J. A. GRAY.

CAN HEADING MACHINE.

APPLICATION FILED AUG. 27, 1908. RENEWED MAR. 16, 1911.

1,002,389. Patented Sept. 5, 1911.

4 SHEETS—SHEET 1.

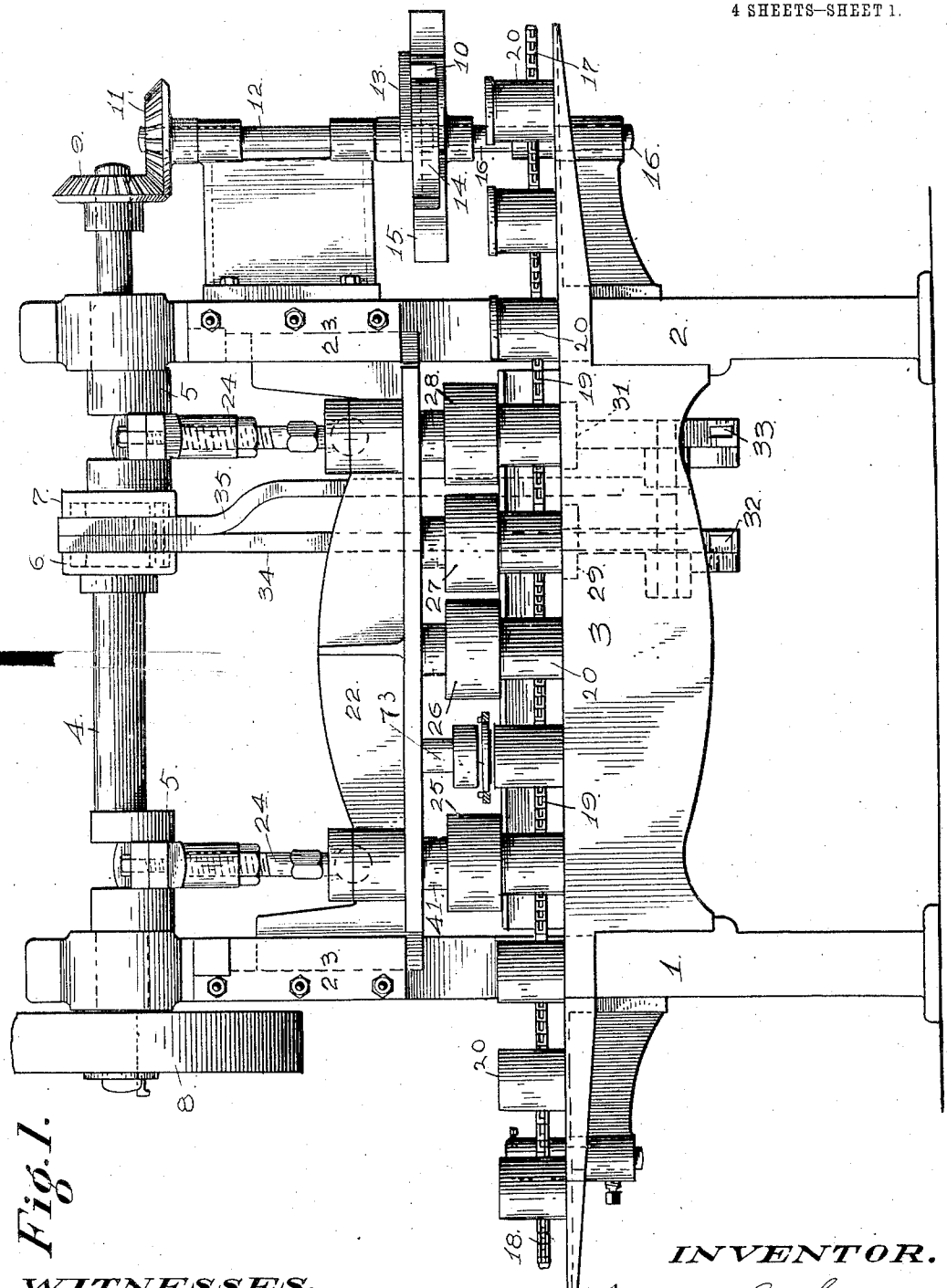

Fig. 1.

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4 SHEETS—SHEET 2.

Fig. 2.

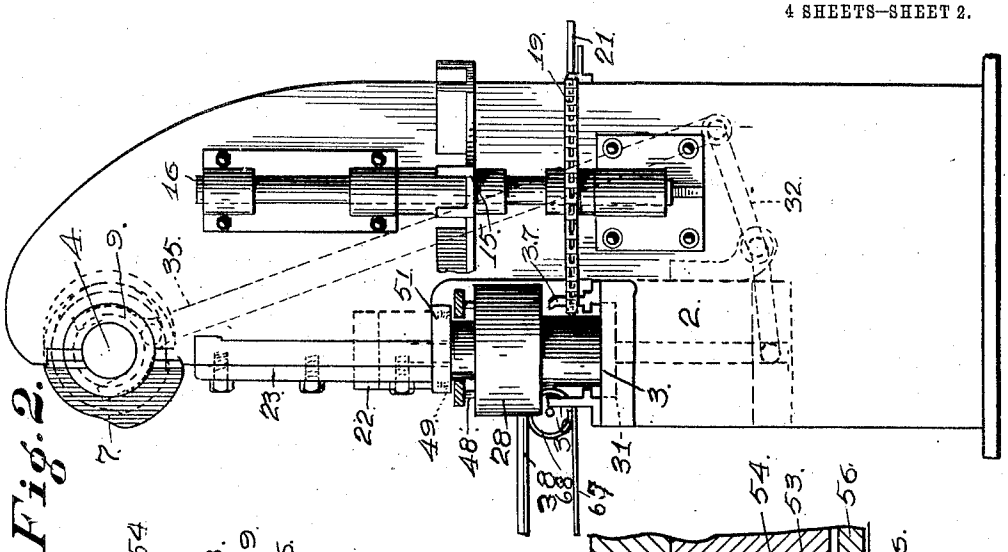


Fig. 6.

