Dec. 26, 1933. J. J. ENGELMAN 1,940,667

MACHINE FOR CLINCHING FRICTION COVERS TO CANS

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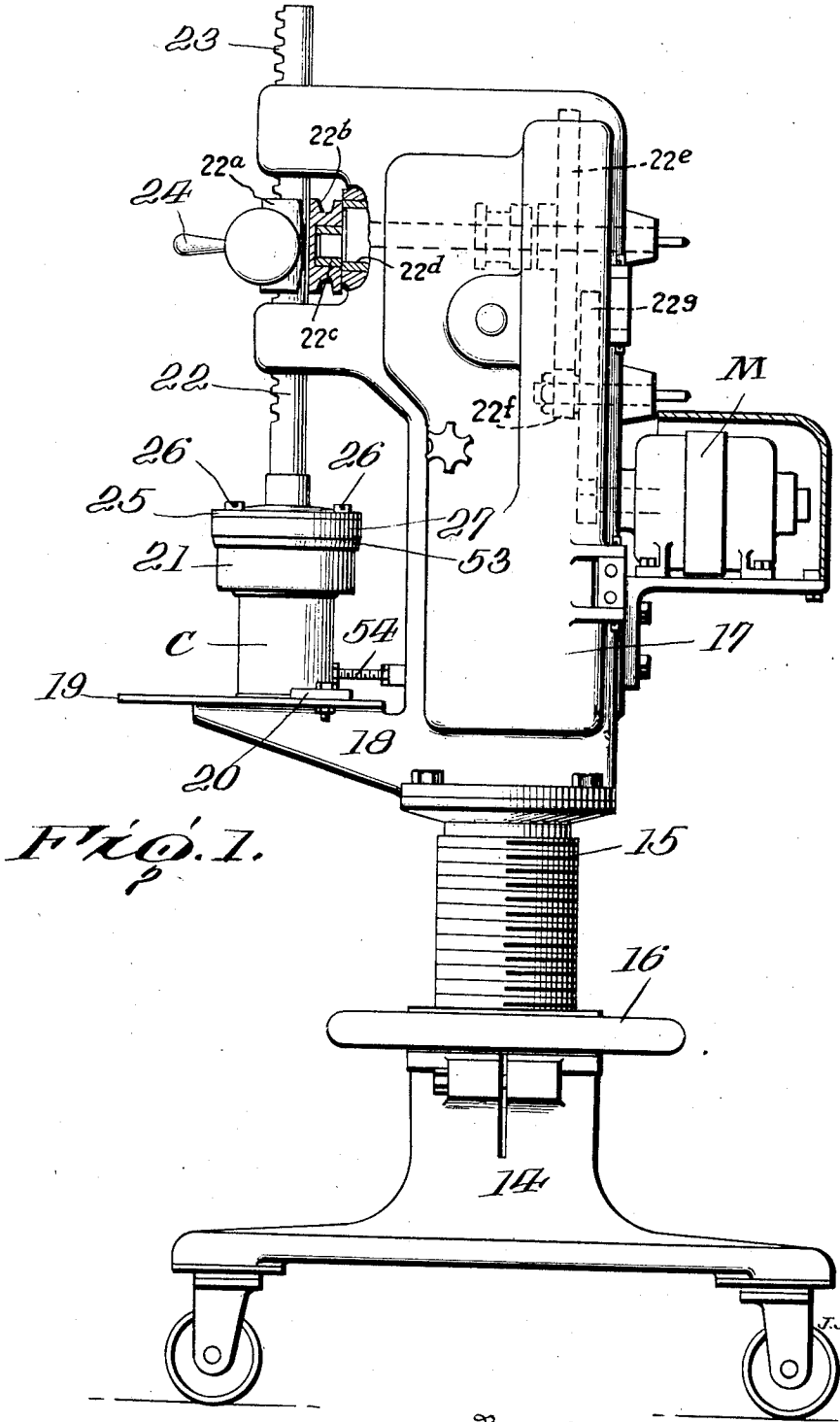


FIG. 1.

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Fig. 2.

