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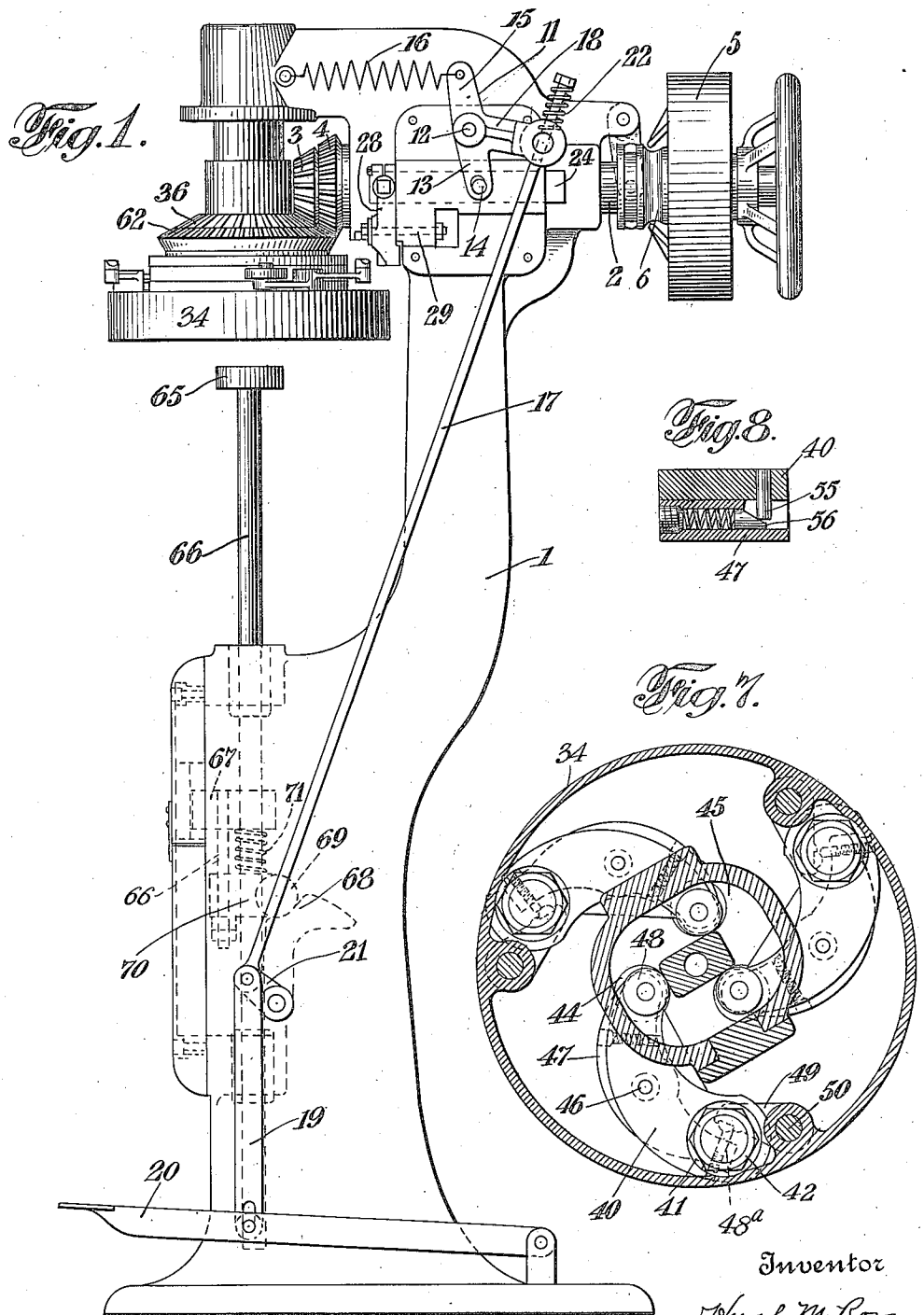
1,469,334

