Dec. 17, 1929. S. N. TEVANDER 1,739,875

MACHINE FOR SEALING CAPS TO JARS

Filed March 17, 1923 3 Sheets-Sheet 1

Fig. 4.

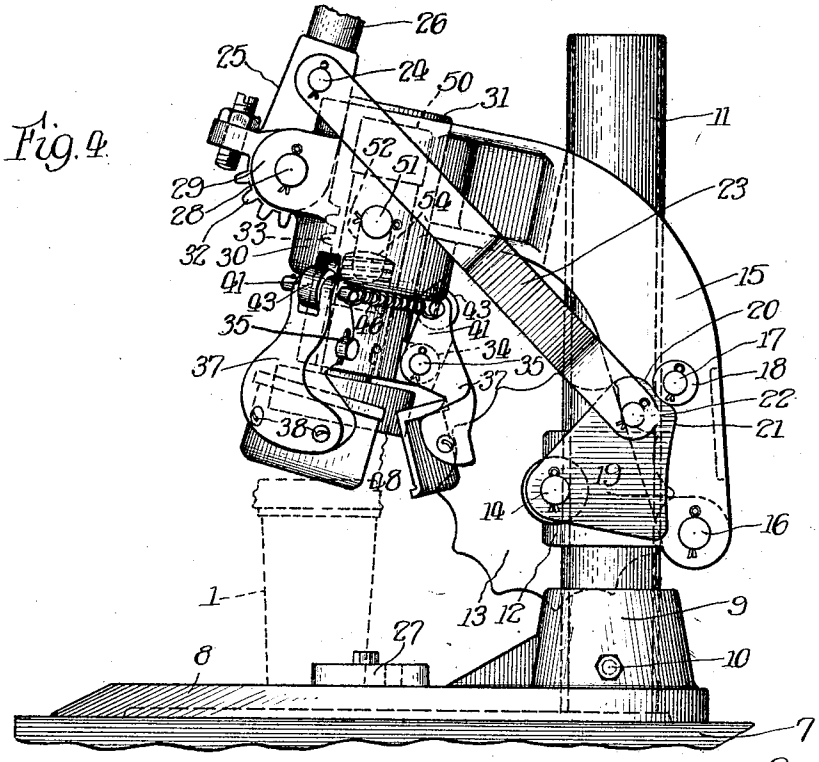


Fig. 5.

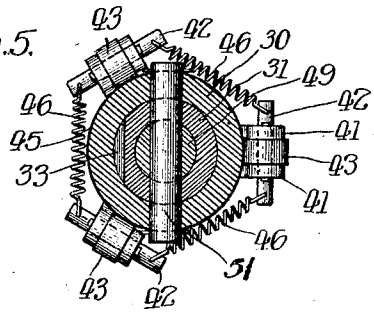


Fig. 6.

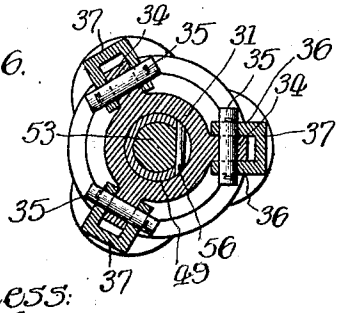


Fig. 1.

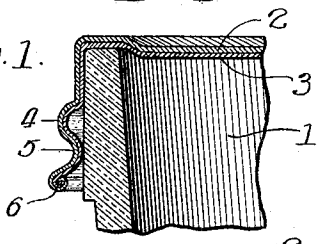


Fig. 2.

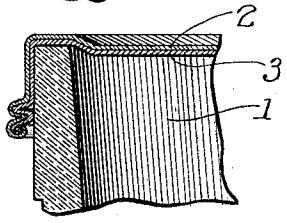
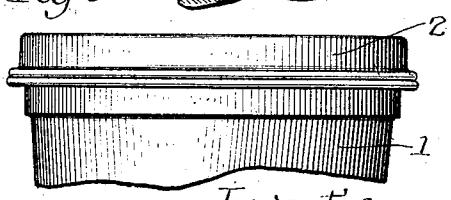


Fig. 3.



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Dec. 17, 1929. S. N. TEVANDER 1,739,875

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Filed March 17, 1923 3 Sheets-Sheet 2

Fig. 7.