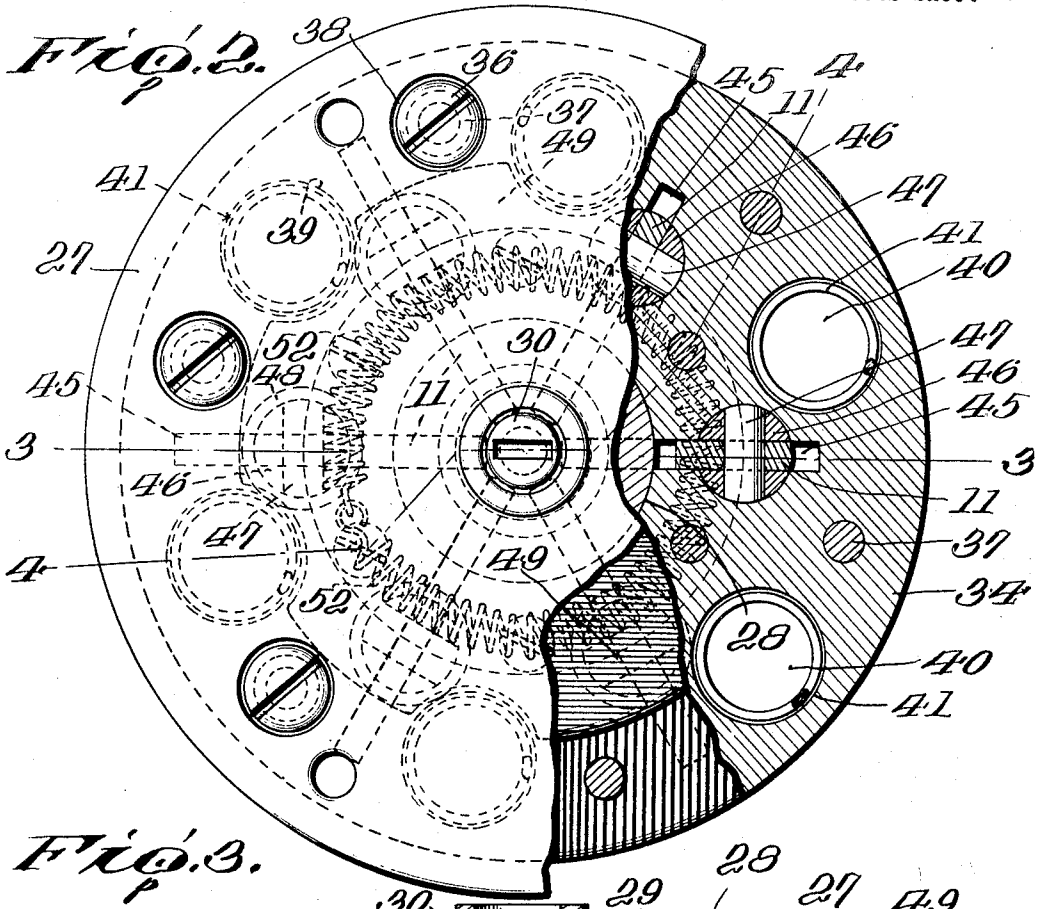