H. M. ROSS

SEAMING MACHINE

Filed Oct. 27, 1921

4 Sheets-Sheet 1



Inventor

Hugh M. Ross

By his Attorneys

Kenyon & Kenyon

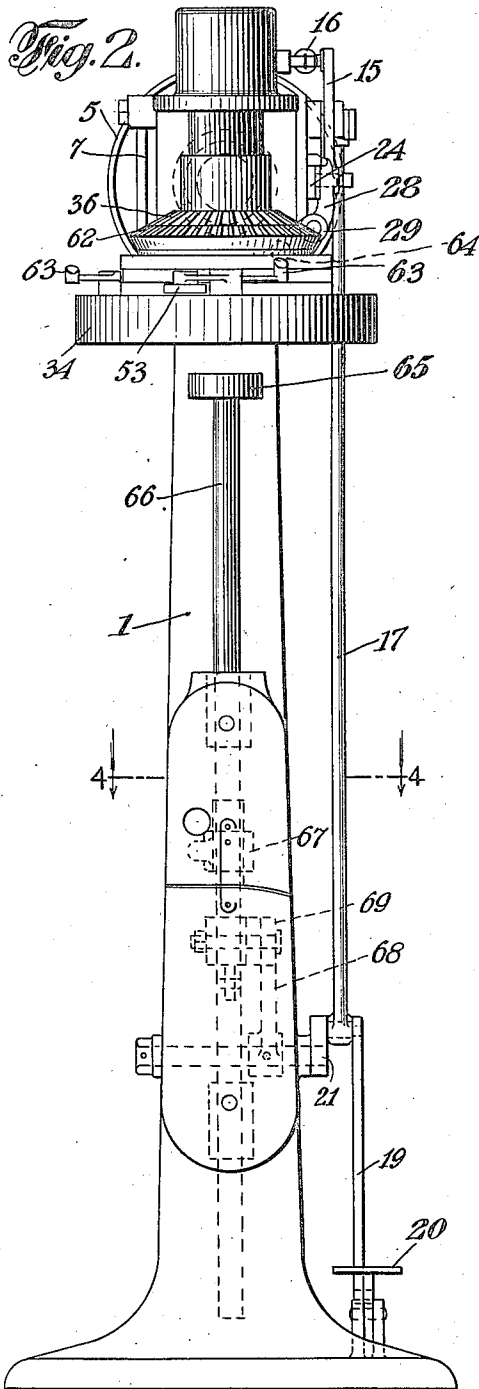
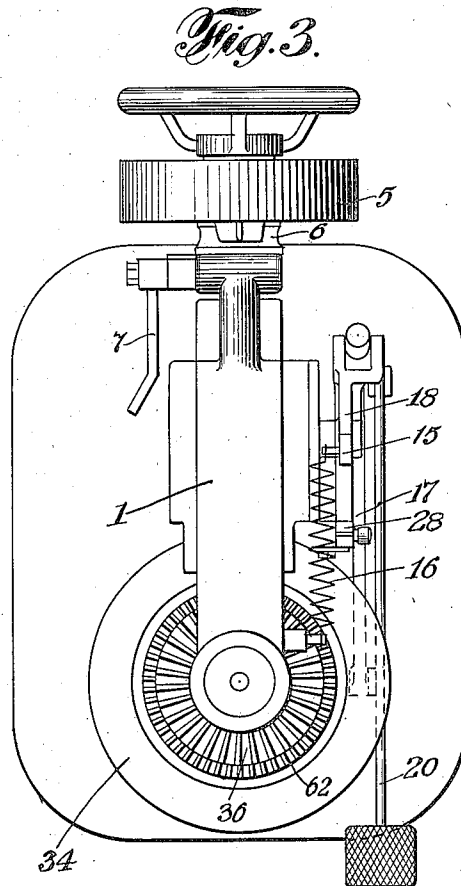
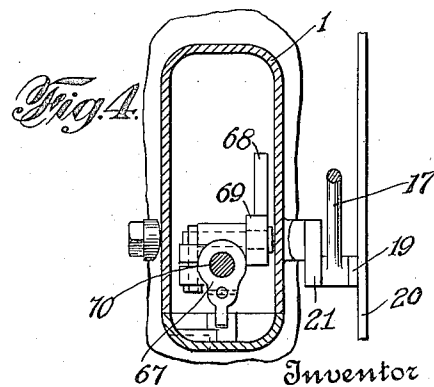
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4 Sheets-Sheet 2