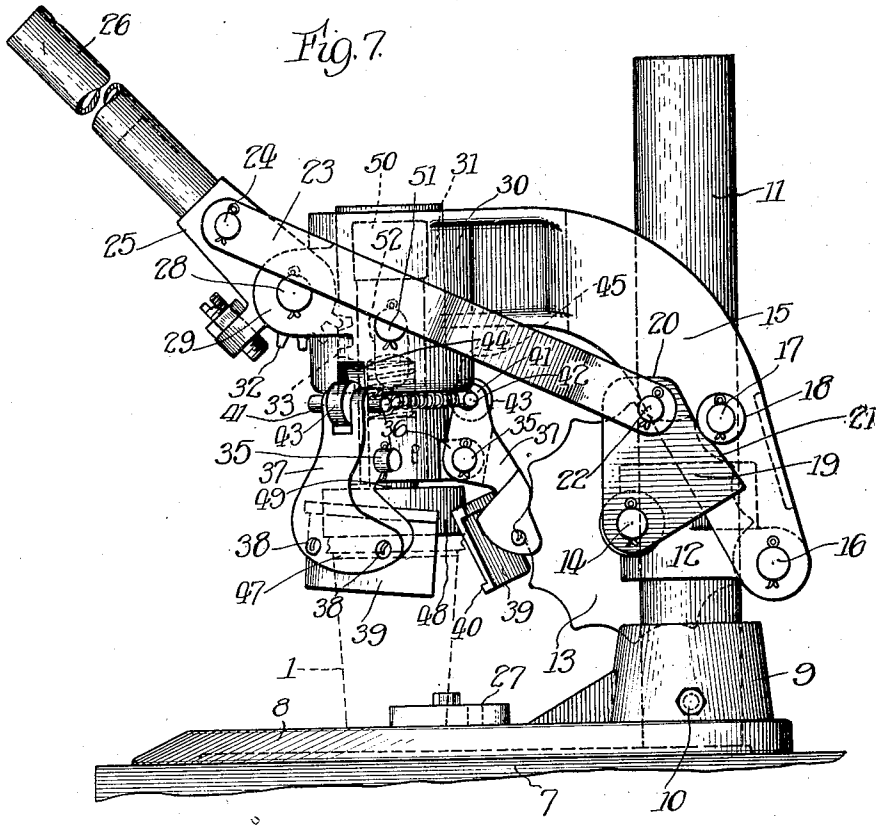
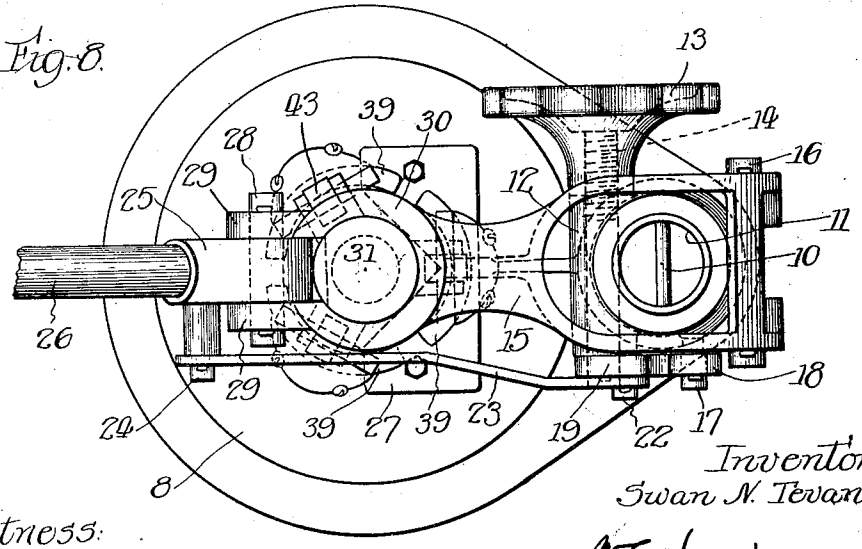


Fig. 8.



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Dec. 17, 1929. S. N. TEVANDER 1,739,875

MACHINE FOR SEALING CAPS TO JARS

Filed March 17, 1923 3 Sheets-Sheet 3

Fig. 9.