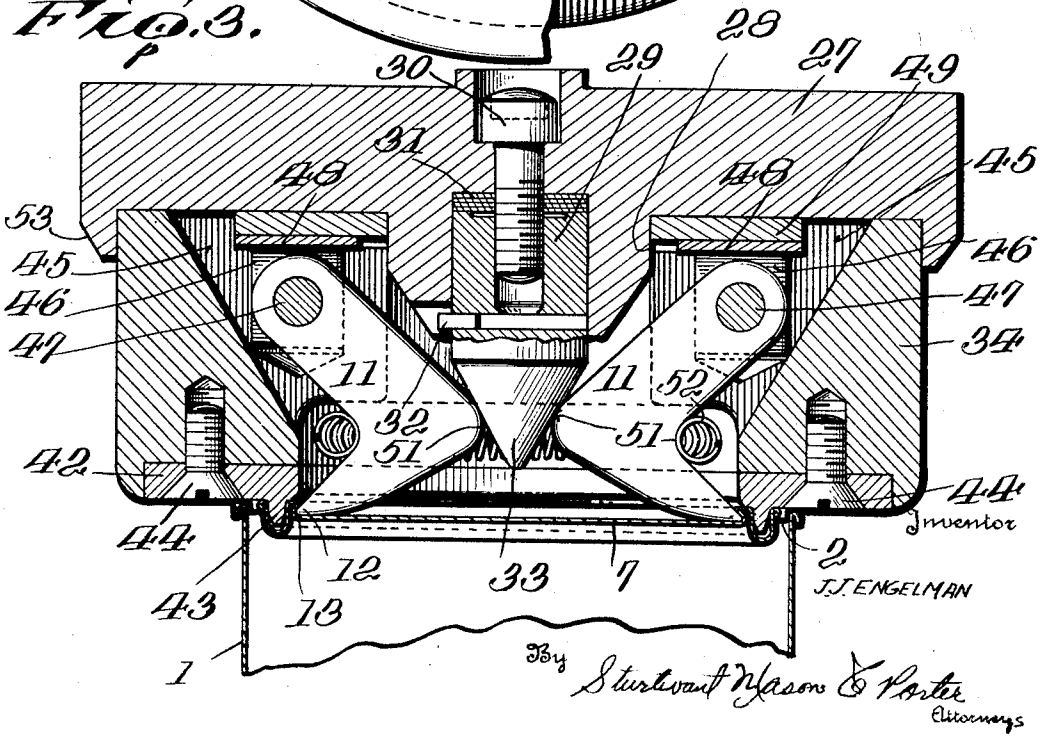


