

**July 12, 1927.**

W. F. BUTLER

**1,635,536**

MACHINE FOR FASTENING KEYS TO CAN COVERS

Original Filed Dec. 13, 1923      7 Sheets-Sheet 1

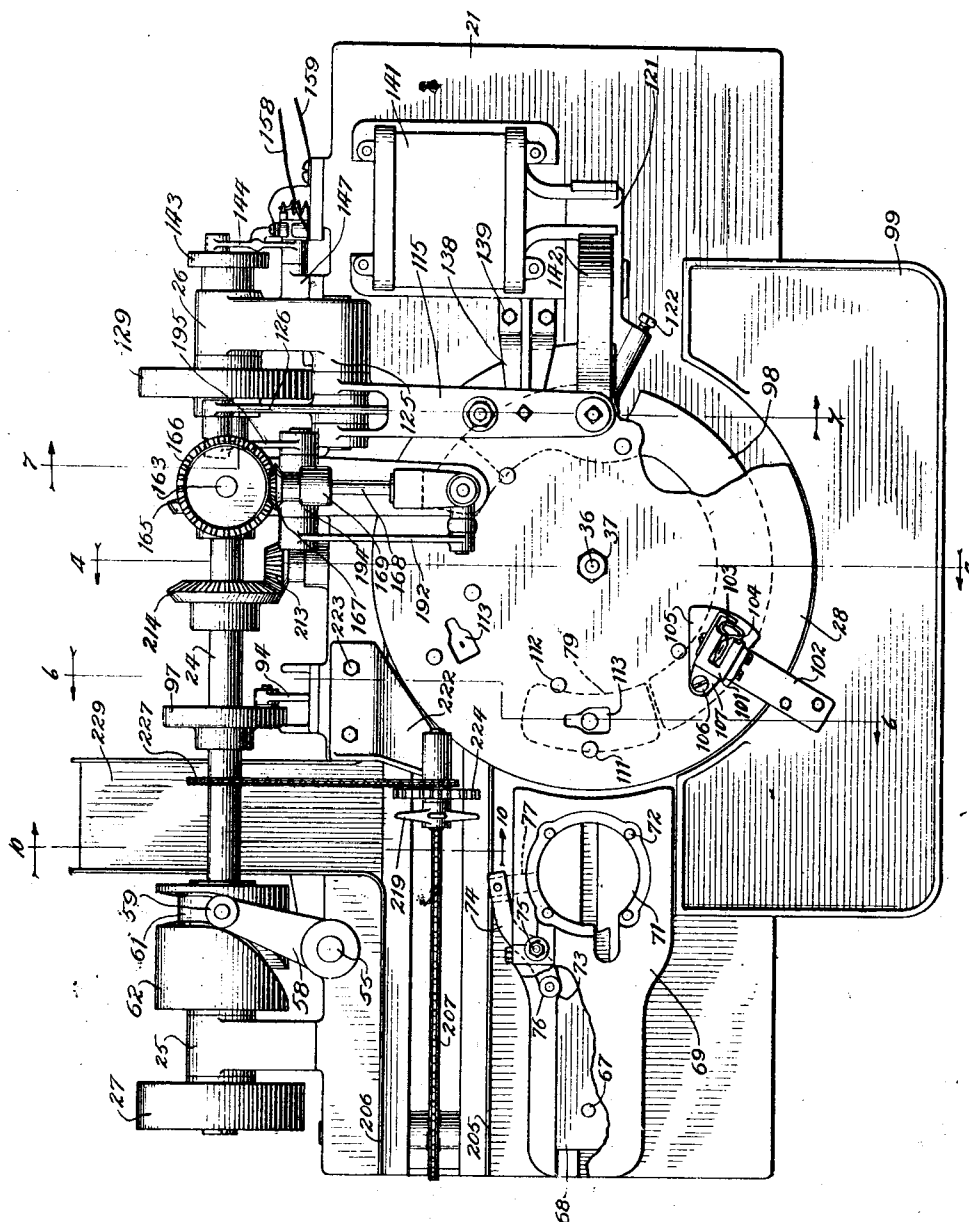


Fig. 1

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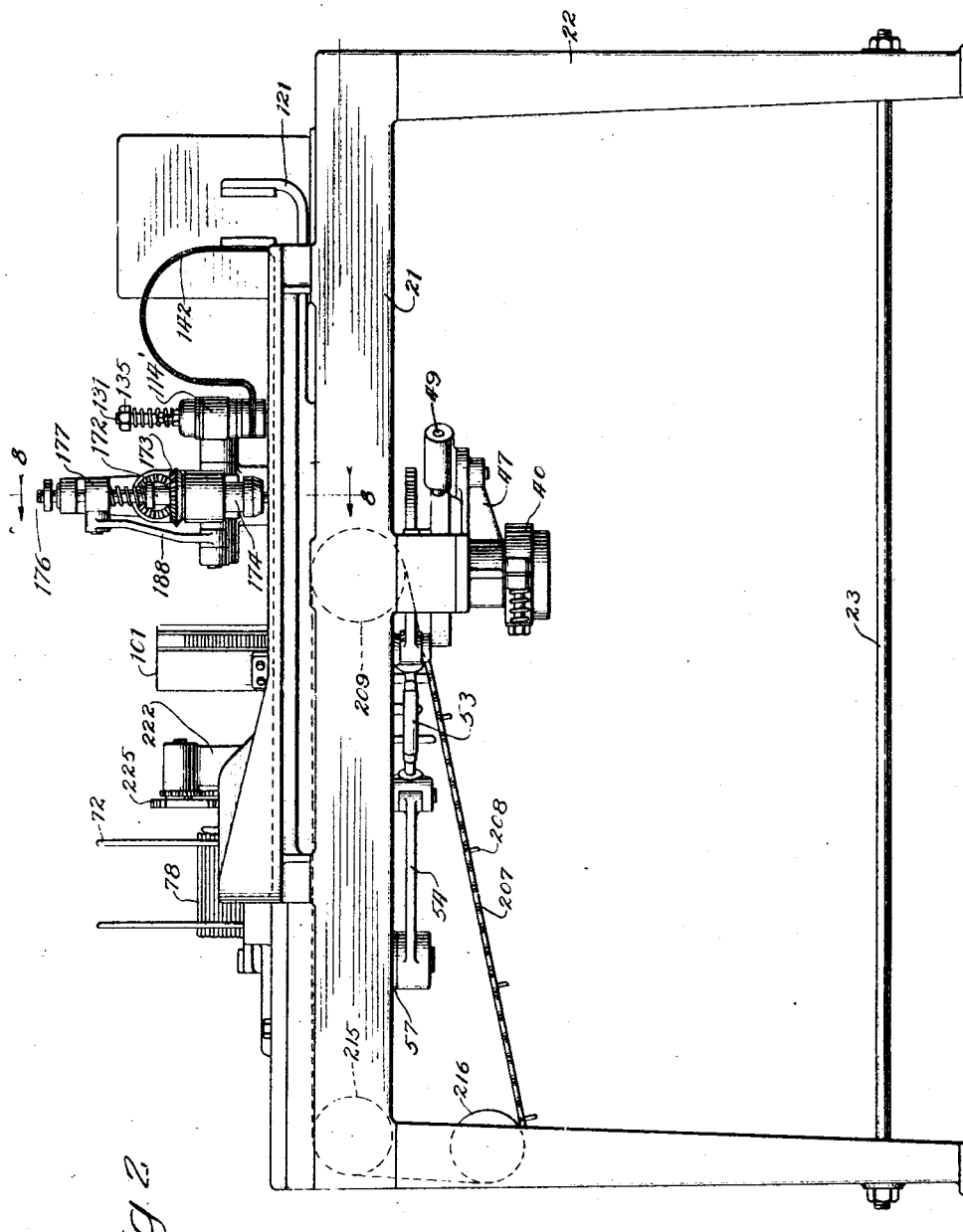