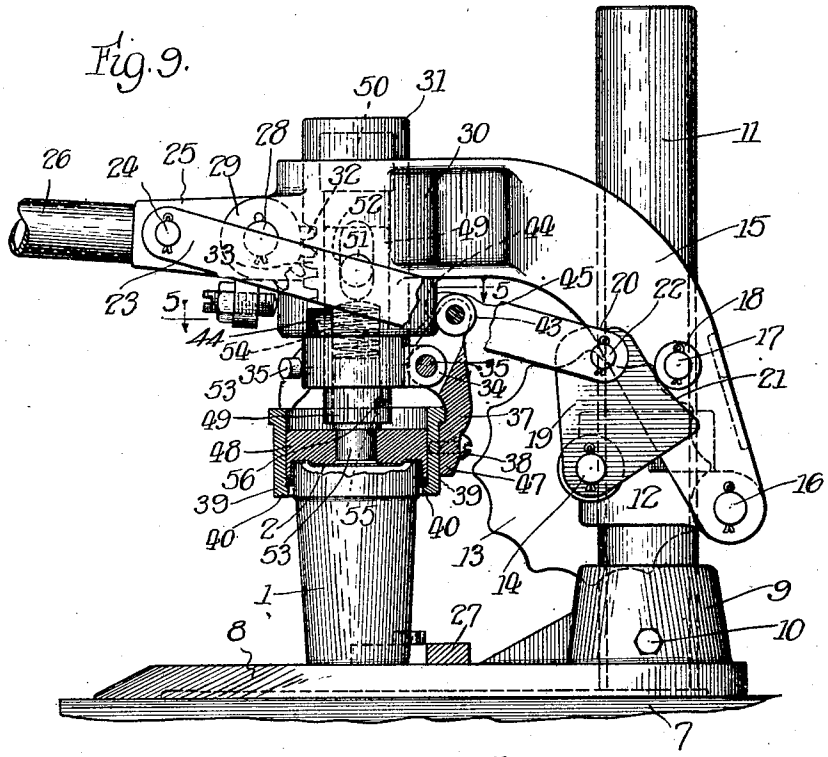
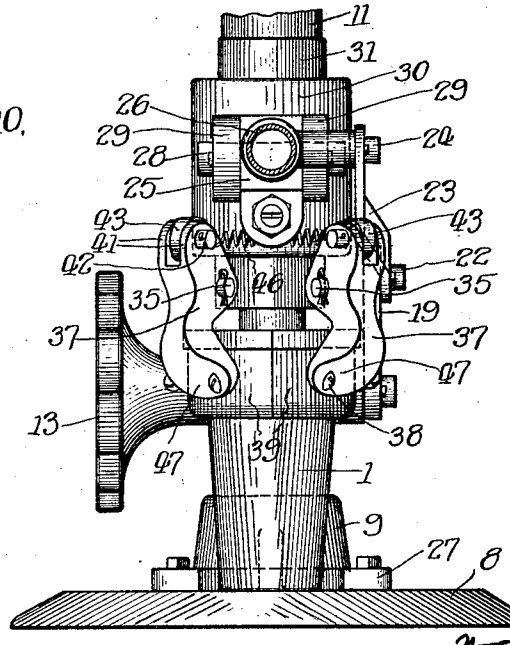


Fig. 10.



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Patented Dec. 17, 1929 1,739,875

UNITED STATES PATENT OFFICE

SWAN NILS TEVANDER, OF MAYWOOD, ILLINOIS, ASSIGNOR TO SWAN METALLIC SEAL & CAP COMPANY, A CORPORATION OF ILLINOIS

MACHINE FOR SEALING CAPS TO JARS

Application filed March 17, 1923. Serial No. 625,882.

The object of my invention is to provide a suitable machine that may be used on a bench and operated with a hand lever or other suitable means, for affixing caps to glass jars, cans, or other receptacles and the purpose of the invention is to furnish a neat, cheap, powerful and serviceable machine for this purpose.

The type of seal to be made of a cap is that of crimping up the ruffled or beaded flange on a cap on to the sides of a jar or can, the cap having been previously prepared and placed over the jars or cans to be operated on.

Reference will be had to the accompanying drawings in which Fig. 1 is a sectional detail view of the top of a jar showing a cap applied to the jar ready to be sealed. Fig. 2 is a similar view to that of Fig. 1 showing the parts sealed together. Fig. 3 is an elevation of the jar and cap sealed showing the finished work of the machine. Fig. 4 is a side elevation of the machine. Fig. 5 is a plan section on line 5—5 of Fig. 9. Fig. 6 is a section on a broken line passing through pins 35 and lugs 34. Fig. 7 is a similar view to that of Fig. 4 showing the head of the machine lowered on to the jar as the first step in the operation of the machine. Fig. 8 is a plan view of the parts shown in Fig. 7. Fig. 9 is a similar view to that of Fig. 7 but showing the completion of the operation of the parts and some of the parts being in section. Fig. 10 is a front elevation of the parts shown in Fig. 9.