Fig. 3.



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FIG. 4.

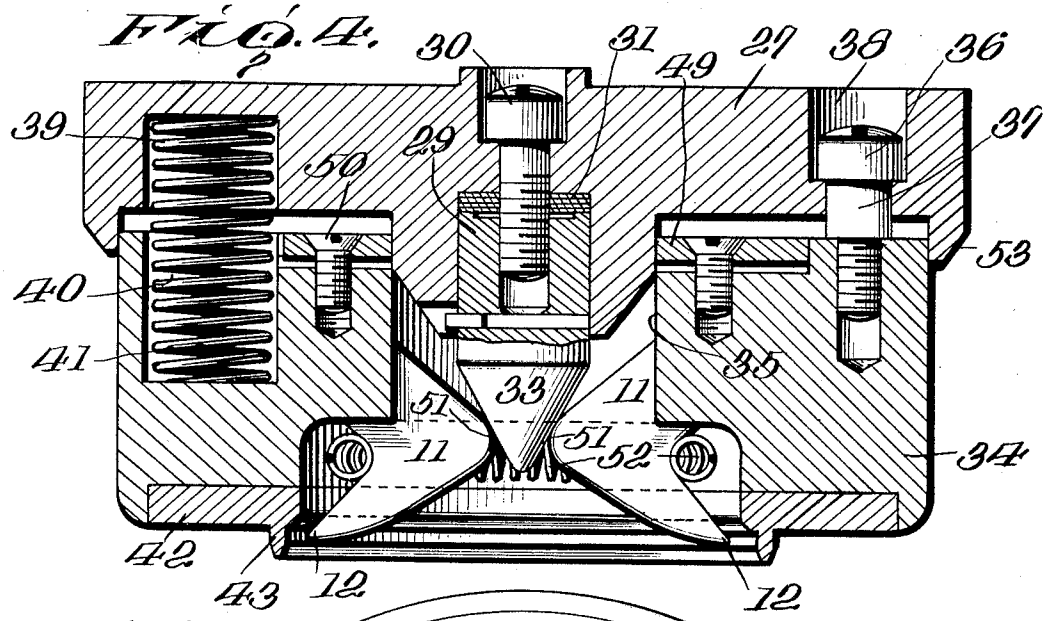
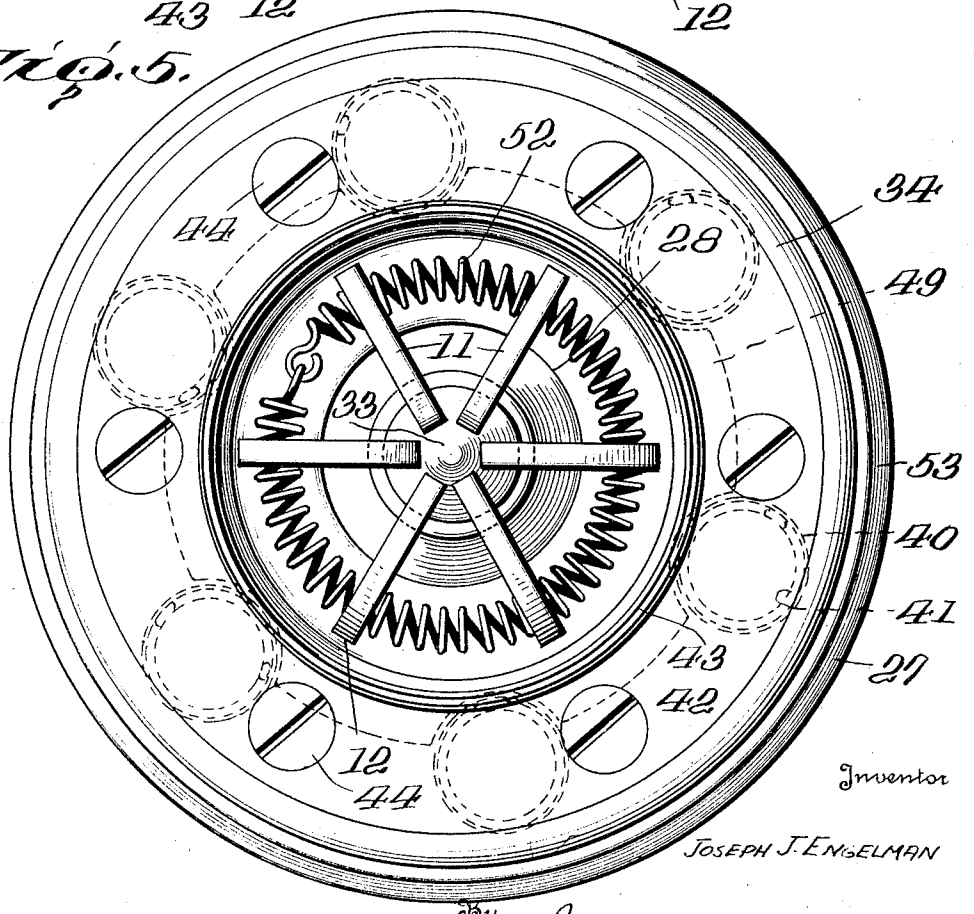


FIG. 5.



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FIG. 6.