Fig. 2.

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Fig. 4

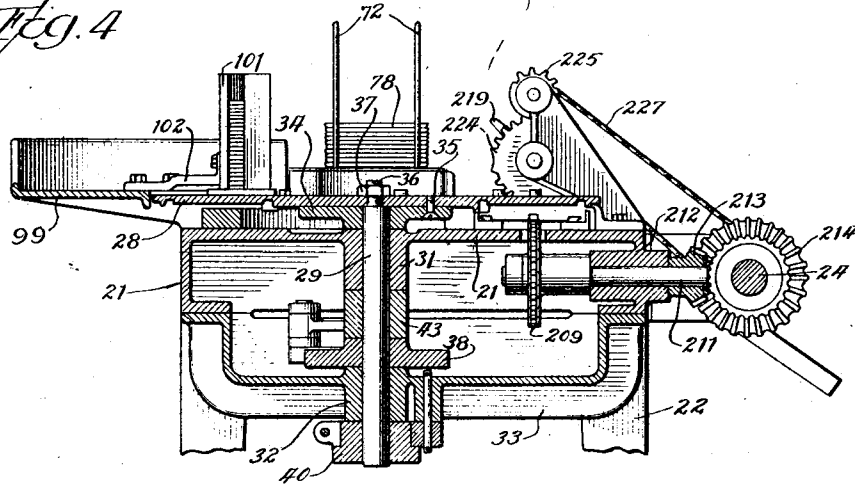


Fig. 3

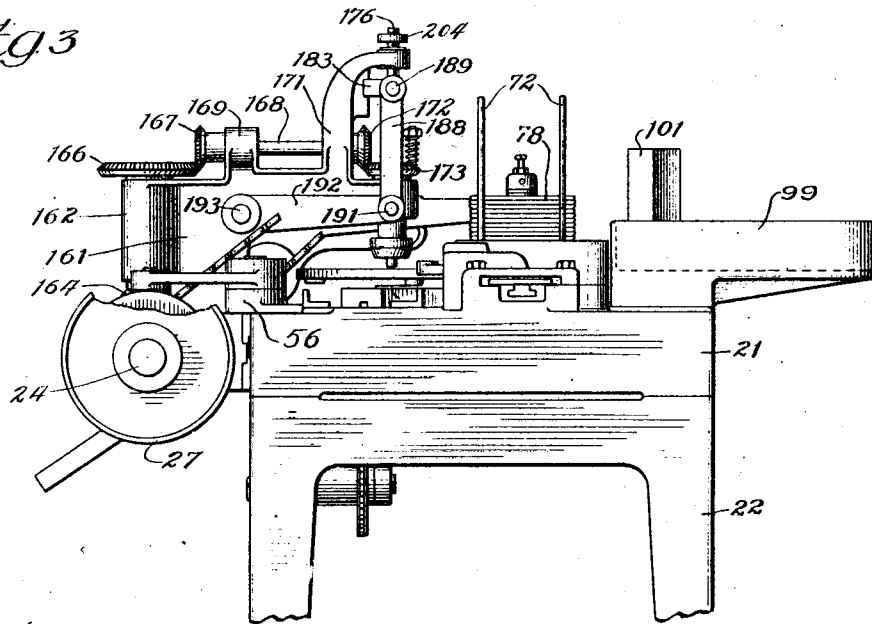
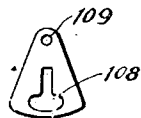