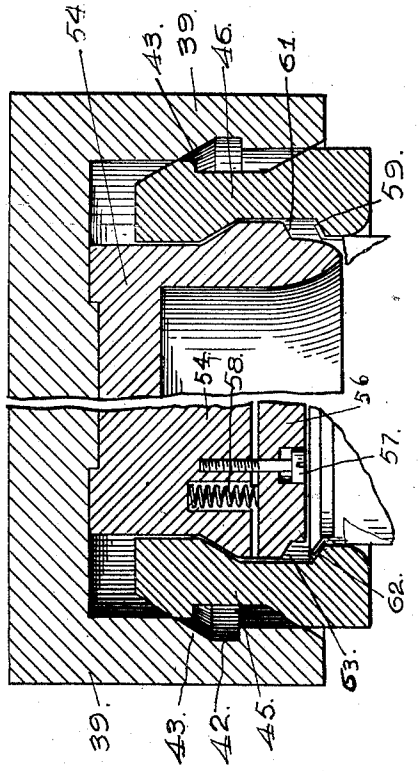


Fig. 8.

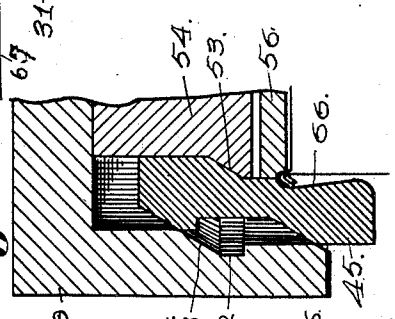


Fig. 7

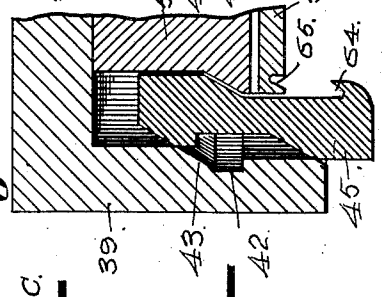
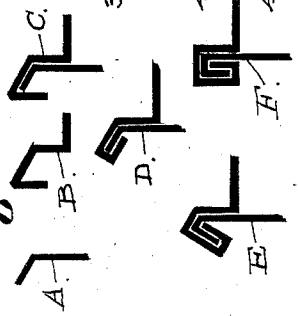


Fig. 5.

Fig. 4.



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4 SHEETS—SHEET 3.

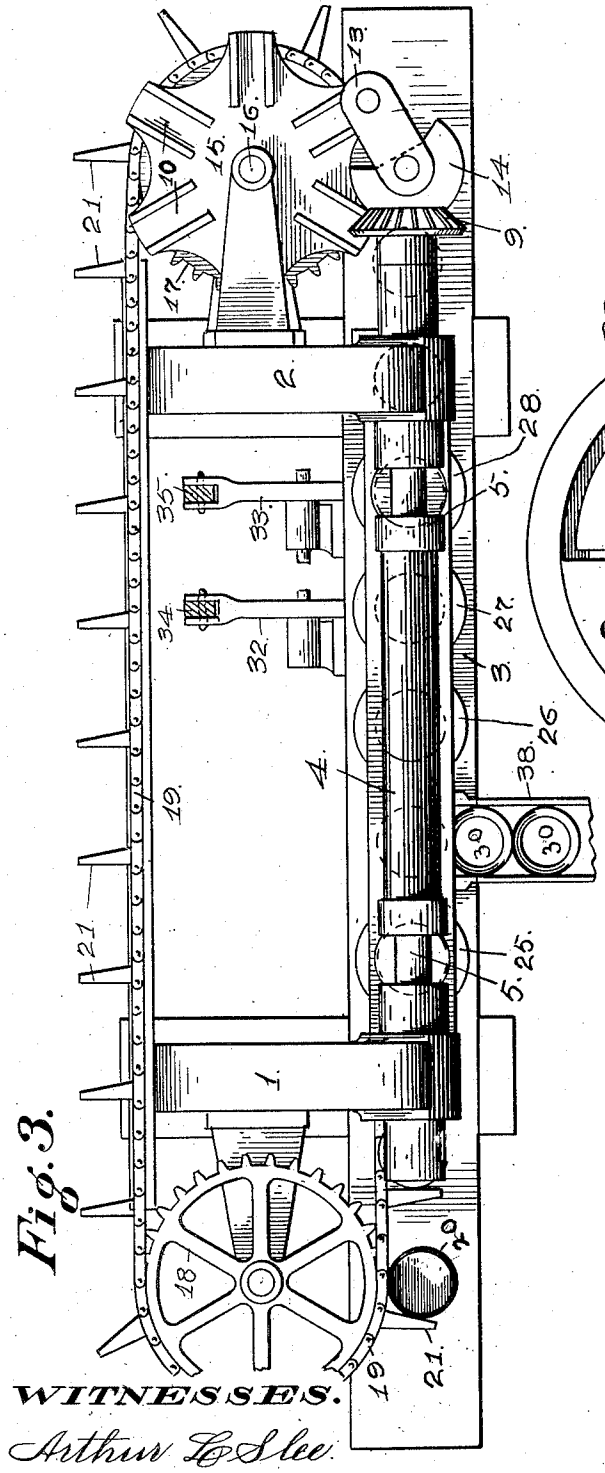

Fig. 3.

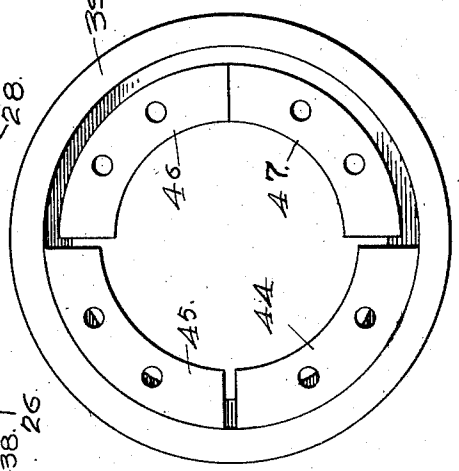

Fig. 9.