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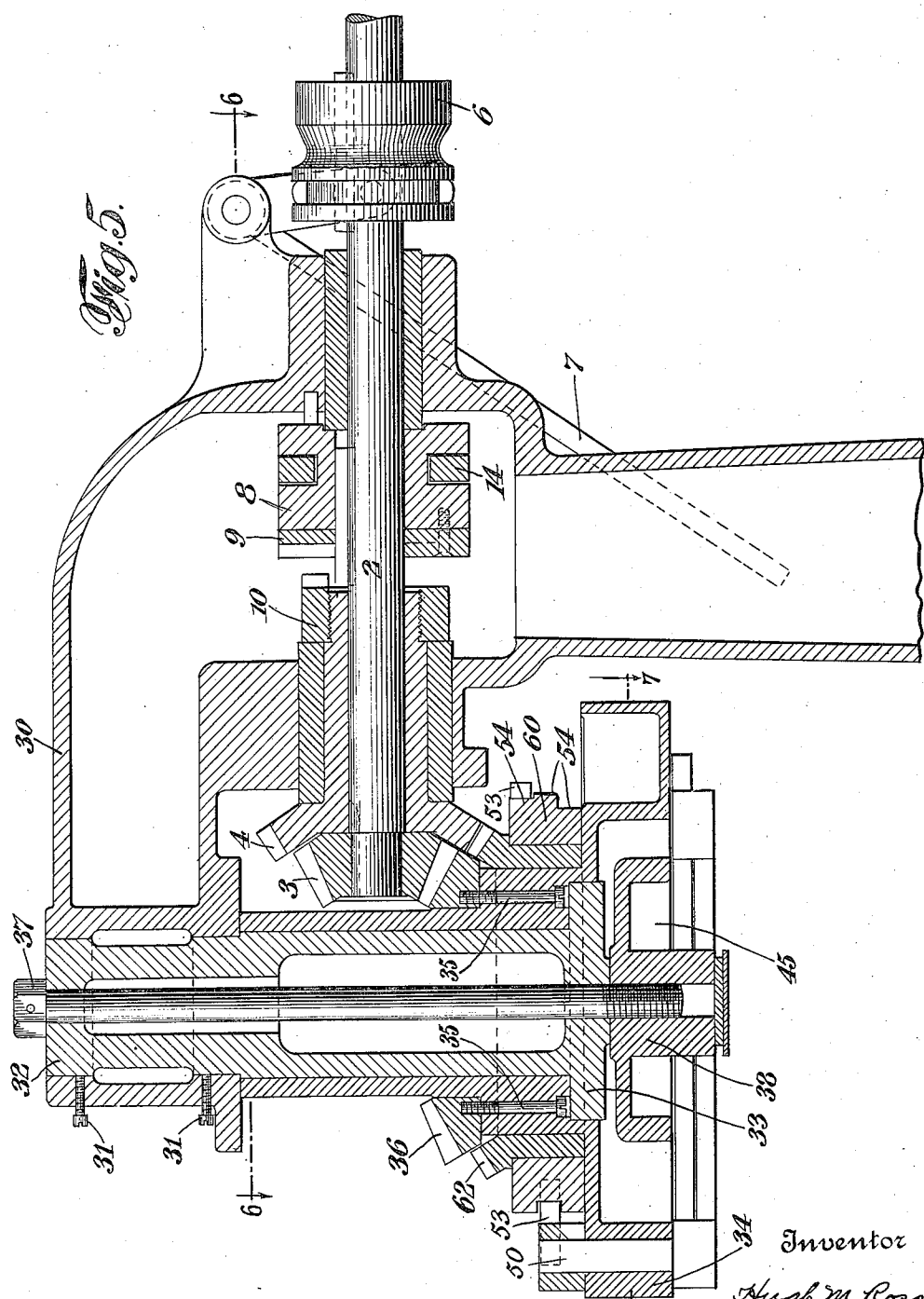
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4 Sheets-Sheet 3