Fig. 5



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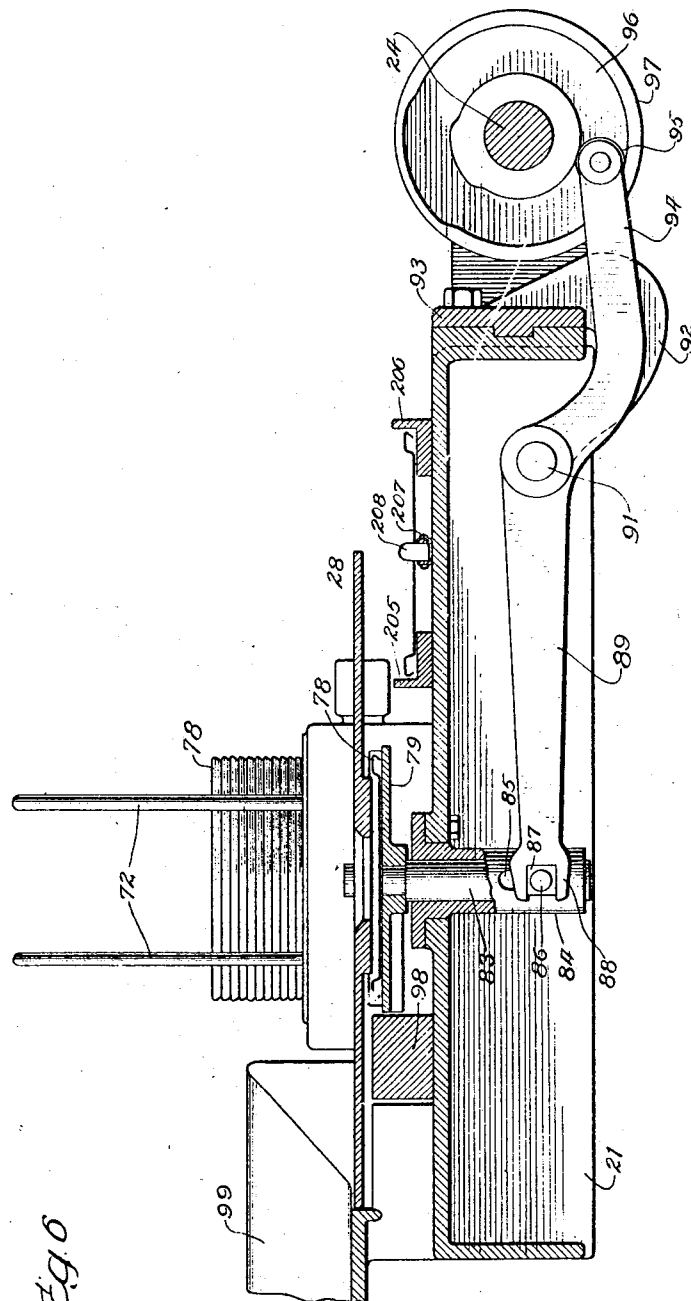


Fig 6

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MACHINE FOR FASTENING KEYS TO CAN COVERS

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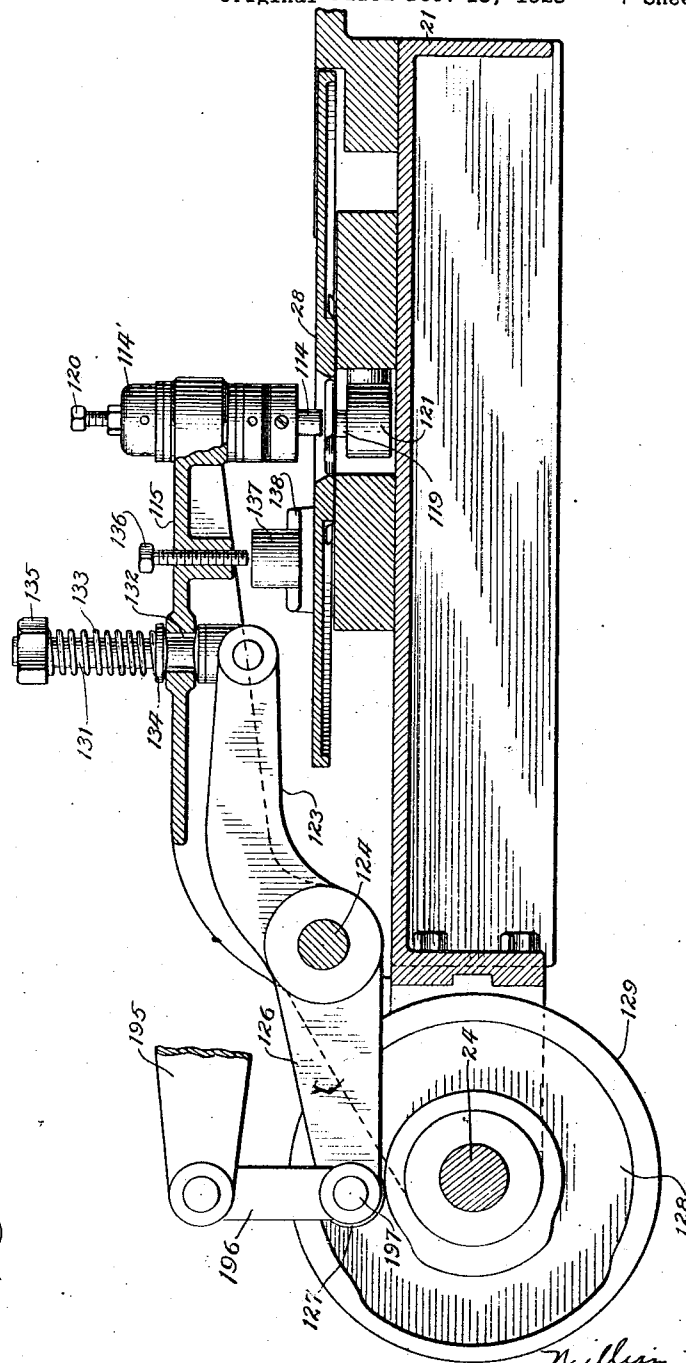