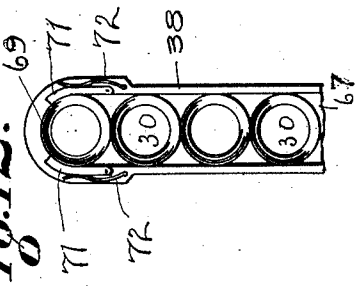

Fig. 12.

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4 SHEETS—SHEET 4.

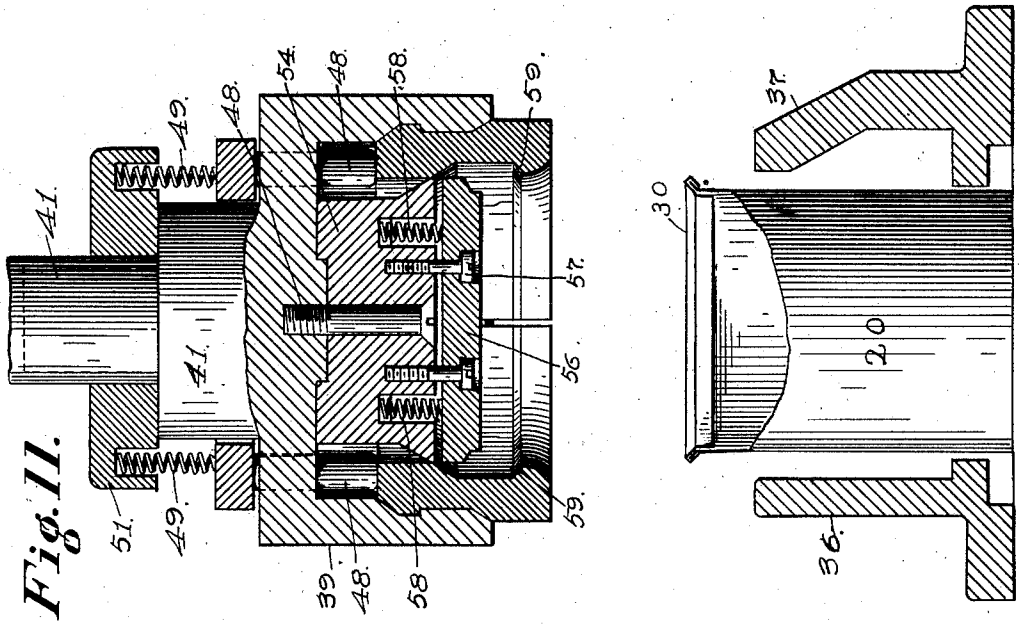

Fig. 11.

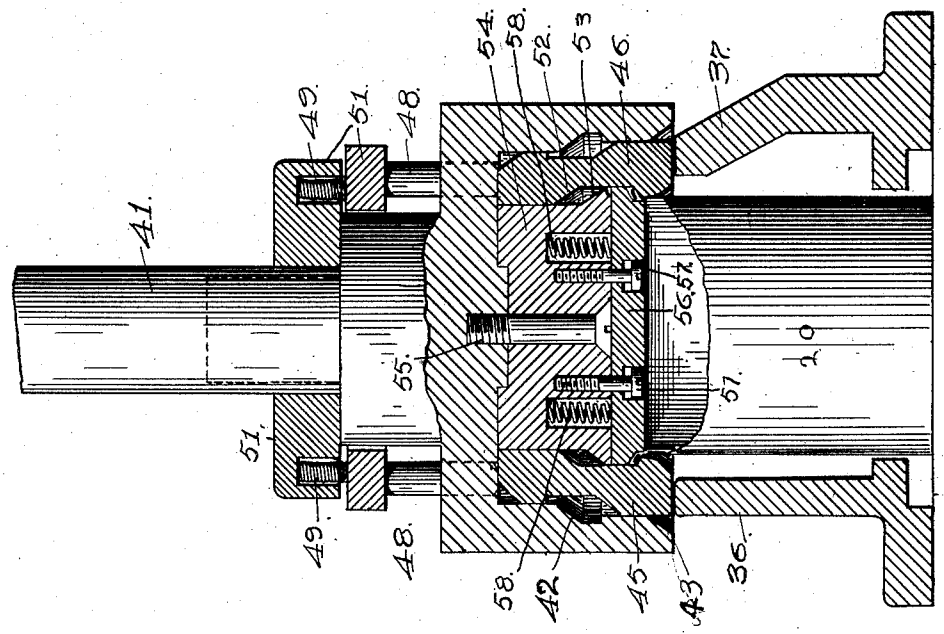

Fig. 10.

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UNITED STATES PATENT OFFICE.

JAMES A. GRAY, OF SAN FRANCISCO, CALIFORNIA.

CAN-HEADING MACHINE.

1,002,389. Specification of Letters Patent. **Patented Sept. 5, 1911.**

Application filed August 27, 1908, Serial No. 450,537. Renewed March 16, 1911. Serial No. 614,954.

To all whom it may concern:

Be it known that I, JAMES A. GRAY, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Can-Heading Machines, of which the following is a specification.

My present invention relates to improvements in the manufacture of sheet metal cans and more particularly to means whereby the can-heads or can-tops and can-bottoms are seamed to the can-bodies.

It is my object to produce a machine of simple construction, of rapid and positive operation, and which can be manufactured at low cost, whereby the can-heads are secured to the can-bodies in such a manner that a perfect and tight can is manufactured.

A further object of my invention is to provide a means whereby a sheet metal can is manufactured that is free from the use of solder in its production, and thereby eliminate the objectionable features that are attributed to cans so manufactured.

Further objects are to simplify and cheapen the manufacture of sheet metal cans, to increase the rate of production, and to produce true and hygienic cans.