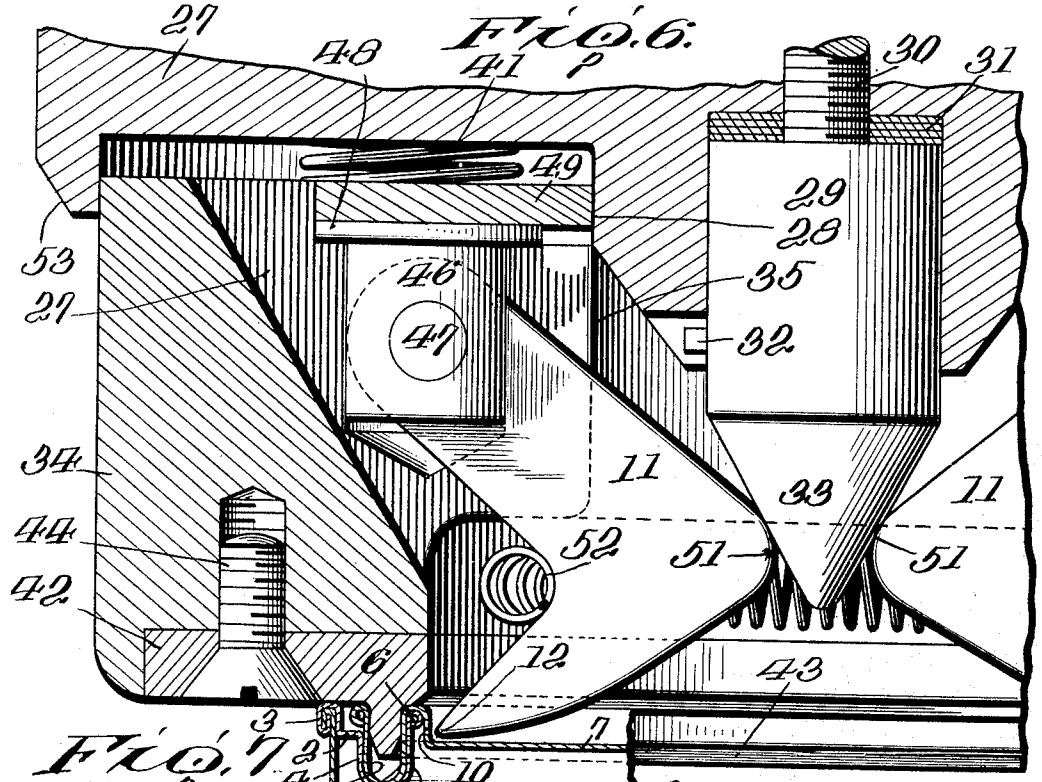
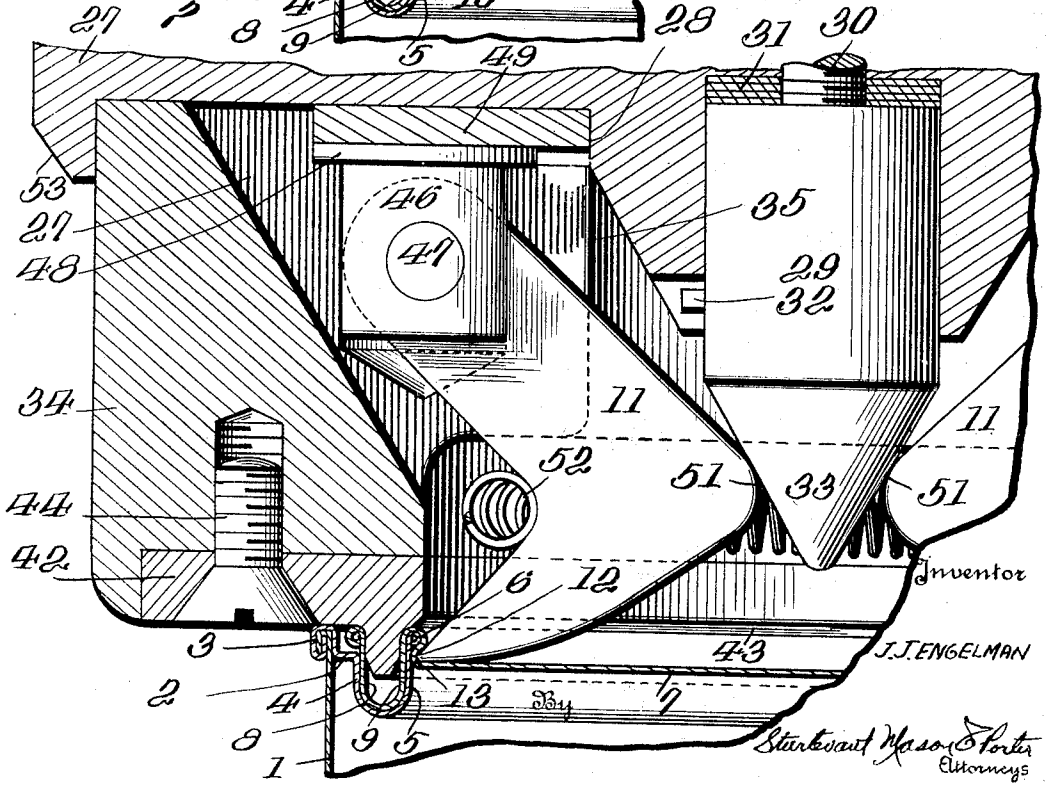


FIG. 7.