In the drawing 1 indicates a jar here shown as a glass jar but may be a can or any other suitable receptacle. 2 indicates a metal cap, but the cap may be made out of any suitable material. 3 indicates a paper lining with which the inside of the cap is coated, but this lining may be of any suitable material.

The caps are previously formed and placed over the top of the jars and are provided with a convex bead 4 and a concave bead 5 and a turned over marginal edge 6.

The function of the machine is to change the form of the flange of the cap 2 as shown in Fig. 1 to the form shown in Figs. 2 and 3 and this action on the cap is brought about by the movement of the jaws of the machine in contact with the margin 6 and outer walls of the flange of the cap 2.

The machine is adapted to be mounted upon any suitable table or supporting means 7, and is provided with a base block 8 having a socket 9 into which there is fixed, by a screw 10 a vertical post 11. Mounted to be adjusted vertically as desired and held in any fixed position desired on the vertical post 11 there is provided a block 12 which may be clamped tightly in any fixed position to the post 11 through the medium of a hand clamping wheel 13 mounted to set and loosen a screw 14 and thereby clamp the block 12 in the position desired. The necessity for this adjustment arises from the different heights of glass jars or cans to which caps are to be affixed by the machine.

The mechanism which acts directly upon the cap is supported by an arm 15 which is hinged by a pin 16 to the block 12 and affixed in this arm 15 there is a pin 17 which carries a small roller 18 which works in contact with the cam block 19 hinged on the end of the aforesaid screw 14. This block 19 is provided with a cam track 20 and 21 in contact as desired with the roller 18 on the arm 15. This cam block 19 is hinged by a pin 22 to a link 23 hinged on a pin 24 to the socket block 25 of the operating lever 26. The cam block 19 thus in the position of Fig. 4 holds the arm 15 and the mechanism connected thereto in a stable upward position giving a clear way to the entrance of the glass or jar to be operated on after being seated in register on the base piece 8 against the registering block 27.

After the glass jar or can has been registered in position against the stop 27 on the table or base 8, the hand lever 26 is brought forward or to the left in Fig. 4 which moves the cam track 19 through the link 23 and allows the arm 15 to descend the roller 18 following the line of the cam surface 21 and thus allowing the arm 15 to move over to the position shown in Figs. 7 and 9 which is over the glass and cap to be operated upon.

The lever 26 with its socket 25 is hinged by a pin 28 to lugs 29 in the metal of the arm

15. The arm 15 is provided with a socket head 30 in which there is mounted a cylindrical hollow sliding block 31 which slides upward and downward vertically in the socket 30 of the arm 15 under the influence or the gear teeth 32 on the socket piece 25 of the lever 26. The gear teeth 32 mesh into the rack teeth 33 in this hollow sleeve 31 and thus by the movement of the lever 26 the sleeve block 31 is made to move upward and downward as desired.

The lower end of the block 31 is provided with the lugs 34 which carry pins 35 to which there are hinged by lugs 36 three lever arms 37 to each of which there is fastened by screws 38 a semicircular jaw 39 which is provided with the working shoulder 40. The upper ends of the levers 37 are provided with lugs 41 through which there pass pins 42 passing through small rollers 43 which rollers roll in contact with the cam surfaces 44 and 45 on the socket piece 30 of the arm 15. The cam surfaces 44 are shown in Figs. 4, 7, and 9 as beveled notches cut into the socket head 30 at its outer lower portion and would resemble a chamfer if made continuous. The cam surface 45 is the peripheral cylindrical surface of this socket head 30 above the notches 44 which merge into said cylindrical surface. The cam rollers 43 pass from the cam notches 44 to this surface 45 which thus serves as a neutral portion of a cam. A series of springs 46 hold the rollers 43 always in contact with the said cam surfaces.

Thus by the vertical movement of the lever 26 about its hinge pin 28 causes the gear teeth 32 to engage the rack teeth 33 of the sleeve block 31 and thereby move the block upward and downward carrying with it the levers 37 with their rollers 43 in contact with the cam surfaces 44 and 45 thus moving the lower ends 47 with the jaws 39 inward to a concentric position of the said jaws 39 as indicated in Fig. 9.