All these objects are accomplished by a machine, an embodiment of which is shown in the accompanying drawings, which form a part of this specification, and wherein:

Figure 1, is a front elevation of the entire machine. Fig. 2, is an end elevation of the same. Fig. 3, is a plan view of the same. Fig. 4, is a series of diagrams showing the successive stages in the process of seaming together the can-heads and the can-bodies. Figs. 5, 6, 7 and 8 are broken detailed views of sections of the various plungers which perform the successive stages in the seaming. Fig. 9, is a detail view of a plunger containing the quadrants showing a portion of the ring in its position when at its smaller diameter and a portion of the ring in its position when at its larger diameter. Fig. 10, is a detail view of one plunger in section during operation. Fig. 11, is a view of the plunger in section when raised and in position for operation. Fig. 12, is a plan view of the can head feeding chute.

Similar numerals refer to similar parts throughout the several views.

Referring more particularly to the drawings the numerals 1 and 2 are supports of suitable size and shape on which is the table or platform 3. Journaled in the upper ends of the supports is the shaft 4, on which are the cranks 5, and the cams 6 and 7. Also on the shaft 4 is the drive pulley 8 and the bevel gear 9. The bevel gear 9 is in mesh with the bevel gear 11 on the shaft 12, which is suitably journaled and supported on the support 2. On the lower end of the shaft 12 is the crank 13 and the sector 14. Near the outer end of the crank 13 is a roller provided to engage in the slots 10 of the wheel 15 which is mounted on the shaft 16 that is also suitably journaled and supported on the support 2. This crank 13 in its revolutions will give intermittent motion to the wheel 15 and the shaft 16. The sector 14, in its revolutions with the crank 13 and the shaft 12, will, in its movement, engage in the concave depressions in the periphery of the wheel 15, and so lock the wheel 15 against movement while the crank 13 is in that part of the arc of its motion in disengagement with the slots 10. On the shaft 16 is the sprocket wheel 17 operating in the same plane as the surface of the table 3. Suitably journaled and supported from the support 1 is an idler sprocket wheel 18 revolving in the same plane as the sprocket wheel 17, and on these sprocket wheels 17 and 18 is operated the feed chain 19, which is provided with projections or fingers 21, at equal and suitable distances apart so that the selected feed of the can-bodies 20 to the selected parts of the machine where the various stages of the seaming operation are performed will be positive.

The beam 22 has a vertical movement in the guides 23, on the supports 1 and 2, and motion is given to this beam by means of the cranks 5 and the adjustable links 24. On the lower side of the beam 22 are the plungers 25, 26, 27 and 28, which are hereinafter more particularly described.

In openings in the surface of the table 3 and directly below the plungers 27 and 28 are vertically movable disks 29 and 31, which normally have their upper surfaces in the same plane as the surface of the table. These disks 29 and 31 are adapted to be raised above the plane of the surface of the table and lowered again to normal positions at the desired time, in the operation of the machine, by means of the levers 32 and 33, the links 34 and 35, and the cams 6 and 7.

On the surface of the table 3 are parallel

guides 36 and 37 that are placed beneath the plungers 25, 26, 27 and 28 and so provided that the cans pass between them, guiding the cans to positions beneath the plungers in there progress through the machine. The rear guide 37, as I have shown it, is so adapted that the feed chain passes between it and the can-bodies in a channel provided along the wall of the guide. These guides extend from a suitable point on the feeding side of the table before the plunger 25 is reached, as the can-bodies go into the machine, to a point on the discharge side of the table after the can has received its final operation by the plunger 28 in the seaming process. These guides also serve as stops in the operation of the plungers 25, 26, 27 and 28, the operation of which will hereinafter be more fully explained.

In the drawings I have shown four plungers, each of which performs a distinct operation in the successive stages of forming the seam of the can-head with the can-body. In Fig. 4, I have shown the various folds of the sheet metal in each of the successive stages. At A is shown a section of a can-body as it would be flared by the plunger 25. A sectional detail of this plunger is shown in Fig. 6. At B (Fig. 4) is shown a section of the prepared can-head. At C (Fig. 4) is shown a section of the can-head in place on a section of the flared can-body. At D (Fig. 4) is shown a section of the can-head and the can-body in which the outer hooked rim of the can-head is turned against the outer flared section of the can-body, as performed by the operation of the plunger 26. A detailed section of plunger 26 is shown in Fig. 5. At E (Fig. 4) is shown in section the next stage of the seaming process which is performed by plunger 27, whereby the hooked rim of the can-head and the flared portion of the can-body, which have by the preceding stage been folded together, are now turned downward toward the can-body, thus forming an acute angle in relation to the plane of the can-body. A detailed section of plunger 27 is shown in Fig. 7. At F (Fig. 4) is shown in section the final stage of the seaming process as performed by plunger 28, a detailed section of which is shown in Fig. 8. In this stage the folds of the can-head and the can-body, that have by the preceding processes been folded so as to form an acute angle with the plane of the can-body, are now folded tightly together and pressed against the side of the can-body.

I provide a means for feeding the can-heads to positions on the can-bodies at the proper stage of the operation of the machine, as shown by the feed chute 38, which is placed between the plungers 25 and 26. The can-heads 30 are fed into this chute with their inner surfaces downward, and they are carried toward the discharge end of the chute by the movement of the endless belt, on carrier, 67, which forms a portion of the bottom of the chute. This belt is carried on the pulley 68, at its discharge end, which can be mounted in any suitable manner in position above the table 3. The other or receiving end of the chute can be located at any desired distance and at this end a second pulley or other suitable device may be provided, (but which is not shown in the drawings), over which the belt may be carried and driven by any suitable means. At the lower end of the chute is an opening 69 directly over the position the can-bodies 20 assume in the step they take through the machine when they receive the can-heads 30. The can-heads, when they reach this opening, are held in position directly over the opening by the fingers 71 which press against the edges of the can-heads by means of the springs 72. The can-body, by the intermittent movement of the feed chain, assumes a position under the opening in the chute. Then the plunger 73, on the beam 22, descends, carrying the can-head from the fingers through the opening and forcing it into position on the can-body.