Inventor

Hugh M. Ross

By his Attorneys

Kenyon Kenyon

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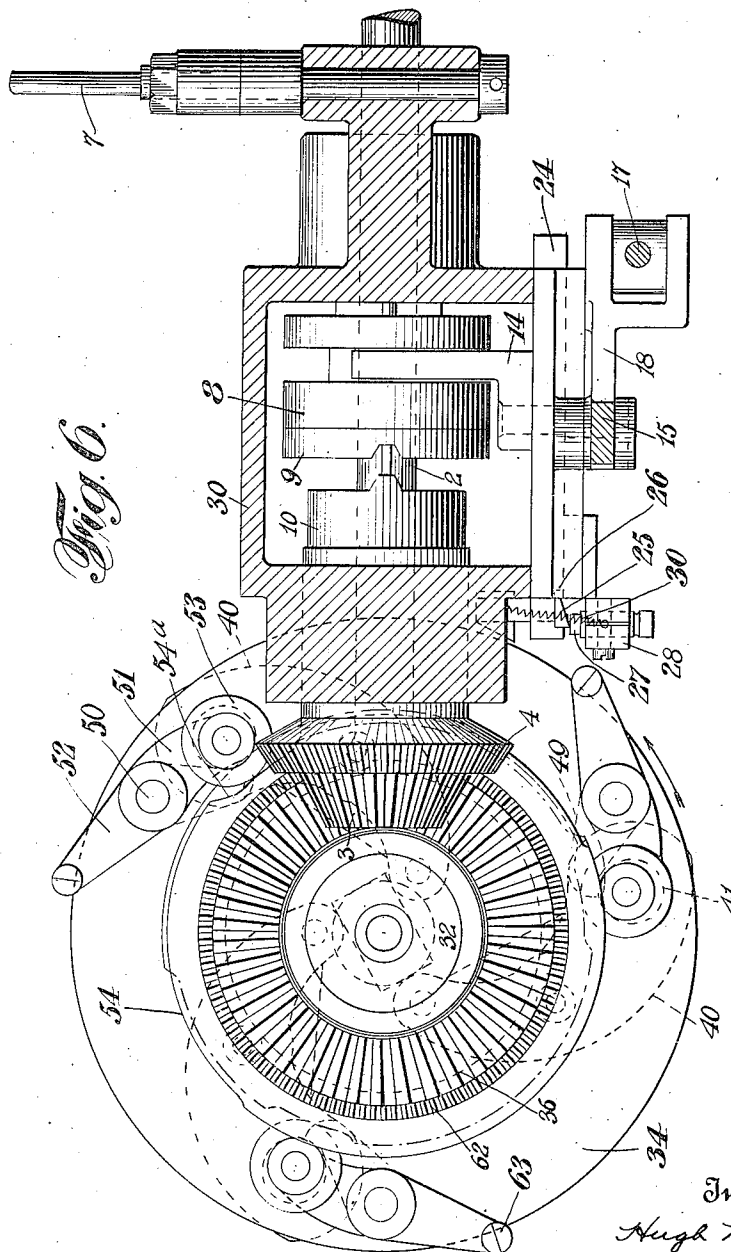
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H. M. ROSS

SEAMING MACHINE

Filed Oct. 27, 1921

4 Sheets-Sheet 4



Inventor
Hugh M. Ross

By his Attorneys

Kenyon Kenyon

UNITED STATES PATENT OFFICE.

HUGH M. ROSS, OF WOODHAVEN, NEW YORK, ASSIGNOR TO ADRIANCE MACHINE WORKS, INC., OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

SEAMING MACHINE.

Application filed October 27, 1921. Serial No. 510,711.

To all whom it may concern:

Be it known that I, HUGH M. ROSS, a citizen of the United States, residing at Woodhaven, in the county of Queens and State of New York, have invented new and useful Improvements in Seaming Machines, of which the following is a specification.

My invention relates to seaming machines and more particularly to machines for affixing the heads to the bodies of cans, this invention being an improvement upon the apparatus disclosed in United States Patent No. 810,245 to Benjamin Adriance and Amos Caleson.

In the machine shown in the said patent, the rotation of the head carrying the tools or operation performing members is started and stopped for each seam. Under this condition, the brake band for the rotating head, especially after considerable use, does not invariably stop the comparatively heavy mechanism sufficiently quickly, and as a result the body of the head and the cam ring which operates the tools sometimes overrun their proper relative positions before the rotation of the head stops, whereby the tools are forced inwardly by the cams so as to prevent the insertion of the can or other article to be operated upon between the tools. Furthermore the starting and stopping of the mechanism takes considerable time and causes objectionable wear on the clutch controlling the starting and stopping of the machine.

An object of my invention is to obviate the above defects. With this end in view, the rotation of the major portion of the moving mechanism in the preferred form of my invention is continuous, only the relative movement between the cam member or other actuating member and the rest of the head being started and stopped for each seam.

Other objects, features and advantages of my invention will appear more fully in the following detailed description and appended claims. In order that my invention may be more clearly understood, attention is hereby directed to the accompanying drawings forming a part of this specification, in which—

Fig. 1 is a side elevation of a machine containing one embodiment of my invention;

Fig. 2 is a front elevation of the same;

Fig. 3 is a top plan view of the same;

Fig. 4 is a horizontal section taken on line 4—4 of Fig. 2;

Fig. 5 is a central vertical sectional view of the upper portion of the machine;

Fig. 6 is a horizontal section taken on line 6—6 of Fig. 5;

Fig. 7 is a horizontal section taken on line 7—7 of Fig. 5; and

Fig. 8 is a sectional view of details of construction.

