for moving the cans from a receiving end to a discharge end, a supporting structure over the conveyor having a chute positioned above the conveyor and sloping downwardly toward the discharge end of the conveyor but terminating above the conveyor at an elevation to clear a can moving under the chute, a magazine on the said supporting structure for holding a stack of lids, said magazine having an opening through its bottom through which the lids may drop, a pusher reciprocable under the bottom of the magazine from a lower position to a retracted position where it clears the bottom of the magazine to enable the lowermost lid to drop into position in front of the pusher and which pusher is movable to the normal position to move a lid positioned in front of it into the chute toward its lowermost end, a pair of cooperating roller marking dies positioned in the path of movement of the lid toward said end of the chute for engaging the opposite surfaces of the lid and embossing the same, a trip mechanism operable at the lower end of the chute for retaining the lid after it is embossed at the lower end of the chute in position to be placed on the top of a can when the can is moved to a position under the chute to receive the lid and for releasing the lid when the can reaches such position, means effective in the path of movement of the cans and controlled by the movement of the cans for releasing a lid which is retained on the lower end of the chute and effecting a single cycle of operation of the pusher from its normal position to its retracted position and back to its normal position to replace the lid so released from the chute with another from the magazine, means operatively connecting the embossing rolls and the pusher for rotating the rolls in timed relation to the travel of the pusher to effect the embossing of each lid as it is moved along the chute to the trip mechanism, said last-named means comprising a fluid pressure operated piston and cylinder for moving the pusher, a reciprocable rack movable with the pusher, the embossing dies comprising holders each mounted on its own rotatable shaft with dies projecting from the periphery thereof, which dies are brought into confronting relation by rotation of the shafts when the lid is moving between them, and gearing on one of the die holder

carrying shafts engaging the reciprocable rack for rotating the die holders in timed relation to the movement of the pusher and in a direction such that the direction of rotation of the confronting surfaces of the dies urges a lid engaging therebetween toward the lower end of the chute, the aforesaid means controlled by the movement of the cans effecting the operation of said cylinder and piston.

13. Apparatus for embossing lids and placing them on filled cans comprising a conveyor for moving the cans from a receiving end to a discharge end, a supporting structure over the conveyor having a chute positioned above the conveyor and sloping downwardly toward the discharge end of the conveyor but terminating above the conveyor at an elevation to clear a can moving under a chute, a magazine on the said supporting structure for holding a stack of lids, said magazine having an opening through its bottom through which the lids may drop, a pusher reciprocable under the bottom of the magazine from a lower position to a retracted position where it clears the bottom of the magazine to enable the lowermost lid to drop into position in front of the pusher and which pusher is movable to the normal position to move a lid positioned in front of it into the chute toward its lowermost end, a pair of cooperating roller marking dies positioned in the path of movement of the lid toward said end of the chute for engaging the opposite surfaces of the lid and embossing the same, a trip mechanism operable at the lower end of the chute for retaining the lid after it is embossed at the lower end of the chute in position to be placed on the top of a can when the can is moved to a position under the chute to receive the lid and for releasing the lid when the can reaches such position, means effective in the path of movement of the cans and controlled by the movement of the cans for releasing a lid which is retained on the lower end of the chute and effecting a single cycle of operation of the pusher from its normal position to its retracted position and back to its normal position to replace the lid so released from the chute with another from the magazine, means operatively connecting the embossing rolls and the pusher for rotating the rolls in timed relation to the travel of the pusher to effect the embossing of each lid as it is moved along the chute to the trip mechanism, said last-named means comprising a fluid pressure operated piston and cylinder for moving the pusher, a reciprocable rack movable with the pusher, the embossing dies comprising holders each mounted on its own rotatable shaft with dies projecting from the periphery thereof, which dies are brought into confronting relation by rotation of the shafts when the lid is moving between them, gearing on one of the die holder carrying shafts engaging the reciprocable rack for rotating the die holders in timed relation to the movement of the pusher and in a direction such that the direction of rotation of the confronting surfaces of the dies tends to move a lid engaged therebetween in the direction in which it is moved by the pusher, and an electromagnetic valve connected with a fluid pressure supply line for first admitting fluid pressure to one end of the cylinder to retract the pusher and then admitting air to the opposite end of the cylinder to return the pusher to its normal position, the aforesaid means controlled by the movement of the cans comprising a switch means in the path of travel of the cans on the conveyor for operating said electromagnetic valve.

14. Apparatus for embossing lids and placing them on filled cans comprising a conveyor for moving the cans from a receiving end to a discharge end, a supporting structure over the conveyor having a chute positioned above the conveyor and sloping downwardly toward the discharge end of the conveyor but terminating above the conveyor at an elevation to clear a can moving under a chute, a magazine on the said supporting structure for holding a stack of lids, said magazine having an opening through its bottom through which the lids may drop, a pusher reciprocable under the bottom of the magazine from a lower position to a retracted position where it clears the bottom of the magazine to enable the lowermost lid to drop into position in front of the pusher and which pusher is movable to the normal position to move a lid positioned in front of it into the chute toward its lowermost end, a pair of cooperating roller marking dies positioned in the path of movement of the lid toward said end of the chute for engaging the opposite surfaces of the lid and embossing the same, a trip mechanism operable at the lower end of the chute for retaining the lid after it is embossed at the lower end of the chute in position to be placed on the top of a can when the can is moved to a position under the chute to receive the lid and for releasing the lid when the can reaches such position, means effective in the path of movement of the cans and controlled by the movement of the cans for releasing a lid which is retained on the lower end of the chute and effecting a single cycle of operation of the pusher from its normal position to its retracted position and back to its normal position to replace the lid so released from the chute with another from the magazine, means operatively connecting the embossing rolls and the pusher for rotating the rolls in timed relation to the travel of the pusher to effect the embossing of each lid as it is moved along the chute to the trip mechanism, said last-named means comprising a fluid pressure operated piston and cylinder for moving the pusher, a reciprocable rack movable with the pusher, the embossing dies comprising holders each mounted on its own rotatable shaft with dies projecting from the periphery thereof, which dies are brought into confronting relation by rotation of the shafts when the lid is moving between them, gearing on one of the die holder carrying shafts engaging the reciprocable rack for rotating the die holders in timed relation to the movement of the pusher and in a direction such that the direction of rotation of the confronting surfaces of the dies tends to move a lid engaged therebetween toward the lower end of the chute, an electromagnetic valve connected with a fluid pressure supply line for first admitting fluid pressure to one end of the cylinder to retract the pusher and then admitting air to the opposite end of the cylinder to return the pusher to its normal position, the aforesaid means controlled by the movement of the cans comprising a switch means in the path of travel of the cans on the conveyor for operating said electromagnetic valve, a fluid pressure cylinder for operating the lid-retaining and releasing trip, and fluid pressure connections between said valve and said last-named fluid pressure cylinder for supplying it with pressure to release the lid which it is engaging simultaneously with the supplying of air to the first cylinder to retract the pusher and to supply pressure to the trip-operating cylinder to return the trip to a lid-retaining position with the return movement of the pusher toward normal position.

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