A head block 48 is mounted on a circular spindle block 49 which spindle block is entered in to a hollow cavity 50 of the hollow sleeve 31 and the vertical position of this spindle block 49 is maintained constant by reason of a pin 51 which passes through the walls of the socket 30 of the arm 15 and is affixed in the said walls and also in block 49 and this pin passes through a slot 52 in the sleeve 31 so that while the sleeve 31 may move upward and downward, the spindle block 49 stays substantially stationary as though it were a fixed part of the socket 30, and arm 15. Thus whenever the arm 15 is raised and lowered which is accomplished by the movement of the lever 26 and cam block 19 as before described the head block 48 goes with the said socket 30 and arm 15 in substantially a fixed relationship to those parts.

After a jar is inserted under the head block 48 of the machine against the registering block 27 on the base piece 8, the lever 26 is brought down from the position of Fig. 4 to that of Fig. 7 which then registers the head block 48 on the top of the cap substantially in a position of Fig. 9 and the position of the parts will then appear as in Fig. 7. Upon further movement of the lever 26 from the position of Fig. 7 to that of Fig. 9 there first takes place a movement of the rollers 43 up the cam tracks 44 to cam tracks 45. The cam tracks 44 move outward the rollers 43 which cause the lower ends of the lever arms 37 to swing inward carrying with them the jaws 39 to embrace the block 48 and the cap on the top of the jar. Then upon further upward movement of the rollers 43 they run over the cam surfaces 45, which are simply straight vertical surfaces or substantially one surface being the outside of the bead 30, and thus the lever arms 37 remain in position to hold the jaws 39 snugly around the head block 48 and the flange of the cap during the balance of the upward movement of the jaws and the parts to which they are connected. This results in bringing the shoulders 40 directly underneath the skirt 6 of the flange of the cap. Then upon further movement of the lever 26 from that of Fig. 7 to that of Fig. 9 the beads of the flange of the cap 2 are crimped up into the position indicated in Figs. 2, 3, and 9 forming the complete seal of the cap to the can.

The head block 48 is provided with a supporting spindle 53 which slides within the spindle block 49 before described and this spindle 53 within the block 49 is allowed a slight latitude of vertical movement within the spindle block 49 and a spring 54 is mounted in a cavity in the block 49 to always act in the direction of ejecting the spindle 53 from the spindle block 49 and the only movement permitted under the action of this spring 54 is that of the length of a small slot 55 in the spindle 53 controlled by a pin 56, see Figures 6 and 9. The purpose of this spring movement of the head block 48 and its spindle 53 is to provide an elastic cushion effect in seating the block 48 upon the top of the cap and jar when the parts are brought down from the position of Fig. 4 to that of Figs. 7 and 9.

Upon the completion of the sealing of the cap as indicated by Fig. 9 the return of the lever 26 to the position of Fig. 4 releases the parts for the sealed article to be removed and a new one replaced for another operation of the machine. Thus it will be seen that an operator may with great rapidity seal the caps onto tumblers, jars and cans as they are passed along on the table 7 which supports the machine.

What I claim is:—

1. In a machine of the class described, a head block adapted to rest on the top of a cap upon a receptacle, and mechanism for supporting the same in elastic relationship thereto, a series of gripping jaws adapted to em-

brace the said head block, and a cap upon which the said head block rests; in combination with a supporting base block table adapted to support the receptacle to which the cap is to be applied, a supporting post secured to the base member, an adjustable block arranged to be adjusted in different positions vertically on the supporting post, an arm hinged onto the said adjustable block and adapted to be raised and lowered over the the table which carries the receptacle to be capped, a cam hinged to the said adjustable block, a contact member mounted on the said arm and in engagement with the said cam, a hinge pin carried by said adjustable block, an operating lever hinged to the said arm and adapted to be rocked about its hinge pin center, a link mechanism for connecting said lever to the said cam for locking and releasing the position of the said arm about its hinge pin on the said adjustable block, said arm terminating in a socket head, a vertically moving sliding block mounted in said socket, inclined and vertically arranged cam tracks in the periphery of said socket head, gearing between the said operating lever and the said sliding block adapted to move the said block upward and downward in its supporting socket in the said arm, levers hinged to the said sliding block and provided at their upper ends with contact members adapted to engage the said cam tracks on the said socket of the said arm and carrying on their other ends the aforementioned gripper jaws, and the aforementioned head block and the supporting mechanism therefor supported by the said arm.