Referring to the drawings, in a pedestal 1 is journaled a horizontal driving shaft 2 which carries at its inner end two beveled gears 3 and 4, its outer end carrying a pulley 5 whereby power is taken into the machine and the machine driven when the clutch 6 is thrown into operative position by its controlling lever 7 (Fig. 5). The clutch may be of any suitable type and it is thought to be unnecessary to describe the same in detail. The gear 3 is keyed to the shaft 2 so as to rotate therewith but the gear 4 is free to rotate with respect to the shaft unless connected thereto by a clutch 8 (Fig. 5). This clutch, as shown, includes a movable clutch member splined to the shaft and having secured thereto a facing 9 of hardened steel or other wear resisting material, the clutch facing 9 being arranged to co-act with the clutch member 10 of similar material threaded upon the hub of gear 4.

The following mechanism is employed for moving the clutch member 8: A T-shaped lever 11 pivoted, as at 12, to the pedestal has connected to its arm 13 a fork 14 projecting into an annular recess in member 8. The opposite arm 15 of the lever 11 is connected to a spring 16 which tends to move the lever so as to throw the movable clutch member 8 out of mesh or operative relation with the clutch member 10 on the gear 4. For moving the lever 11 against the action of spring 16, a link 17 is connected adjacent one end to the arm 18 of the said lever, the opposite end of the link being connected through a link 19 with a pedal or controlling member 20. As shown, the adjacent ends of the links 17 and 19 are connected for a purpose hereinafter described to a rock arm 21. As shown, the upper end of the link 17 is connected to the arm 18 of the lever 11 by a spring connection 22, whereby the clutch 8 may be readily thrown into operation without jar.

After the clutch member 8 has been thrown into operative position by depression of the pedal 20, it is held in that position until the seaming operation on the cam is complete. To this end, the arm 13 of lever 11 is connected to a horizontal slide 24, the forward end of which is provided with a laterally projecting detent portion 25 (Fig. 6) which has a rear shoulder 26 (Fig. 6) arranged to be engaged by the pin 27 at the upper end of lever 28 when the clutch member 8 is in operative position. The lever 28 is pivoted as shown at 29 for movement about a horizontal axis. A spring 30 tends to hold the lever 28 in operative or latching position.

Referring more particularly to Fig. 5, the forwardly projecting arm 30 at the top of the pedestal has secured thereto, as by screws 31, a post 32 formed with a flange 33 at the lower end thereof. A disk or head 34 surrounds the post 32 and is supported on the flange 33 for rotation coaxially with respect to the said post. Fixed to the disk 34, as by screws 35 is a beveled gear 36 which meshes with the beveled gear 3. To the lower end of the post 32 is secured, as by bolt 37, a block 38 which serves both as the chuck portion of the mechanism to hold the can and head assembled while being operated upon and as a guide for certain parts hereinafter referred to.

At spaced points around the disk or head 34 are arranged sets of devices for controlling the positioning of the operation performing members and tools. I have shown three tools and actuating means therefor but it is understood that the number of tools is immaterial. Except for the tools per se, the devices referred to are identical, and I shall accordingly describe only one of these devices.

Referring to Figs. 6, 7 and 8, a lever 40 is fulcrumed in the disk, its fulcrum being supported by a boss 41 formed thereon and which carries a nut 42 for holding the lever in place. The free end of this lever carries a roller 44 adapted to run in the cam groove 45 at the under face of the block 38. This groove is made to conform to the outlines of the can so that when the disk or head 34 rotates the roller follows a path coinciding with the outline of the can. As shown, the outline is rectangular, the cam groove being co-axial with the head or disk 34. The lever 40 has pivoted thereto and intermediate its ends, as at 46, another lever 47. The inner end of the lever 47 carries a tool 48 which as shown is in the form of a narrow roller. The other end of the lever 47 carries a pin 48^a which bears against the lower arm 49 of a lever which has a vertical pivot portion 50 extending through the head 34 and at the upper end of which are lever arms 51 and 52. The arm 51 carries a rotatable fol-

lower 53 which is arranged to coact with a cam 54. In order to permit adjustment of the position of the tool with respect to the work, the pin 48^a, as shown, is made adjustable so that the relative positions of the levers 47 and 49 may be varied as required, the pin being threaded into the lever 47. The various levers are held in proper relationship with the followers 53 in engagement with the cam by means of the spring or yielding bearing arranged between the levers 40 and 47 intermediate the pivot 46 and the inner ends of the levers. This bearing comprises, as shown, a pin 55 projecting downwardly from the lever 40 and engaging with a spring pressed pin 56 carried by lever 47. (See Fig. 8).