Fig. 7

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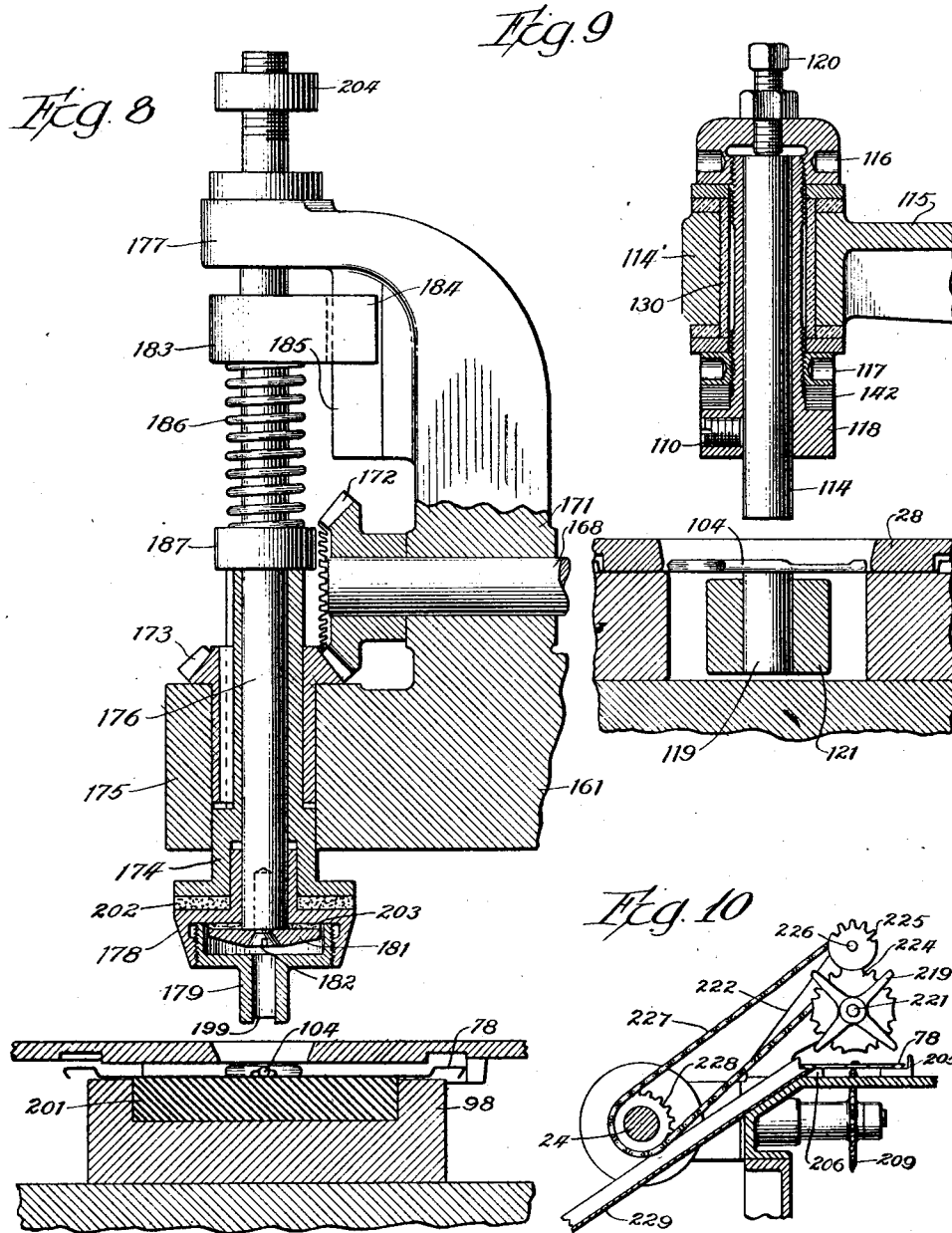
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MACHINE FOR FASTENING KEYS TO CAN COVERS

Original Filed Dec. 13, 1923 7 Sheets-Sheet 6



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MACHINE FOR FASTENING KEYS TO CAN COVERS

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*Fig. 12*

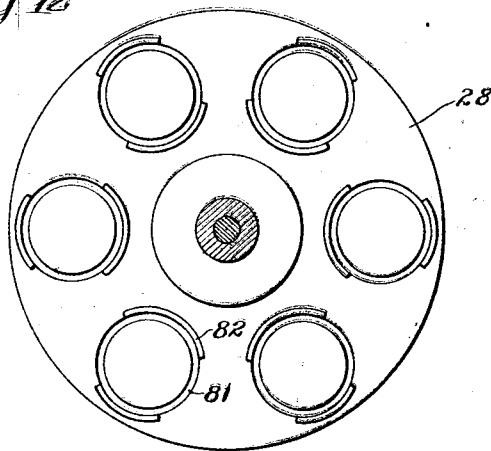


*Fig. 13*

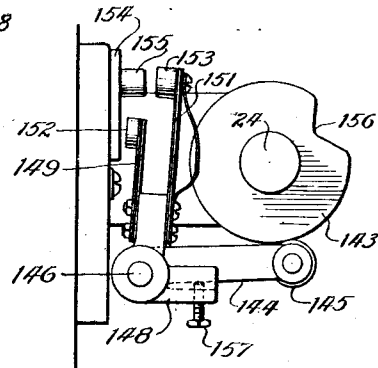
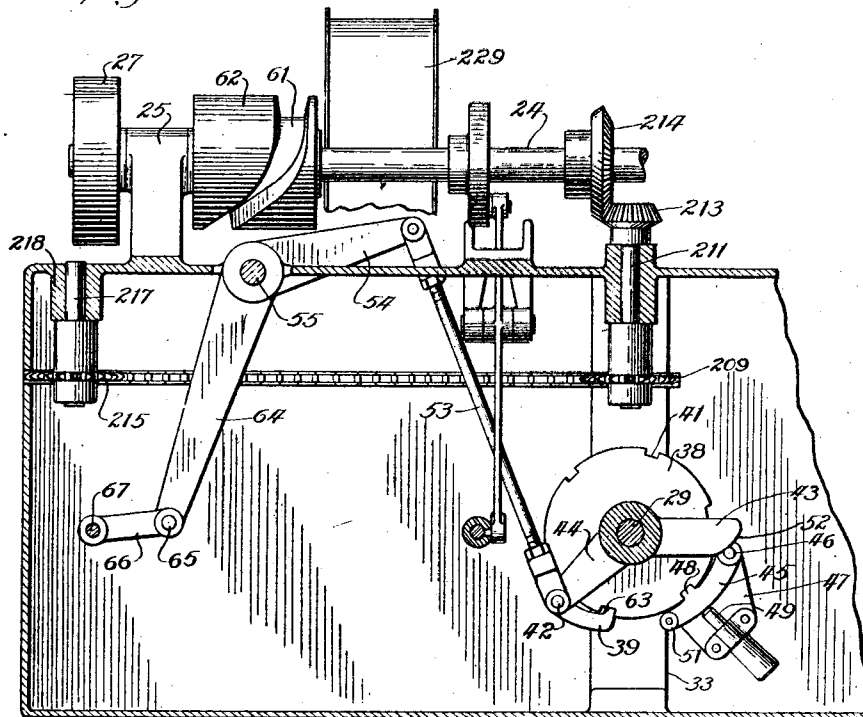


*Fig. 11*



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## UNITED STATES PATENT OFFICE.

WILLIAM F. BUTLER, OF HILLSIDE, NEW JERSEY, ASSIGNOR TO AMERICAN CAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

## MACHINE FOR FASTENING KEYS TO CAN COVERS.

Application filed December 13, 1923, Serial No. 680,379. Renewed November 27, 1925.

My present invention relates to a machine for automatically applying can opening keys to can covers and consists in various combinations and subcombinations of parts of the mechanism cooperating to assemble the keys and covers and to form a bond therebetween which will be of such strength as to withstand shocks received in shipment or rough handling.