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UNITED STATES PATENT OFFICE

1,940,667

MACHINE FOR CLINCHING FRICTION COVERS TO CANS

Joseph John Engelman, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N. Y., a corporation of New York

Application February 20, 1931
Serial No. 517,356

3 Claims. (Cl. 113—18)

The invention relates to new and useful improvements in a machine for clinching a friction cover to a can.

An object of the invention is to provide a machine which may be utilized for forming in the cover, clinching detents which interlock with the friction wall on the can top for retaining the frictionally seated cover on the can.

A further object of the invention is to provide a clinching mechanism of the above type wherein the clinching tools are caused to perform their operation by a vertical movement of the clinching head into engagement with the can top.

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 view in side elevation showing a machine embodying the improvements;

Fig. 2 is a plan view of the clincher head removed from the reciprocating spindle therefor;

Fig. 3 is a sectional view on the line 3—3 of Fig. 2, with the head in contact with the can top;

Fig. 4 is a sectional view on the line 4—4 of Fig. 2, with the head removed from contact with the can top;

Fig. 5 is a bottom plan view of the clincher head;

Fig. 6 is an enlarged sectional view through a portion of the clincher head and the can top when the head first makes contact with the can top, and

Fig. 7 is a view similar to Fig. 6, but showing the continued downward movement of the head and the operation of the clinching tools for indenting the cover to lock the same to the can top.

The invention has to do with a machine for forming a cover with detents which are so located relative to the friction wall as to cooperate therewith in locking the friction cover on its seat on the can top. The invention is shown as applied to a machine which is used for locking a friction cover to a can top of the tripletite character. In Figs. 6 and 7, a can of this type is shown which includes a body portion 1 to which a can top 2 is secured by a double seam 3. The can top is provided with a depression forming an outer friction wall 4, an intermediate friction wall 5, and a rolled portion at the upper edge of the intermediate friction wall 5, which provides a third or inner friction wall 6 on the can top. The cover is indicated at 7. The cover has an annular depression which forms an outer friction wall 8 adapted to cooperate with the friction wall 4, and an intermediate friction wall 9 adapted to cooperate with the friction wall 5. The cover also has a depression forming a wall 10 which extends down inside of the friction wall 6 and makes frictional engagement therewith. The purpose of the present invention is to provide this wall 10 of the cover with detents which project outwardly underneath the friction wall 6 on the can top for thus positively locking the cover to the can, so that during shipment there is no liability of the cover being separated from the can. This is accomplished by a clinching tool 11 having a relatively sharp nose 12 which is forced against the wall 10 and forms indentations therein, one of which is indicated in Fig. 7 at 13. There are a series of these clinching tools which form a series of spaced indentations.

The invention is directed to the means for operating these clinching tools for forming the indentations referred to. The machine as shown diagrammatically in Fig. 1, consists of a portable supporting stand 14 provided with a standard 15 which is threaded so that it can be raised and lowered by means of a control nut 16. Attached to the upper end of the standard 15 is the frame 17 of the machine. Attached to this frame is a work supporting bracket 18 carrying a table 19 on which the can is placed for the operation of the clinching head. The can is indicated at C in the drawings. The table is provided with a curved gauge plate 20 for centering the can on the table beneath the clinching head. The clinching head is indicated as a whole at 21. It is carried by a reciprocating spindle 22. Said spindle is provided with a rack 23 with which a pinion engages for raising and lowering the clinching head. A motor M is provided for operating the spindle. Control clutch member 24 may be provided for shifting the point of connection between the spindle 22 and the sleeve member 22*a* which reciprocates the spindle. This sleeve member 22*a* is provided with a cross head 22*b* with which a roller 22*c* cooperates. This roller 22*c* is carried by a crank eccentrically mounted on the end of a shaft 22*d*. The shaft is connected to a driving gear wheel 22*e* that meshes with a gear wheel 22*f* on a counter-shaft carrying a gear wheel 22*g*, and this gear wheel meshes with a gear wheel on the shaft of the motor M. As the shaft 22*d* is rotated the crank wheel causes the cross head 22*b* to be raised and lowered, and this will raise and lower the spindle.