Each of the levers 47, as stated, carries a suitable tool. Where three of these tools are used, as shown, the first may be employed to effect a preliminary turning down of the projecting flange on a can cover, such as shown in Fig. 11 of the aforesaid Patent 810,245, the second to perform an intermediate shaping of the edge as shown in Fig. 12 of said patent, and the third to finish the seam as shown in Fig. 13 of the said patent. The tools per se are preferably arranged under the rollers 44 and take, together with the levers 47 carrying the same, their general direction of movement from the movement of the lever 40; but the actuation of the tools, whereby they are caused to change the shape of the metal is imparted thereto by the action of the cams 54 on the levers coacting therewith, whereby the tool levers 47 are shifted by the lever arms 49.

Considering the cam more in detail, the head or disk 34 has a ring 60 mounted thereon for rotation co-axially with the said disk or head. This ring is provided, as shown, with three cams 54 arranged at different elevations, each of these cams coacting with one of the followers 53. This ring is also provided with a beveled gear 62 meshing with the gear 4. It is thought unnecessary to go into detail as to the shapes of these cams but it may be stated generally that each of the cams is provided with a pocket portion 54^a, which permits the tools to be held a sufficient distance away from the axis of the apparatus to permit the ready positioning of the can or other article to be operated upon between the tools, it being understood that at the beginning and end of the formation of a seam on a can all of the followers 53 occupy the recessed portions 54^a of corresponding cams. The remainder of the cams are formed so as to bring the tools successively into operation and to prevent the arms 52 from moving out sufficiently far to release the latch 28 as hereinafter described.

To effect the release of the latch 28, the levers 52 are provided with upstanding pro-

jections 63 which move outwardly into the path of projection 64 (see Fig. 2) of the latch lever 28 to release the latter when the followers 53 move into the recessed portions 54^a of the cams at the end of the seaming operation.

The can or other article to be operated upon is adapted to be supported upon a table 65 carried by a shaft 66 which is vertically movable in bearings in the pedestal 1. This shaft is prevented from rotating by means of an arm 67 which is secured to the shaft and has a sliding non-rotating engagement with the pedestal. For elevating the table so as to force the can against the chuck, the arm 21 is secured to and is adapted to rotate about its axis, a cam member 68 which coacts with a roller 69 on a sleeve 70 slidable on a shaft 66 and carrying a spring 71 by which shaft 66 and table 65 are supported by reason of the engagement of the spring with the under surface of the member 67. It will be seen that by the depression of the pedal 20 not only is the clutch member 8 thrown into operative position but the table 65 is also elevated into operative position. By reason of the spring 71 the arresting of the movement of the table 65 need not arrest the movement of the clutch member 8 into operative position and the cover and can are held together and in place by spring pressure.

The pitch of the gears 3, 4, 36 and 62 must, of course, be so selected as to effect the necessary relative movement between the cam ring 60 and the followers 52 on the tool actuating devices. As an example, these gears may be so pitched that the disk or head 34 is rotated six times while the ring 60 is rotated five times.

When the machine is at rest the tools are, as stated, in their outermost position, the cam followers 53 being located in the recesses 54^a of the cams. The machine is started by shifting lever 7 to throw the clutch 6 into operation whereupon the head 34 and the movable parts connected thereto rotate continuously. The clutch member 8 being in its unclutched or inoperative position, the gear 4 is free to be rotated with respect to shaft 2 by the gear 62, the ring 60 being rotated simultaneously with the head 34 by reason of the coaction of the followers 53 with the recesses 54^a.

A can or other article to be operated upon having been placed upon the table 65, the pedal 20 is depressed whereupon the clutch member 8 is thrown into operative position causing the power to be transmitted from the driving shaft to the ring 60 and the table 65 is elevated to bring the head of the can against the stationary chuck on member 38. At the same time the slide 24 is moved forwardly, the latch pin 27 engaging behind the shoulder 26 to hold the clutch member 8

and the table in operative position. The head 34 and cam ring 60 are now being rotated with respect to each other so that the cams 54 act upon the cam followers 53 to actuate the tools in succession to produce the desired seam. At the end of one rotation of the head 34 with respect to the cam ring 60, the cam followers 53 will drop into the recesses 54^a, the pin 63 being outwardly sufficiently far to enable the one which is nearest the extension 64 on the latch lever 28 to trip or release the said lever, whereupon through spring 16 the latch 24 and the clutch member 8 are moved into inoperative position and the table 65 lowered. The head 34 of the machine and the parts carried thereby and driving the same continue to rotate but there is no longer any relative movement between the cams 54 and their followers 53; so that after removal of the can which has been operated upon and placing a new one upon the table upon the depression of the pedal, the only rotation which need be imparted to the mechanism at the top of the machine is a slight rotation between the disk 34 and its operating means on the one hand, and the ring 60 and its operating means on the other hand. As a result, there is little wear upon the machine in operation and it can be operated with considerable speed.