The machine includes means for accurately and rapidly assembling covers and keys; welding the keys to the tops of the covers; testing the strength of the weld; and thereafter separating the covers which pass the test from those which do not; and it is the main object of the invention to provide the various instrumentalities by which these operations are performed, the novelty residing in said instrumentalities individually and in various combinations and sub-combinations, as set forth in the appended claims.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings,

Figure 1 is a top plan view of a machine in which my invention is embodied, certain parts being broken away for convenience in illustration;

Fig. 2 is a side elevation of the machine;

Fig. 3 is an end elevation, looking toward the right in Fig. 1, certain parts being omitted for clearness of illustration of certain others;

Fig. 4 is a transverse sectional view, taken substantially along the section line 4—4 in Fig. 1;

Fig. 5 is a detail of the key feeding plate;

Fig. 6 is an enlarged partial section, taken on the broken section line 6—6 in Fig. 1 and illustrating the cover lifting mechanism;

Fig. 7 is a similar view, taken substantially on the broken section line 7—7 in Fig. 1 and showing the welding station;

Fig. 8 is an enlarged vertical section, taken substantially on the section line 8—8 in Fig. 2 and showing the details of the testing mechanism;

Fig. 9 is an enlarged sectional view, taken through the welding head;

Fig. 10 is a view taken substantially on

the line 10—10 in Fig. 1 and showing in detail the cover sorting mechanism;

Fig. 11 is a sectional and plan view, showing the turret rotating mechanism and other elements at the driving end of the machine;

Fig. 12 is a bottom plan view of the turret; and

Fig. 13 is a detail of the automatic contact switch controlling the supply of current to the welding station.

The frame of the machine comprises a table 21, supported upon legs 22 which are connected together by a tie-rod 23, the various operating parts being supported by said table 21.

A drive shaft 24 is journaled in bearings 25 and 26 extending laterally from the table 21 and is driven from any available source of power by means of a belt (not shown) taking over a pulley 27 carried at the end of said shaft 24 adjacent the bearing 25.

A turret 28 is superimposed centrally upon the table 21 and is rigidly mounted upon a turret shaft 29, journaled in a bearing 31 formed integrally with the table 21 and in a bearing 32 formed integrally with a bracket 33 secured to the under side of said table. A disk 34 is secured by screws 35 to the under side of the turret 28 and serves to space said turret a suitable distance above the table 21. Said disk fits upon the shaft 29, which latter has a reduced threaded portion 36 extending through the turret and held to the latter by a nut 37.

Said turret 28 is rotated by mechanism shown particularly in Figs. 1, 4 and 11. A ratchet disk 38 is mounted on the shaft 29 intermediate the bearings 31 and 32 and is adapted to be intermittently rotated by means of a pawl 39 operating in notches 41 about the periphery of said disk. Said pawl 39 is mounted on a stud 42 and is spring-pressed toward the disk 38 by means of a spring (not shown) which may be coiled upon said stud 42. An arm 43 is freely mounted upon the shaft 29, above the ratchet disk 38, and has an extension 44 connected to the stud 42. A locking pawl 45 is pivoted at 46 to an extension 47 of the bracket 33 and is provided with a locking tooth 48 adapted to fit in a notch 41 in which it is normally held by means of a spring-pressed plunger 49 mounted upon said extension 47. Said pawl is provided with a roller 51 at the free

end thereof adapted to be acted upon by the beveled end 52 of the arm 43 to periodically release said disk for rotation.

The stud 42 is connected by a rod 53 with an arm 54 mounted upon a short vertical shaft 55 having bearings 56 and 57 in the table 21. Said shaft carries at its upper end an arm 58 in the end of which is rotatably mounted a roller 59, following a groove 61 in a cam 62 secured to the shaft 24 adjacent the bearing 25. By means of said arm 58 and cam 62, said shaft 55 is given a rocking motion and serves to operate the pawl 39. Upon movement of said pawl in clockwise direction, with reference to the disk 38, it rides out of a notch 41, by reason of the beveled inner edge 63 of said pawl, and engages in the adjacent notch 41. This movement also causes the arm 43 to strike the roller 51 on the locking pawl 45, thereby disengaging the tooth 48 against the tension of the spring acting upon the plunger 49. Upon the reverse motion of the pawl 39, the disk 38 is moved in counter-clockwise direction a sufficient distance to move the turret 28 from one station to another. Upon release of the roller 51 by the arm 43, the locking pawl 45 is again urged inwardly and is caused to engage in the appropriate notch 41 to hold the turret at an operating station. A standard brake 40 is provided at the lower end of the turret shaft 29 to care for any undue looseness of the latter which might tend to prevent accurate registration of the ratchet teeth with said notches 41 and thus interfere with the rotation of the turret 28 from one station to another at proper times.

Secured to the shaft 55 is an arm 64 connected at 65 with a link 66, which is connected at 67 to a slide 68 of the cover feeding mechanism to be now described (see Figs. 1 and 11). Said slide 68 is guided within a cover feed bracket 69, which latter is provided with a cover magazine near the inner end thereof, the covers being adapted to be held in stacked formation in said magazine by a plurality of upwardly extending rods 72. One edge of said slide is provided with a cam recess 73 and a lever 74 is pivoted at 75 to the cover feed bracket 69 and carries at one end a roller 76 bearing against the side of the slide 68 and adapted to be acted upon by the cam recess 73 to operate a knife blade 77 carried at the opposite end of said lever 74 and adapted to successively cut out ends for delivery to the turret 28.

When the slide 68 is in the position shown in Fig. 1, with the roller 76 in the recess 73, the knife blade 77 is withdrawn, permitting the stack of covers 78 to rest upon the bottom of the magazine. Forward reciprocation of the slide causes said knife blade to be inserted between the lowermost

end and the one next above it, separating the stack from said lowermost end, which then may be advanced by the action of the slide, which positions it upon a lift 79, shown clearly in Fig. 6.