In Figs. 9, 10 and 11 I show in detail the construction and operation of the plungers. These plungers are annular cup-shaped members each having an outer member 39, which is suitably and rigidly attached to the beam 22, by the shank 41. On the inner surface of the annular member 39 is an annular angular groove 42. The inner edge of the rim of the member 39 is beveled at an angle 43, said angle 43 coinciding with the angle of the annular groove 42. Within the member 39, and bearing against its inner surface are the four quadrant pieces 44, 45, 46 and 47, as shown in Fig. 9. These pieces are provided with projections on their outer surfaces which fit into, and coincide with, the angle 42 and the angle of the beveled rim 43 of the member 39. These angular surfaces form cams in the operation of the plunger.

When the projections of the quadrants are fitted into the angular groove 42 and the beveled surface on the rim of the member 39 the quadrants are of such a length that there is space between the ends of them as shown by the quadrants 44 and 45, in Fig. 9. When the quadrants are forced upward into the cavity of the member 39, the angular projections on the inner surface of the member 39 act as cams on the angular projections on the outer surfaces of the quadrants, thus forcing the quadrants inwardly and the quadrants then assume the positions shown by the quadrants 46 and 47 in Fig. 9. The quadrants in the two positions described form circles of two diameters. In the illustration, in Fig. 9, I have shown two of the quadrants in the

position of the larger diameter, and two in the position of the smaller diameter, but it will be understood that in the operation of the plunger all four quadrants act together in making the larger and the smaller diameters.

In openings in the upper surface of the member 39 are the pins 48. The lower ends of these pins are in engagement with the upper edges of the quadrants, and slidably movable on the said quadrants. In Fig. 9 I have shown two of these pins in engagement with each of the quadrants. At the upper ends of the pins are the springs 49, which are held in place and bear against the plate 51 which is suitably secured to the shank 41. These springs 49 are provided to bear against the pins 48 which in turn bear against the quadrants 44, 45, 46 and 47, and tend to force the said quadrants downward. The inner surfaces of these quadrants are provided, as shown, with annular angular grooves 52, which coincide with and engage an annular angular projection 53, on the piece 54, which is secured within the center of the cavity of the member 39 by the screw 55, or other suitable means. In the plunger 25 I prefer that this member 54 be solid or a single piece, but in plungers 26, 27 and 28 I provide a pad 56 at the lower face of this member 54. The pad 56 is a metal disk. I have shown it in Figs. 10 and 11 supported and reciprocally movable on the fillister screws 57. Between the disk 56 and the member 54 are the springs 58, which tend to force the disk downward and away from the member 54 until it is stopped by means of the heads of the fillister screws 57.

The plunger 25 is designed to flare the rims of the can-bodies. In this plunger the quadrants are provided with an annular angular groove 59 on their inner surfaces as shown in Fig. 6. This surface forms an angle with the plane of the inner surface of the quadrants. I have shown this as an obtuse angle, but I do not confine myself in construction to any precise form of angle. The member 54, in this plunger 25, is of one piece, and is tapering at its outer and lower surface so that it will readily enter the interior of the can-body, and adjust the can-body in exact position within the plunger. The member 54 is provided with an annular angular projection 61 on its outer surface, which coincides with the plane of the angle 59 of the annular angular groove of the quadrants. I prefer in construction that the point of this angle, made with the surface of the projection 61 and the plane of the inner surface of the quadrant, be rounded, or so molded as to form a curve, so as to give an easier progress to the edge of the can-body when the member comes into engagement with the can-body. The movement of this plunger is so adapted that when the quadrants come into engagement with the stops 36 and 37, and close on the can-body, the portion of the can-body to be flared projects upward into the cavity of the plunger above and beyond that portion of the quadrants that are in engagement with the can-body. The annular angular projection on the member 54, in the cavity of the plunger as the plunger further descends, presses that part of the can-body that extends above the quadrants outwardly until it is brought into engagement with and stopped by the coinciding angular projection on the inner walls of the quadrants.

The plunger 26 is designed to turn the outer bend or lip of the can-head over the flare of the can-body as shown at D in Fig. 4. In this plunger the quadrants are also provided with an annular angular groove 62, on their inner surfaces, as shown in Fig. 5. I have shown the plane of this angle forming an obtuse angle with the plane of the inner surface of the quadrants, but I do not confine myself in construction to the precise form of this angle. The member 54, in this plunger, is provided with a pad 56 as described. This pad is designed to adjust the surface of the plunger to any unevenness in the can-bodies and can-heads, and is provided at its lower surface to fit within the circumference of the rim of the can-head. On the outer surface of the pad, or disk, 56, of the member 54, is an annular angular projection 63, the angle of which coincides with the angle of the annular angular groove 62 of the quadrants. I prefer in construction that the point of the angle made with the surface of the projection 62 and the plane of the inner surface of the quadrants, be also rounded, or so molded as to form a curve, so as to give an easier progress to the edge of the can-head when the can-head edge comes into engagement with the quadrants. The movement of this plunger is so adapted that the quadrants engage, or close on, the can-body just below the now flared portion of the can-body that now has a can-head over it. The can-head is so prepared that it has an annular rim or lip that extends downward around the flared portion of the can-body. The annular angular projection 63, in the pad or disk 56, as the plunger further descends, compresses the rim of the can-head and the flared part of the can-body together between the projection 63 and the projection 62, causing the rim of the can-head to be turned under and against the under, or outer, side of the flared part of the can-body.

The plunger 27 is designed to turn the now folded portions of the can-head and the can-body to an acute angle with the plane of the can-body, as shown at E, in Fig. 4. In this plunger the inner surfaces of the quadrants are provided with an annular angular groove 64, as shown in Fig. 7. The

plane of the angle, of this angular groove 64, forms an acute angle with the plane of the inner surface of the quadrants. The member 54 in this plunger is preferably provided with a reciprocally movable disk, or pad, on its lower surface as hereinbefore described. On the lower surface of this disk, or pad, is an annular angular groove and projection 65, which coincides with the groove and projection 64 in the quadrants. The movement of this plunger is so adapted that the quadrants engage, or close on, the can-body just below the now partially seamed portions of the can-body and can-head. Then as the plunger further descends the annular angular projection 65, on the pad, or disk 56, of the member 54, comes into contact with those folded portions of the can-head and the can-body, and forces them downward into the groove 64. This partially seamed portion of the can-body and the can-head is now hooked into the groove 64. To release the can-body from this plunger I provide the vertically movable plate 29, which in its upward motion at this point coincides with the upward motion of the plunger, and raises the can-body a sufficient distance to clear the partially seamed portions of the can-body and the can-head from the groove 64 before the quadrants begin to assume their position of the larger diameter.