While I have described a machine adapted for forming a true or lock seam, my invention is adapted for forming other kinds of seams and for many other uses. Furthermore, modifications may be made in the structure shown without departing from the spirit of my invention.

Having described my invention, what I claim and desire to secure by Letters Patent of the United States is:

1. The combination of a plurality of rotatable members, operation performing means carried by one member and means for actuating said operation performing means carried by the other member, driving means for rotating one of said members, power transmitting means for rotating the other member relatively to said first-named member, said power transmitting means being arranged to be operatively connected to or disconnected from said driving means, latching means for retaining said power transmitting means connected to said driving means, and automatic means including a device carried by one of said members for rendering said latching means inoperative.

2. The combination of a plurality of coaxial rotatable members, driving means for rotating one of said members, power transmitting means for rotating the other member relatively to said first-named member, said power transmitting means being arranged to be operatively connected to or disconnected from said driving means, latching means for retaining said power transmitting

means connected to said driving means, and automatic means including a device carried by one of said members for rendering said latching means inoperative.

3. The combination of a plurality of rotatable members, driving means for rotating one of said members, power transmitting means for rotating the other member relatively to said first named member, said power transmitting means being arranged to be operatively connected to or disconnected from said driving means, latching means for retaining said power transmitting means connected to said driving means, and automatic means including a device carried by one of said members for rendering said latching means inoperative.

4. The combination of coaxial rotatable members, driving means for rotating one of said members, power transmitting means for rotating the other member relatively to said first named member, controlling means co-acting with said power transmitting means to operatively connect the same to or disconnect the same from said driving means, and automatic means including a releasing device carried by one of said members for operating said controlling means when said members reach predetermined relative positions.

5. The combination of a plurality of coaxial rotatable members, operation performing means carried by one member, a cam for actuating said operation performing means carried by the other member, driving means for rotating one of said members, power transmitting means for rotating the other member relatively to said first-named member, said power transmitting means being arranged to be operatively connected to or disconnected from said driving means, means for retaining said power transmitting means connected to said driving means, and automatic means including a device carried by one of said members for rendering said retaining means inoperative.

6. The combination of a plurality of coaxial rotatable members, driving means for rotating one of said members, power transmitting means for rotating the other member relatively to said first-named member, said power transmitting means being arranged to be operatively connected to or disconnected from said driving means, means tending to maintain the same disconnected from said driving means, means latching the same connected to said driving means, and automatic means including an arm carried by one of said members for releasing the latching means when said members reach predetermined relative positions.

7. The combination of a plurality of coaxial rotatable members, driving means for rotating one of said members, power transmitting means for rotating the other mem-

ber relatively to said first-named member, said power transmitting means being arranged to be operatively connected to or disconnected from said driving means, means tending to maintain the same disconnected from said driving means, a latch adapted to hold the same connected to said driving means, means for setting said latch, and automatic means including a device carried by one of said members for releasing the latch when said members reach predetermined relative positions.

8. The combination of a plurality of movable members, a cam on one of said members, an operation performing device carried by the other member and movable by said cam, means for rotating one of said members and for moving the other member relatively to said first-named member, said means including driving means for one of said members and means adapted to be operatively connected to or disconnected from said driving means, means tending to maintain said last named means disconnected from said driving means, a latch adapted to hold the same connected to said driving means, means for setting said latch and automatic means including means carried by one of said members for releasing the latch when said device and cam reach predetermined relative positions.

9. The combination of a plurality of concentric rotatable members, a cam on one of said members, an operation performing device carried by the other member and movable by said cam, means for rotating one of said members and for rotating the other member relatively to the same, said means including driving means for one of said members and means adapted to be operatively connected to or disconnected from said driving means, means tending to maintain said last-named means disconnected from said driving means, a latch adapted to hold the same connected to said driving means, means for setting said latch and automatic means for releasing the same when said device and cam reach predetermined relative positions.