A plurality of pockets are formed on the under side of the turret 28 and consist of circular grooves 81 and segmental retaining lugs 82 disposed at the edges of said grooves. For the purpose of positioning the covers in the turret pockets after they have been deposited upon the lift 79, I provide mechanism shown particularly in Fig. 6. This comprises a typically reciprocable rod 83, mounted in a sleeve 84 extending downwardly through the table 21 and having in the wall thereof a slot 85 through which extends a stud 86, projecting from the rod 83 and having freely mounted thereon a bearing block 87 engaged by the bifurcated end 88 of a lever 89 pivoted at 91 to an arm 92 of a bracket 93 secured to the side of the table 21. Said lever 89 is provided with an extension 94 carrying a roller 95 adapted to follow a cam groove 96 in a cam 97 mounted on the shaft 24. A circular track 98 is positioned upon the table 21 beneath the turret 28 and is adapted to support the covers after they are removed from the lift 79 by rotation of said turret.

The next station beyond the cover lifting station just described is the assembling station, at which the keys are placed upon the covers in proper position for welding and the mechanism at this station will now be described, attention being called particularly to Figs. 1, 4 and 5. A work tray 99 is secured to the top of the table at one side and is adapted to hold a supply of keys and covers prior to their being positioned in their respective magazines for feeding. The cover magazine has already been described and the key magazine comprises a U-shaped receptacle 101 secured to a bracket 102 extending inwardly from the tray 99, a guard 103 being secured to one side of said receptacle and adapted to engage the heads of the keys 104 to prevent lateral displacement thereof. A feed plate 105 is pivoted at 106 to a projection upon said receptacle 101. Said plate is shown in detail in Fig. 5, from which it will appear that an aperture 108 of the shape of the keys is provided therein and an aperture 109 is formed in the small end of the plate to receive the pivot 106. Upon the top of the turret 28, I provide spaced studs 111 and 112 adapted to contact with the opposite sides of the plate 105 to turn the latter upon its pivot in feeding the keys, as will now be described. Above each pocket in the turret there is formed an aperture 113 of such form and size as to permit the passage of a key therethrough. As a turret pocket is approaching the assembling

bling station, the stud 111 strikes the outside of the plate 105, moving the latter inwardly so that the aperture 108 therein registers with the aperture 113 in the turret.

5 A key having been positioned in the aperture 108 when the latter was in registration with the bottom of the receptacle 101, it is automatically deposited upon the top of the cover when said apertures 108 and 113 are brought into registration. Further movement of the turret causes the stud 112 to engage the inner side of the plate 105, restoring it to position for another key to be positioned in said aperture 108.

15 Upon the next rotation of the turret, the assembled cover and key are brought to an idle station and upon further rotation to a welding station, the mechanism of which is perhaps best shown in Figs. 1, 2, 7, and 9.

20 An upper electrode 114 is secured by means of a set screw 110 and an adjusting screw 120 in a sleeve 118 mounted in a head 114' in the end of an arm 115. Said sleeve is held in place by lock nuts 116 and 117 and is suitably insulated from the head 114', as indicated at 130. A lower electrode 119 is positioned beneath the turret, being secured in a bracket 121 by means of a locking screw 122.

30 Said lower electrode is adapted to contact with the bottom of the cover and the upper electrode is adapted to be periodically lowered to contact with the key positioned upon the top of said cover to cause a flow of high voltage electricity through said cover and key to weld them together. The arm 115 is reciprocated by means of a lever 123 pivoted at 124 to a projection 125 of the bearing 26 and having an extension 126 carrying at its end a cam following roller

40 127 disposed in a cam groove 128 of a cam 129 mounted on the drive shaft 24. The lever 115 is of channel construction and is pivoted upon the pivot 124 of the lever 123, which latter has its forward end disposed in the channel on the under side of said lever 115. Oscillation of the lever 123, accomplished by the rotation of the cam 129, raises and lowers the lever 115 and it will be observed that I have provided a loose connection between said levers by means of a stud 131 extending upwardly from the end of the lever 123 and through an aperture 132 in the top of the lever 115, said stud having a spring 133 mounted thereon between a loose collar 134 and a nut 135. For the purpose of limiting downward movement of the electrode 114, I provide an adjusting screw 136 extending through the lever 115 near its outer end and adapted to contact with a projection 137 on a stop bracket 138 secured to the frame by means of screws 139. The spring connection between the levers 123 and 115 serves to take up any overthrow of the cam 129 after the adjusting screw 136 contacts with the stop bracket. The current is

supplied to the electrodes 114 and 119 through a "step up" transformer 141, which produces a high voltage for welding purposes. From said transformer, the current passes to the electrodes by means of copper connections 142 and 121, the latter being in the form of a bracket and having been hereinbefore referred to as the means for holding the electrode 119 in fixed position beneath the path of the covers. The current is not supplied to said electrodes continuously but intermittently by means of an automatic switch, illustrated particularly in Figs. 1 and 13. A cam 143 is mounted on the end of a drive shaft 24 and is adapted to actuate a lever 144, carrying at its end a cam following roller 145 and being pivoted at 146 to an extension 147 of the bearing 26. Said roller is held in contact with the cam by means of a coil spring (not shown) upon the pivot 146. A bell crank 148, secured to the pivot 146, has current conducting extensions 149 and 151, carrying contact points 152 and 153 adapted to be periodically moved into contact respectively with a plate 154 and a contact point 155. The plate 154 is attached to and insulated from the frame and the contacts just referred to are established when the roller 145 is permitted to enter a cut-out 156 in said cam 143. A set screw 157 in the lower extension of the bell crank 148 is employed to control the amount of divergence between the lever 144 and the upper extension of said bell crank, thereby adjusting the contact points. The plate 154 and contact points 152 and 153 are included in an electric circuit by means of wires 158 and 159 and the contact points 152 and 153 are connected with the transformer 141 in any desired manner. It will be obvious that by the mechanism just described, high voltage current is intermittently fed to the electrodes 114 and 119 to accomplish the welding action.