2. In a machine of the class described, the combination with a head block adapted to be mounted upon and hold in place a cap upon a vessel to be capped, an arm connected to said head block, an elastic connection between said arm and head block, a sliding block also carried by said arm, a hand lever hinged to said arm, gear and rack teeth for said lever and sliding block, respectively, cam tracks on said arm, levers hinged to said sliding block, a gripping jaw mounted on a lower end of each of said levers, a cam roller mounted on an upper end of each of said levers adapted to engage the said cam tracks on said arm and means connected to said hand lever for lowering and raising the said arm and connected parts.

3. In a machine of the class described, the combination with a supporting post, an arm hinged to said post and provided with a tubular socket, a tubular sliding block mounted in said tubular socket and carrying cap sealing means, an actuating lever hinged into the said arm, gear and rack teeth operatively connecting said actuating lever to the said tubular sliding block respectively, a cam adapted to raise and lower the said arm, a link connecting said cam and said actuating lever, a spindle block mounted on the interior of said sliding block, a pin secured in the walls of the socket of the said arm and passing through slots in the said tubular sliding block, a head block mounted on the lower end of said spindle block, concentric therewith and adapted to hold a cap on a vessel to be capped, a series of jaws carried by the said tubular sliding block and adapted to seal a cap held in place by the said head block.

4. In a device of the class described, an arm mounted and hinged over supporting means for a vessel to be capped, an operating lever, a hinged cam block linked to said lever and arranged to bear against said arm intermediate of its ends, a head block mounted in the said arm adapted to register on the top of a cap on a vessel to be capped, a sliding head carried by the said arm and movable in relation thereto, a plurality of cap engaging jaws pivotally mounted on said sliding head and means connected with the said arm and operated by the swinging of said lever for moving the said sliding head, the said jaws embracing and acting upon a flange of a cap when said sliding head is reciprocated.

5. In a device of the class described, an arm adapted to be lowered and raised in relation to the jar to be capped, a cam for controlling the movement of said arm, mechanism carried by the said arm adapted to seal a cap on a jar, a hand operated lever, means for operatively connecting the said sealing mechanism to said lever and means operatively connecting said lever to the said cam whereby an initial movement of the lever rocks said cam to permit the lowering of said arm, a further movement in the same direction operates the cap sealing mechanism, a reverse movement first releases the cap, and finally restores said arm and cam to the initial positions of the same.

6. In a device of the class described, an arm adapted to be lowered and raised in relation to a vessel to be capped, capping mechanism carried by said arm, a cam bearing against said arm at a point intermediate of its ends adapted to control the lowering and raising of the said arm, a lever hinged to the said arm and linked to the said cam whereby the swing of the lever simultaneously operates the raising and lowering of the said arm and the capping mechanism carried thereby.

7. In a machine of the class described, the combination with a supporting post, a block having a post clamp, an arm provided with cam faces for a plurality of lever arms and hinged to said block, a pivoted cam hinged to said block and adapted to support said arm at a point intermediate of the ends of the latter, a sliding head carried by and adapted to be reciprocated with respect to said arm, a plurality of lever arms pivotally mounted on said sliding head at points intermediate of

their ends each provided at one end with a cap engaging jaw having an inwardly extending rib at its lower margin and at an opposite end provided with a bearing for engaging with one of a plurality of cam faces of said arm, a head block concentric with said sliding head, an operating lever operatively connected with said sliding head to reciprocate said sliding head with respect to said arm and head block, and a link operatively connecting said operating lever and said pivoted cam.

8. In a machine of the class described, the combination with a flanged cap sealing mechanism comprising a plurality of levers each provided with a bearing roller at one end and the opposite end terminating in a flange engaging jaw, each lever being pivotally mounted intermediate of of its ends, a sliding head provided with rack teeth to which said levers are pivoted, a supporting arm for said head provided with cam faces for engaging said rollers, a block to which said arm is hinged provided with a post clamp, a supporting post, and an operating lever provided with terminal gear teeth for engaging said rack adapted to reciprocate said sliding head and also to compel said jaws to laterally hold and vertically compress beads on a flanged cap.

Signed at Chicago, in the county of Cook, and State of Illinois, this 14th day of March, 1923.

SWAN NILS TEVANDER.