The plunger 28 is designed to turn the folded portions of the can-head and can-body, after the can leaves the preceding plunger 27, tightly against the sides of the can-body as shown at F, in Fig. 4. In this plunger the inner surfaces of the quadrants have an annular groove or depression 66, as shown in Fig. 8. This groove is deeper at its upper part than at its lower part. The member 54, in this plunger, is also preferably provided with a reciprocally movable disk or pad 56 at its lower surface, as hereinbefore described. The lower surface of this disk is provided to fit over and within the depression of the upper surface of the can-head. In the plane with the table, and directly under this plunger, is the vertically movable plate 31, that is operated by means of a cam on the drive shaft, and a link and a lever as before described. This plate, on which the can-body now rests, rises to a required distance carrying the can-body upward with it. This motion takes place as the plunger begins to descend. The annular groove 66, provided in the quadrants in the plunger, are so adapted that they, in their movement, engage the can-body in such a manner that the partially seamed portion of the can-head and the can-body are within the upper part of the groove in the quadrants, or in that part of the groove in the quadrants where the annular groove has its largest diameter. As soon as the quadrants engage the can-body, in the movement of the plunger, the plate 31, on which the can-body rests, by action of the cam, and link, and lever, returns to its normal position in a plane with the top of the table. The annular piece 56, within the cavity of the plunger, descends with the plunger and engages with the upper surface of the can-head. In this motion it forces the can-head and the can-body downward, as the plate beneath the can-body descends. The quadrants, during this motion, remain stationary at their smaller diameter. As before described, the annular groove within the inner surfaces of the quadrants is such that the diameter of the circle formed by the groove in the quadrants is greater at the upper part of the groove than at the lower part of the groove. It will be seen that when the can-head and the can-body is driven downward the seamed portion will be forced into that part of the ring with the smaller diameter, with the result that the partially seamed portion of the can-head and the can-body, which at the beginning of the operation formed an acute angle with the plane of the can-body, will be forced tightly against the side of the can-body, thus completing the seaming operation. As another means of performing this last stage in the seaming operation with my invention, I disconnect the mechanism operating the plate 31 in the table beneath the plunger, making the table at this point stationary. The movement of the quadrants is so timed that they assume the position of their smaller diameter after the member 56, in the cavity of the plunger, has come into engagement with the top surface of the can-head. The quadrants will then, in their movement, compress the partially seamed portions of the can-head and the can-body, which now form an acute angle with the plane of the can-body, inwardly against the side of the can-body, thus completing the seaming operation.

In operating my invention, the can-bodies are fed to the machine on the left side of the table, one can-body between each of the fingers of the feed chain. The can-bodies are then carried along to the right between the guides by the regulated intermittent motion of the feed chain. The feed is so provided, by means of the mechanism herein described, that the can-body will be carried to a point directly beneath the first of the plungers. At that point the motion of the feed chain is arrested. This plunger, as described, is adapted to flare the upper rim of the can-body. At the moment the feed chain is stopped in its motion the plunger with its cavity over the can-body descends. In its downward movement a portion of the lower surfaces of two of the quadrants in the plunger are brought into contact with the upper surface of the rear guide, or stop, and a portion of the lower surface of the other

two quadrants contact with the upper surface of the front guide, or stop. These guides arrest the downward movement of the quadrants, but the cup-shaped member of the plunger still continues in its downward motion. This causes the angular surfaces on the inner surface of this last mentioned member to act on the angular surfaces on the outer surface of the quadrant with a cam motion. This forces the quadrant member in the plunger to move inwardly, thus forcing the quadrant to form the smaller diameter as described. It will be seen that the quadrants thus surround and are moved to engage the can-body. The plunger in its further downward movement will cause the annular member, centrally located within its cavity, to enter the interior of the can-body, and the annular projection on this member will press against the inside of the rim of the can-body forcing the rim outwardly until it is arrested by the angular surface of the annular groove in the quadrants. The pins which bear against the quadrants through the openings in the upper cap or wall of the plunger are forced upward with the movement of the quadrants when they come into engagement with the guides or stops. These pins in turn compress the springs that are inserted between them and the plate on the shank, as described. At this point the plunger begins to return to its normal position. As it rises, the annular member within the center of the cavity of the plunger is lifted away from the flared upper rim of the can-body. Also as the plunger rises, the compressed springs bear down on the pins which in turn tend to force the quadrants downward. As the motion continues the inner annular angular surfaces in the quadrants are brought into engagement with the outer annular angular surface of the member in the interior of the cavity of the plunger. These angular surfaces have a cam motion, which force outwardly the quadrants and cause them to assume the larger diameter, as described, and so release the can-body. As this is done the can-body is moved forward another step in its progress through the machine by the provided intermittent motion of the feed chain. On this second step I provide for placing the can-heads, which have been previously prepared, in the required position on and over the now flared can-bodies. This is done by means of the feed chute provided from either the front or the back of the machine as will be found most convenient and a plunger. In the drawings I have shown it at the front of the machine. The next, or third step, carries the can-body, which now has a can-head in place over it, by the movement of the feed chain, under the next plunger in the line of movement. The quadrants are closed tightly about the can-body by exactly the same movement as in the previous plunger. Then as the plunger descends the outer angular rim or lip of the can-head is turned under and against the flared portion of the can-body. The releasing motion and the return to the normal position of this plunger and its parts is similar to that of the plunger previously described. As the releasing motion is completed the feed chain again takes motion and the can-body is carried forward under the next succeeding plunger. The quadrants of this plunger are firmly clasped about the can-body. Then as the plunger continues to descend the partially formed seam of the can-body and the can-head is turned downward into the angular recess in the quadrants. This seamed portion is now at an acute angle with the plane of the can-body and is hooked into the annular angular groove in the quadrants. Now as the plunger begins to rise the plate in the table on which the can-body now rests also rises, carrying the can-body upward with it and lifting the hook-shaped portion of the seam from the recesses in the quadrants before the quadrants begin to assume their position of the larger diameter. The plunger then resumes its normal position in such manner as the plungers already described and the plate in the surface of the table resumes its position in the same plane as the surface of the table. At this point the feed chain again takes up motion and carries the can-body along to the position for the next step in the seaming process beneath the next and last plunger. As soon as the can-body reaches this position it rests on a vertically movable plate. This plate raises the can-body and the quadrants engage it as described. Then the can-body and the can-head are forced downward through the quadrants from the larger diameter of the groove in the quadrants to the smaller diameter thus forcing by compression the folded rim of the can-head with the flared part of the can-body tightly against the side of the can-body. This operation may also be performed by the inward pressure of the quadrants as before described. It will be seen that this movement of can-bodies and can-heads through the machine will be continuous and that with every movement of the plungers each and every stage of the seaming operation will be performed.