After the keys have thus been welded to the covers, the strength of the bond is tested by mechanism perhaps best shown in Figs. 1, 3 and 8, this operation being performed at the station next beyond the welding station in the rotation of the turret. A bracket 161 (see Fig. 3) is mounted at the side of the table and provides a bearing 162 for a short vertical shaft 163, carrying at its lower end a gear 164 meshing with a gear 165 on the shaft 24, said shaft 163 having mounted thereon, at its upper end, a gear 166 meshing with a beveled pinion 167 on the outer end of a horizontal shaft 168 having bearings 169 and 171 projected upwardly from the bracket 161. At the inner end of said shaft 168 is another beveled pinion 172, meshing with a gear 173 keyed to a spindle sleeve 174 mounted in a projection 175 upon the bracket 161. Mounted within said sleeve is a spindle 176, which extends upwardly through an overhanging extension 177 of the

130

bearing 171 formed integrally with the bracket 161. A short sleeve 178 is mounted upon the lower end of the spindle 176 and a key-engaging member 179 is threaded into said sleeve, as shown in Fig. 8. A retaining washer 181 is secured to the lower end of the spindle 176 by means of a screw 182 and serves to hold the parts in assembled relationship. A collar 183 is pinned to the spindle 176 and is held against rotation by means of projections 184 slidable upon a fixed guide 185 formed integrally with the bracket extension 177. A spring 186 is mounted upon the spindle between said collar 183 and a loose collar 187 positioned above the sleeve 174 and tends to yieldingly hold the latter in operative position, as will hereinafter appear.

The spindle 176 is adapted to be vertically reciprocated to periodically move the key-engaging member 179 into engagement with a key, this being accomplished by means of a link 188, connected at 189 to the collar 183 and at 191 to a lever 192 secured to a shaft 193 mounted in a projecting bearing 194 integral with the bracket 161. The shaft 193 is adapted to be rocked by means of a lever 195 connected by a link 196 (Fig. 7) to a stud 197 by which the roller 127 is secured to the lever extension 126. The spindle 176 is thus actuated by the cam 129, which also operates the welding head (see Fig. 7).

Upon downward reciprocation of said spindle 176, a key 104 on a cover 78 is engaged in a slot 199 in the member 179, which member bears against the top of the cover, holding it tightly against a rubber pad 201 inset in the track 98, which at this point is slightly below the level of the preceding portions thereof. The sleeve 174 is continuously rotated, as hereinbefore described, and tends to rotate the short sleeve 178 through the medium of a friction disk 202 interposed between said sleeves. If the key be secured tightly enough to overcome the friction of said disk, the sleeve 178 and key-engaging member 179 remain stationary and slippage occurs between said sleeves 174 and 178. If, however, the key be insufficiently secured, the friction of the disk 202 will not be overcome and the rotation of the key-engaging member 179, with the sleeve 178 in which it is secured and the driven sleeve 174, will dislodge the key. A friction disk 203 is interposed between the retaining washer 181 and the sleeve 178, but is of considerably less area than the disk 202, so that slippage will occur at this point rather than upon said disk 202, unless the key-engaging member 179 and sleeve 178 are restrained from movement by the bond between the key 104 and cover 78. It should be noted, also, that the area of the friction surface of the pad 201 is considerably in excess of that of

the disk 202, so that the cover will be held against rotation during the testing action. A limiting collar 204 is provided on the upper end of the spindle 176 to limit the downward movement thereof.

After the covers pass the testing station, they are deposited between guideways 205 and 206 and are propelled toward the end of a machine shown at the left in Fig. 1 by means of a feed chain 207 having flights 208 thereon in such spaced relationship that one of said flights engages each cover as it is delivered from the turret, due to the synchronized operation of said turret and feed chain. Said chain 207 is driven by means of a sprocket 209, shown clearly in Fig. 4. Said sprocket is mounted upon a short shaft 211, journaled in a bearing 212 integral with the table 21 and carrying at its outer end a beveled pinion 213 meshing with a beveled gear 214 on the shaft 24. At the end of the machine, said chain extends over spaced sprockets 215 and 216 mounted on short idle studs 217, journaled in bearings 218 integral with the frame.

For the purpose of sorting the covers which have passed the weld test from those which have not, I employ a star wheel 219 mounted upon a short shaft 221 having bearings in a bracket 222 secured by means of screws 223 to the top of the table 21 (see Figs. 1, 4 and 10). A Geneva gear 224 is also mounted upon the shaft 221 and is adapted to be driven by a Geneva pinion 225 mounted on a stud 226 also having bearings in the bracket 222. Said stud is driven by means of a chain 227, taking over a sprocket thereon and a sprocket 228 on the shaft 24. The star wheel 219 and the feed chain 207 are synchronized so that a prong on said wheel passes above each cover as it is propelled along the tracks 205 and 206. If a key be present upon the cover, it will be struck by one of said prongs and the cover directed away from said conveyer 207 into an inclined chute 229 projecting laterally from the frame. If, however, no key be present, or it is loose upon the top of the cover, the cover will pass beneath said star wheel and be discharged in a suitable receptacle at the end of the machine.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention, or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A machine for attaching keys to can covers, comprising in combination a turret, means for positioning can covers in pockets

of said turret, means for depositing keys upon the top of said covers at a station in the rotation of the turret, means for welding the keys to the covers, and means for testing  
5 the strength of the weld.

2. A machine for attaching keys to can covers, comprising in combination a turret, means for positioning can covers in pockets of said turret, means for depositing keys  
10 upon the top of said covers at a station in the rotation of the turret, means for welding the keys to the covers, means for testing the strength of the weld, and means for sorting the covers in accordance with the  
15 weld test.

3. A machine for attaching keys to can covers, comprising in combination means for welding opening keys to the covers, and means for automatically testing the strength  
20 of the weld.

4. A machine for attaching keys to can covers, comprising in combination means for welding opening keys to the covers, means for automatically testing the strength  
25 of the weld, and means for automatically sorting the covers in accordance with the weld test.

5. A machine for attaching keys to can covers, comprising in combination means  
30 for automatically assembling the keys and covers, means for securing said keys and covers together, and means for testing the strength of the securing bond.

6. A machine for attaching keys to can covers, comprising in combination means for  
35 automatically assembling the keys and covers, means for securing said keys and covers together, means for testing the strength of the securing bond, and means for sorting the covers which pass the test from those  
40 which do not.

7. A machine for attaching keys to can covers, comprising in combination means  
45 for welding opening keys to the covers, and means for automatically testing the strength of the weld, said last-mentioned means comprising a rotatable key-engaging member mounted to permit slippage of the rotating mechanism when predetermined resistance  
50 is offered by the key to rotation of said engaging member.

8. A machine for attaching keys to can covers, comprising in combination means for  
55 bonding opening keys to the cover, and means for automatically testing the strength of the bond, said last-mentioned means comprising a rotatable key-engaging member mounted to permit slippage of the rotating mechanism when predetermined resistance  
60 is offered by the key to rotation of said engaging member.