At the lower end of the spindle 22 is a supporting plate 25 to which the clinching head is attached by suitable bolts 26, 26. The detached

clinching head is shown in Figs. 2 to 7, inclusive. Said clinching head includes a main supporting plate 27 into which the bolts 26 are threaded. Said main supporting plate is provided with a central sleeve member 28 which projects downwardly from the lower face of the plate. Located within this sleeve member is an operating cam 29 which engages and forces the clinching tools against the metal for indenting the same. This operating cam is secured to the plate 27 by means of a bolt 30. Shims 31 may be placed at the bottom of the sleeve pocket in which the cam is mounted for regulating the position of the cam. A key 32 carried by the cam member engages a slot in the plate 27 and prevents any turning movement of this control cam. The lower end of the control cam is cone-shaped as indicated at 33.

The clinching head includes a movable plate member 34. This plate member 34 has a central recess 35 therethrough which is shaped so as to fit over the depending sleeve portion 28. The plate member 34 is attached to the supporting plate 27 by bolts 36. Each bolt has a threaded portion and a sleeve portion 37 and an enlarged head at the upper end of the sleeve portion 37. The sleeve is of sufficient length so as to permit a slight relative movement between the plate member 34 and the supporting plate 27. The head of the bolt limits the downward movement of the plate member 34 relative to the supporting plate 27. In other words, when the supporting plate 27 is raised by the upward movement of the spindle 22, the heads of the bolts will contact with the bottoms of the recesses 38 in which they are located, and the plate member 34 will then be lifted with the supporting plate 27. The supporting plate 27 is provided with a series of recesses 39. The plate member 34 is likewise provided with a series of recesses 40 which are directly opposed to the recesses 39, and in each pair of recesses is a spring 41. These are compression springs, and they serve to move the plate member 34 away from the supporting plate 27. This movement, as noted above, is limited by the heads of the bolts engaging the bottoms of the recesses in the supporting plate 27. There are a series of supporting bolts 36.

At the lower face of the plate member 34 is a metal plate 42 which is provided with a depending annular rib 43 which is shaped so as to fit within the recess in the cover between the friction walls 4 and 5. This rib extends down into this recess to a point well below the friction wall 6 so that the friction walls 5 and 9 are supported by this annular rib. The metal plate 42 is secured to the plate member 34 by screws 44. This metal plate 42 contacts with the double seam joining the can top to the can body, and the annular rib 43 passes into the recess of the cover and serves as an abutment for supporting the can parts during the clinching operation.

The plate member 34 is provided with a series of radial recesses 45. In each recess is located a clinching tool 11. There is a circular recess which is crossed by these recesses 45, and in each circular recess is a pivot sleeve 46 carrying a pivot pin 47 on which the clinching tool 11 is supported. The pivot sleeve 46 is slotted so as to allow the clinching tool to swing freely therein for a limited distance. At the upper end of this sleeve 46 is a flange 48 which overlies the upper face of the supporting member 34. A clamping plate 49 is secured to the upper face of the supporting plate 34 by screws 50. This clamping plate overlies the flanges and firmly holds the pivot sleeves in place.