I do not limit myself to the precise construction and arrangement herein described and shown in the drawings, as I desire to avail myself of such modification and equivalents as fall properly within the spirit of my invention.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a can heading machine, a table, parallel guides longitudinally arranged thereon

with a space between, a driving shaft, an endless feed chain intermittently operative in the plane with said table and having fingers forming pockets for can-bodies, means for intermittently operating said feed chain, means for feeding can-heads, a plurality of simultaneously vertically operative plungers above said table, means for operating said plungers in relation to the intermittent movement of said feed chain, said guides forming stops in the operation of said plungers, said plungers performing the seaming of the can-heads and can-bodies in successive stages, and means for discharging the can-bodies and can-heads from said plungers, substantially as described.

2. In a can heading machine, a table, parallel guides longitudinally arranged thereon with a space between, a driving shaft, an endless feed chain intermittently operative in the plane with said table and having fingers forming pockets for can-bodies, means for intermittently operating said feed chain, means for feeding can-heads, a plurality of simultaneously vertically operative plungers above said table, means for operating said plungers in relation to the intermittent movement of said feed chain, vertically movable plates in the face of said table below certain selected plungers, means for operating said plates, segmental opening and closing jaws in each of said plungers having angular faces, a rigid member in one of said plungers, adjustable members in the other plungers and all of such members having angular shoulders, said angular shoulders coinciding with said angular faces and means for operating said plungers, substantially as described.

3. In a can heading machine, a table, guides longitudinally arranged thereon with space between, a driving shaft, an endless feed chain operative in the plane with said table and having fingers forming pockets for can-bodies, said feed chain carrying the can-bodies in the space between said guides, means for intermittently operating said feed chain, means for intermittently holding said chain against movement, means for feeding can-heads, a plurality of simultaneously vertically operative plungers above said table, means for operating said plungers in relation to the intermittent operation of said feed chain, segmental opening and closing jaws having angular faces carried by each of said plungers, a rigid member carried by one of said plungers, adjustable annular members carried by the other plungers and all of said members having angular shoulders, said angular shoulders coinciding with said angular faces and means for operating said plunger members, substantially as described.

4. In a can heading machine, the combination with a table with guides thereon, of an endless can-body carrier operated with an intermittent movement in a plane with said table, a plurality of vertically movable plungers operative above said table, opening and closing segmental jaws in cavities in said plungers and provided with angular faces, means for operating said segmental jaws, members within said cavities provided with angular shoulders, said angular shoulders coinciding with the annular faces of said segmental jaws, means for operating said plungers, one of said plungers adapted to flare a part of a can-body and means for discharging the flared can-body from said plunger, substantially as described.

5. In a can heading machine, the combination with a table with guides thereon, of an endless can-body carrier operated with an intermittent movement in a plane with said table, a plurality of vertically moving plungers operative above said table, opening and closing segmental jaws in cavities in said plungers and provided with angular faces, means for operating said segmental jaws, members within said cavities provided with angular shoulders, said angular shoulders coinciding with the angular faces of said segmental jaws, means for operating said plungers, one of said plungers being adapted to flare a part of the can-body, means for discharging the flared can-body from said plunger, a feed chute for the can heads and means for placing the can heads on the flared can-bodies, substantially as described.

6. In a can heading machine, the combination with a table with guides thereon, of an endless can-body carrier operated with an intermittent movement in a plane with said table, a can-head feed chute, a plurality of vertically operated plungers above said table, opening and closing segmental jaws in cavities in said plungers and provided with angular faces, means for operating the said segmental jaws, members operative within said plungers provided with angular shoulders, said angular shoulders coinciding with the angular faces of the said segmental jaws, said member and said segmental jaws of the one member adapted to flare a part of the can-body, means for placing the can-heads in the flared can-bodies, said members and said segmental jaws of the other plungers adapted to seam together the flared portion of the can-body and the rim of the can-head, and means for discharging the can-bodies from the plungers, substantially as described.

7. In a can heading machine, the combination with a table with guides thereon of an endless can-body carrier operated with an intermittent movement in a plane with said table, a can-head feed chute, a plurality of vertically operated plungers above said

table, opening and closing segmental jaws in cavities in said plungers and provided with angular faces, means for operating said segmental jaws, members within said cavities provided with angular shoulders, said angular shoulders coinciding with the angular face of said segmental jaws, one of said plungers adapted to flare a part of the can-body, means coöperating therewith for discharging the flared can-body from said plunger, means for placing the can-heads on the flared can-bodies, one of the said plungers adapted to fold at an angle with the plane of the can-body an angular rim of the can-head under and against the flared part of the can-body, means coöperating with said plunger for discharging the can-head and can-body from the plunger, substantially as described.