9. A machine for attaching keys to can covers, comprising in combination means for welding opening keys to the covers, means

for automatically testing the strength of the  
65 weld, said last-mentioned means comprising a rotatable key-engaging member mounted to permit slippage of the rotating mechanism when predetermined resistance is offered by the key to rotation of said engaging member,  
70 and means for holding the cover against rotation during operation of said testing mechanism.

10. A machine for attaching keys to can covers, comprising in combination means for  
75 welding opening keys to the covers, means for testing the strength of the weld, and means for sorting the covers in accordance with the weld test, said sorting means comprising a rotatable member operable above  
80 the path of the covers beyond the testing station and adapted to strike the keys and deflect the covers from said path if said keys be securely welded thereto.

11. A machine for attaching keys to can  
85 covers, comprising means for forming a securing bond between a key and cover, means for testing the strength of said bond, and means for sorting the covers in accordance with the strength of the bond, said means  
90 comprising a rotatable member operable above the path of the covers beyond the testing station and adapted to strike the keys and deflect the covers from said path if said keys be securely welded thereto.  
95

12. A machine for attaching keys to can covers, comprising a turret having intermittent rotation, means for automatically assembling the keys and covers in pockets of said  
100 turret, spaced electrodes adapted to contact respectively with the keys and covers when they arrive at a welding station, and means for supplying high voltage current to said electrodes, said means including an inter-  
105 mittently operable automatic switch synchronized with the operation of the turret.

13. A machine for attaching keys to can covers, comprising a feed turret, means for  
110 positioning covers in pockets on the under side of said turret, a key magazine above the turret, a pivoted feed plate operable during rotation of the turret to transfer keys from said magazine and deposit them through apertures in the turret onto the tops  
115 of the covers, and means for securing the keys to the covers.

14. A machine for attaching opening keys to can ends, comprising, in combination, elec-  
120 trodes for welding said parts together, and automatic means for feeding the ends to the welding station, and means for placing the keys loosely at a predetermined point on said ends successively.

15. A machine for attaching opening keys to can ends, comprising in combination,  
125 trodes for welding said parts together, means for automatically delivering the keys to the welding station in position for welding to

a positioned end, and mechanism for successively operating the key delivering means and then said electrodes.

16. A machine for attaching opening keys to can ends, comprising in combination, electrodes for welding said parts together, and means for automatically feeding the ends, and keys loosely resting at a predetermined point on said ends, in assembled relationship to the welding station.

17. A machine for attaching opening keys to can ends, comprising in combination, electrodes for welding said parts together, means for automatically feeding the can ends from a stack to the welding station, and means for automatically feeding keys from a stack and placing them in position for welding upon said ends, and means for keeping the key in predetermined position on the can end while said parts are carried to the welding station and the key is positioned in line with the electrode which is to contact with it.

18. A machine for attaching opening keys to can ends, comprising, in combination, electrodes for welding said parts together, and means for automatically feeding the keys to the welding station for attachment to a positioned end, said means including conveyor means and a cut-out device for moving the keys from a stack to position for transfer by said conveyor means to said welding station and means for controlling the position of the key on the can end while it is being carried to said electrodes.

19. A machine for attaching opening keys to can ends, comprising, in combination, electrodes for welding said parts together, feeding means for the ends, and feeding means for the keys, said last mentioned means comprising a cut-out device for moving the keys individually, from a stack and positioning them upon the ends as the latter are moved by said end feeding means to the welding station and an apertured plate for properly locating the keys relative to said electrodes.

20. A machine for attaching opening keys to can ends, comprising, in combination, electrodes for welding said parts together, and feeding means, including a conveyor adapted to receive and transfer both the ends and keys to the welding station, said feeding means operating to superpose the key at a predetermined position on the can end.

21. A machine for attaching opening keys to can ends, comprising, in combination, electrodes for welding said parts together and feeding means, including a conveyor adapted to receive and transfer both the ends and keys to the welding station, means for automatically delivering the ends to said conveyor, and means for automatically delivering the keys thereto including apertures in said conveyor.

22. A machine for attaching opening keys to can ends, comprising, in combina-

tion, electrodes for welding said parts together, and feeding means, including a conveyor adapted to receive and transfer both the ends and keys to the welding station, means for automatically delivering the ends to said conveyor and means for automatically delivering the keys thereto, the ends and keys being arranged in said conveyor in desired relationship for welding.

23. A machine for attaching keys to can ends, having, in combination, a can end support and apertured key positioning member, and opposed electrodes having a relative movement for welding a key part held in said positioning member to a can end supported on said support.

24. A machine for attaching keys to can ends, having, in combination, means for supporting the said parts to be joined, and electrodes for welding the said parts together.

25. The process of attaching opening keys to can ends, which consists in arranging an untinned key upon a tinned can end, and welding a rounded portion of the key to the flat surface of the end.

26. A machine for welding articles in assembled relation, comprising, in combination, a turret, means for positioning articles in pockets of said turret, means for depositing other articles adjacent said first mentioned articles in said turret and at a station in the rotation thereof and in a circular path leading to the welding means, and means for welding said articles together and in predetermined relation at another station in the rotation of the turret.

27. A machine for welding articles in assembled relation, comprising, in combination, a turret, means for positioning articles in pockets of said turret, means for depositing other articles adjacent said first mentioned articles in said turret and at a station in the rotation thereof, means for welding said articles together, and means for testing the strength of the weld.

28. A machine for welding articles in assembled relation, comprising, in combination, a turret, means for positioning articles in pockets of said turret, means for depositing other articles adjacent said first mentioned articles in said turret and at a station in the rotation thereof, means for welding said articles together, means for testing the strength of the weld, and means for sorting pairs of said articles in accordance with the weld test.

29. A machine for welding articles in assembled relation, comprising, in combination, a turret, means for positioning articles in pockets of said turret, means for depositing other articles adjacent said first mentioned articles in said turret and at a station in the rotation thereof, means for welding said articles together, means engaging

said articles for determining the strength of the weld, and means for sorting out sets of said articles not properly welded.

30. An automatic machine for welding  
5 keys to can parts, having in combination a turret having on its under side seats for the can parts and apertures for the keys

above said seats, means for holding the can parts in said seats, mechanism for turning said turret, electrodes adapted to contact 10 with the can parts and keys, and means for causing said contact when said turret is in a predetermined position.

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