10. The combination of a plurality of coaxial rotatable members, driving means including a horizontal driving shaft for rotating one of said members, a gear on said shaft in driving relation to the other member, means whereby said gear may be operatively connected to said driving means to rotate the member coacting therewith relatively to the other member, and automatic releasing means carried by said members for rendering said connecting means inoperative when said members reach predetermined relative positions.

11. The combination of a plurality of coaxial rotatable members, a cam on one of said members, a follower on the other mem-

ber coacting with said cam, driving means including a horizontal driving shaft for rotating one of said members, a gear on said shaft in driving relation to the other member, means whereby said gear may be operatively connected to said driving means to rotate the member coacting therewith relatively to the other member, and automatic releasing means carried by said members for rendering said connecting means inoperative when said cam and follower reach predetermined relative positions.

12. The combination of a plurality of coaxial rotatable members, a cam on one of said members, a follower on the other member coacting with said cam, an operation performing device movable by said follower, driving means for rotating one of said members, a gear in driving relation to the other member, means whereby said gear may be operatively connected to said driving means to rotate the member coacting therewith relatively to the other member, and automatic releasing means carried by said members for rendering said connecting means inoperative when said cam and followers reach predetermined relative positions.

13. The combination of means for holding an article, operation performing means, means for actuating the latter, including a cam for controlling the movement of said operation performing means in accordance with the outline of the article and a second cam coaxial with said first-named cam for controlling the operating movement of said operation performing means, driving mechanism for effecting a relative movement between two of said means, power transmitting means connected with said driving mechanism for effecting a relative movement between the third means and one of the other means, and means for disconnecting said power transmitting means from said driving mechanism.

14. The combination of means for holding an article, operation performing means, means for actuating the latter, including a cam for controlling the movement of said operation performing means in accordance with the outline of the article and a second cam coaxial with said first-named cam for controlling the operating movement of said operation performing means, driving means for effecting a relative movement between said holding means and said operation performing means, power transmitting means including a clutch for effecting a relative movement between said operation performing means and actuating means, and means for disconnecting said clutch.

15. The combination of means for holding an article, operation performing means, means for actuating the latter, including a cam for controlling the movement of said operation performing means in accordance

with the outline of the article and a second cam coaxial with said first-named cam for controlling the operating movement of said operation performing means, driving means for effecting a relative movement between said holding means and said operation performing means, power transmitting means including a clutch connected with said driving means for effecting a relative movement between said operation performing means and actuating means, means for moving said clutch into operative position and automatic releasing means controlled by said operation performing means for moving the clutch out of operative position when said operation performing means and actuating means have reached predetermined relative positions.

16. The combination of a plurality of coaxial members, operation performing means carried by one of said members, a cam for controlling the movement of said operation performing means in accordance with the outline of the article operated upon, a second cam coaxial with said first-named cam and carried by the other member for controlling the operating movement of said operation performing means, a work support, driving means for one of said members, means including a clutch for effecting a relative movement between said members to cause said cams to actuate said operation performing means, and means having a single controlling member for shifting said clutch and effecting between said support and operation performing means a relative movement with respect to their operative positions.

17. The combination of a plurality of coaxial members, operation performing means carried by one of said members, a cam for controlling the movement of said operation performing means in accordance with the outline of the article operated upon, a second cam coaxial with said first-named cam and carried by the other member for controlling the operating movement of said operation performing means, a work support, driving means for one of said members, means including a clutch for effecting a relative movement between said members to cause said cams to actuate said operation performing means, and means having a single controlling member and spring connections between the same and said support and clutch for shifting said clutch and effecting between said support and operation performing means a relative movement with respect to their operative positions.

18. The combination with means for holding an article to be operated upon, of a lever, a tool on said lever adapted to operate on the article, means for guiding said lever to move said tool into approximate

coincidence with the contour of the article, and other means coacting with said lever for actuating said tool, said last-named means including a cam, a lever actuated thereby, means tending to hold said levers in engagement with each other, and means for adjusting the relative positions of said levers.

19. The combination with means for holding an article to be operated upon, of a lever, a tool on said lever adapted to operate on the article, means including a cam and a lever for guiding said first-named lever to move

said tool into approximate coincidence with the contour of the article, means including another cam and a follower coacting there- 15
with and with said first-named lever for actuating said tool, and means arranged between said levers and tending to yieldingly hold said follower in engagement with said cam. 20

In testimony whereof, I have signed my name to this specification.

HUGH M. ROSS.