8. In a can heading machine, the combination with a table with guides thereon of an endless can-body carrier operated with an intermittent movement in a plane with said table, a can-head feed chute, a plurality of vertically operated plungers above said table, opening and closing segmental jaws in cavities in said plungers and provided with angular faces, means for operating said segmental jaws, members within said cavities provided with angular shoulders, said angular shoulders coinciding with the angular face of said segmental jaws, one of said plungers adapted to flare a part of the can-body, means coöperating therewith for discharging the flared can-body from said plunger, means for placing the can-heads on the flared can-bodies, one of the said plungers being adapted to fold at an angle with the plane of the can-body an angular rim of the can-head under and against the flared part of the can-body, means coöperating with said plunger for discharging the can-head and the can-body from the plunger, one of said plungers adapted to fold at another angle with the plane of the can-body the folded annular ring of the can-head and the flared part of the can-body, and means coöperating therewith for discharging the can-head and the can-body from the plunger, substantially as described.

9. In a can heading machine, the combination with a table with guides thereon, of an endless can-body carrier operated with an intermittent movement in a plane with said table, a can-head feed chute, a plurality of vertically operated plungers above said table, opening and closing segmental jaws in cavities in said plunger and provided with angular faces, means for operating said segmental jaws, members within said cavities provided with angular shoulders, said angular shoulders coinciding with the angular face of said segmental jaws, one of said plungers adapted to flare a part of the can-body, means coöperating therewith for discharging the flared can-body from said plunger, means for placing can-heads on the flared can-bodies, one of the said plungers adapted to fold at an angle with the plane of the can-body an annular angular rim of the can-head under and against the flared part of the can-body, means coöperating with said plunger for discharging the can-head and the can-body from the plunger, one of said plungers adapted to fold at another angle with the plane of the can-body, the folded annular rim of the can-head and the flared part of the can-body, means coöperating therewith for discharging the can-head and the can-body from the plunger, one of said plungers adapted to fold tightly against the side of the can-body the folded rim of the can-head and the flared part of the can-body, means coöperating therewith for discharging the can-head and the can-body from the plunger, substantially as described.

10. The combination with a table and an intermittently moving can-body carrier, of a plurality of vertically operated plungers above said table, opening and closing segmental jaws in cavities in said plungers, annular angular projections on the inner walls of said cavities, angular projections on the outer surfaces of the segments of said jaws, a member within each of said cavities having an annular angular projection on its rim, angular projections on the inner surfaces of the segment of said jaws, said angular projections coinciding and forming cams, said segments being vertically movable in said cavities, and means for operating said segments, substantially as described.

11. The combination with a table and an intermittently moving can-body carrier, of a plurality of vertically operated plungers above said table, opening and closing segmental jaws in cavities in said plungers, annular angular projections in the inner walls of said cavities, angular projections on the outer surfaces of said segments, a member within each of said cavities having an annular projection on its rim, angular projections on the inner surfaces of said segments, said angular projections coinciding and forming cams, said segments being vertically movable in said cavities, and stops for forcing said segments inwardly into said cavities, substantially as described.

12. The combination with a table and an intermittently moving can-body carrier, of a plurality of vertically operated plungers above said table, opening and closing segmental jaws in cavities in said plungers, annular angular projections on the inner walls of said cavities, angular projections on the outer surfaces of said segments, a member within each of said cavities having an annular projection on its rim, angular projections on the inner surfaces of said seg-

ments, said angular surfaces coinciding and forming cams, said segments being vertically movable in said cavities, stops for forcing said segments inwardly into said cavities, vertically movable pins engaging said segments and compressible springs for returning said segments outwardly when pressure of the stops is removed, substantially as described.

13. The combination with a table and an intermittently moving can-body carrier of a plurality of vertically operated plungers above said table, opening and closing segmental jaws in cavities in said plungers, annular angular projections on the inner walls of said cavities, angular projections on the outer surfaces of said segments of jaws, a member within each of said cavities, a disk movably secured to the outer or lower surface of said member, compressible springs between said disk and said member, an annular angular projection on the rim of said member, angular projections on the inner surfaces of the said segments, said angular projections coinciding and forming cams, said segments being vertically movable in said cavities, and means for operating said segments, substantially as described.

14. The combination with a table and an intermittently movable can-body carrier, of a plurality of vertically operated plungers above said table, opening and closing segmental jaws in cavities in said plungers, annular angular projections on the inner walls of said cavities, angular projections on the outer surfaces of said segments of jaws, a member within each of said cavities, a disk movably secured to the outer or lower surface of said member, compressible springs between said disk and said member, an annular angular projection on the rim of said member, an angular projection on the inner surfaces of said segments, said angular projections coinciding and forming cams, said segments being vertically movable in said cavities, and stops for forcing said segments inwardly into said cavities, substantially as described.

15. The combination with a table and an intermittently moving can-body carrier, of a plurality of vertically operated plungers above said table, opening and closing segmental jaws in cavities in said plungers, annular angular projections on the inner walls of said cavities, angular projections on the outer surfaces of segments of said jaws, an annular member within each of said cavities, a disk movably secured to the outer or lower surface of said member, compressible springs between said disk and said member, an annular angular projection on the rim of said member, an annular projection on the inner surfaces of said segments, said angular projections coinciding and forming cams, said segments being vertically movable in said cavities, stops for forcing said segments inwardly into said cavities, vertically movable pins engaging said segments and compressible springs for returning said segments outwardly when pressure of the stops is removed, substantially as described.

16. The combination with a table of an intermittently moving can-body carrier, a plurality of vertically operated plungers having opening and closing segmental jaws, a can-head carrier, comprising a chute with a moving member, means for moving said member, an opening in said chute, spring pressed fingers for retaining can-heads over said opening, a plunger for driving said can-heads on the can-bodies, and means for operating said plunger, substantially as described.

In testimony whereof I have affixed my signature in the presence of two witnesses this 15th day of August 1908.

JAMES A. GRAY.

Witnesses:

FRANK L. OWEN,

A. M. TANNER.