Each clinching tool is in the form of an elbow member. The portion 51 thereof at the elbow is rounded so as to make contact with the control cam 33. A coiled spring 52 extends around the clinching tools and engages the outer faces thereof, and normally moves the clinching tools inwardly so that they contact with the control cam. When the parts are in the position shown in Fig. 6, the supporting member 34 is in its lowered position, and the clinching tools are drawn inwardly to their extreme limit. This is the position of the parts of the clinching head when the head first makes contact with the can top. After the supporting member 34 makes contact with the can top, it cannot move downward any farther, and then the supporting plate 27 will move downward, compressing the springs 41. This downward movement of the supporting plate 27 relative to the plate member 34, causes the cam 33 to force the clinching tools outward, swinging them on their pivotal supports. The clinching nose of each tool, when the clinching head first makes contact with the can top, is slightly above the lower wall of the depression in the can top, and slightly retracted from the friction wall 10 in the can top. When the supporting plate moves downward, these clinching tools will be carried downward slightly, and forced outward by the cam 33 which causes the noses of the clinching tools to engage the wall 10 and form indentations therein. These indentations project outwardly underneath the friction wall 6 on the can top, and thereby the cover is locked to the can top so that it cannot be dislodged during handling. The cover, however, may be forcibly pried off, and the indentations pulled by the friction wall 6. In order to accomplish this removal of the cover, however, a greater lifting pressure is necessary than can possibly develop during the handling of the can and during shipment, through the contents of the can being thrown against the friction cover. When the spindle moves upward, the plate 27 will move upward therewith, and this will carry the clinching tools upward and outward as the cam 33 releases the same, and permit the head to be lifted from the can top. The purpose of the metal rib 43 is to support the walls and prevent collapse thereof when the clinching tools engage the cover wall and indent the same. There is no resulting distortion of the friction wall. They retain their usual form and all that has been effected by the clinching head is the forming of the locking detents which secure the friction cover to the can top.

It will be noted that the supporting plate 27 has a depending skirt 53 which extends down over the supporting member 34 and thus houses the upper end thereof. When it is desired to increase the extent of the indentations, this can be readily accomplished by adjusting the position of the control cam 33. When shims are added, the cam is lowered and the size of the indentations increased. When the shims are removed, then the cam is raised, and the size of the indentations formed may be decreased.

It will be noted from the above that a clinching head has been provided which is operated by a vertical movement of the clinching head into contact with the can top. When the can is placed on the supporting table and moved against the gauge 20, it contacts with the control arm 54 which sets into operation the spindle 22, and when the can is removed, the opera-

tion of the spindle will stop until another can is placed against this control arm 54. The clinching head may, however, be fixed and the support moved toward and from the clinching head and the same result accomplished.

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 machine for clinching a cover having friction walls which form a recess therebetween to a can having a portion double seamed to the body portion to which the cover is to be clinched comprising a can support, a clinching head disposed above said support, means for imparting a relative movement to said support and clinching head, said clinching head including an upper member and a lower member having a relative movement, springs between said members for separating the same, clinching tools carried by said lower member, a cam carried by the upper member and adapted to engage said tools for operating the same when said upper and lower members are moved toward each other, said lower member having means for engaging the can at the double seam and having an annular projecting rib on the lower face thereof adapted to enter a recess between the friction walls in the cover, said rib operating as an abutment for supporting the can parts during the clinching operation.

2. A machine for clinching covers to cans comprising a can support, a clinching head disposed above said support, said support and said head being movable relative to each other, said clinching head including an upper member and a lower member having a movement relative to the upper member, springs between said members for normally holding the same separated, said lower member having radial recesses formed therein, elbow-shaped clinching tools pivoted to said member and swinging in said recesses radially of the head, a coiled contracting spring surrounding all of said clinching tools and normally moving said tools inwardly, and a cam located centrally of the upper member and having a cone-shaped lower end adapted to engage the clinching tools at the elbow thereof for moving said tools outwardly when the members are moved toward each other.

3. A machine for clinching covers to cans comprising a can support, a clinching head disposed above said support, said support and said head being movable relative to each other, said clinching head including an upper member and a lower member having a movement relative to the upper member, springs between said members for normally holding the same separated, said lower member having radial recesses formed therein, elbow-shaped clinching tools pivoted to said member and swinging in said recesses radially of the head, a coiled contracting spring surrounding all of said clinching tools and normally moving said tools inwardly, a cam located centrally of the upper member and having a cone-shaped lower end adapted to engage the clinching tools at the elbow thereof for moving said tools outwardly when the members are moved toward each other, and means for shifting the position of said cam for varying the extent of movement imparted to the clinching tools.

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