

(No Model.)

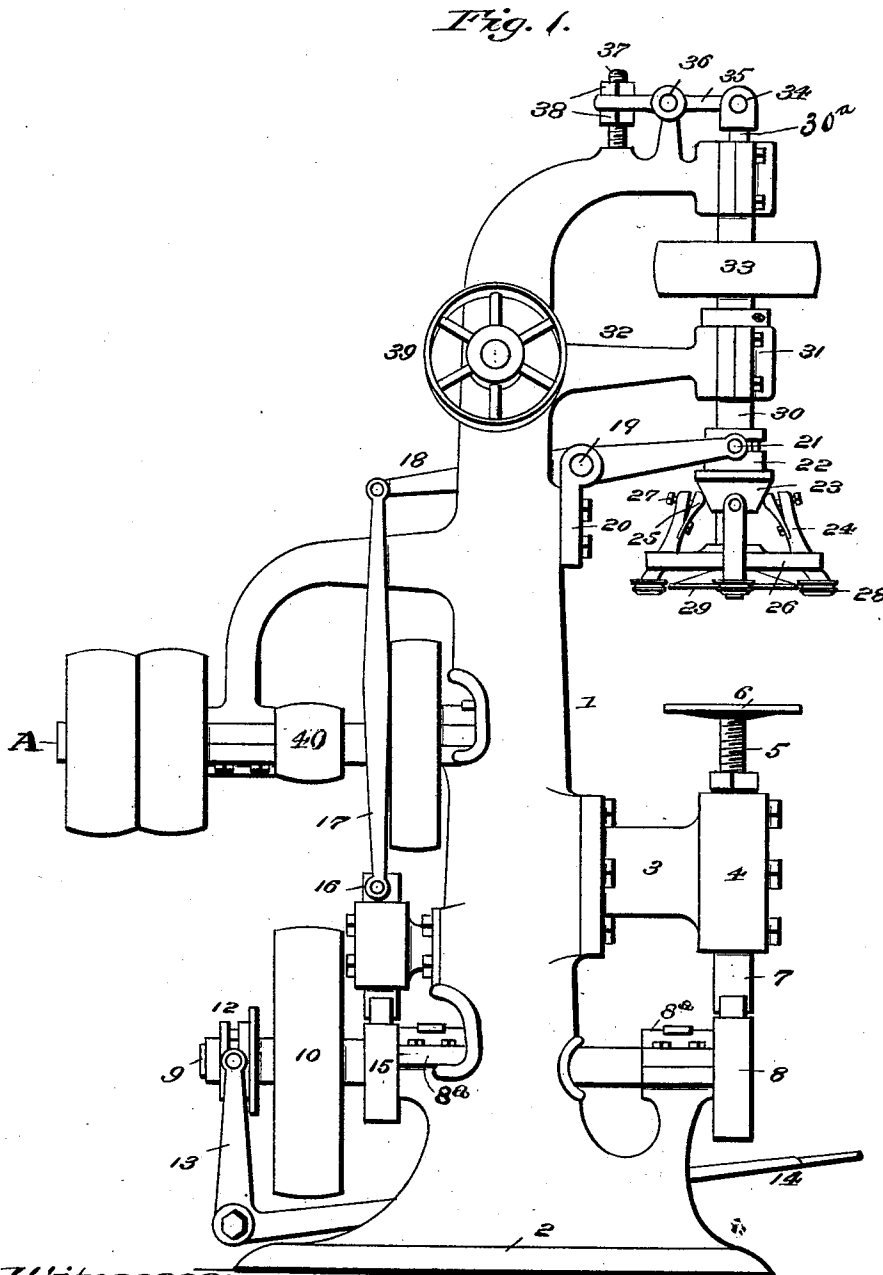
5 Sheets--Sheet 1.

J. A. STEWARD.

MECHANISM FOR SEAMING SHEET METAL CANS.

No. 519,594.

Patented May 8, 1894.



Witnesses:

Wm. C. Ashice
Ella M. Ballou

Ella M. Ballou.

Inventor:

John A. Steward

By
Jore C. Baker,
Atty.

Atté.

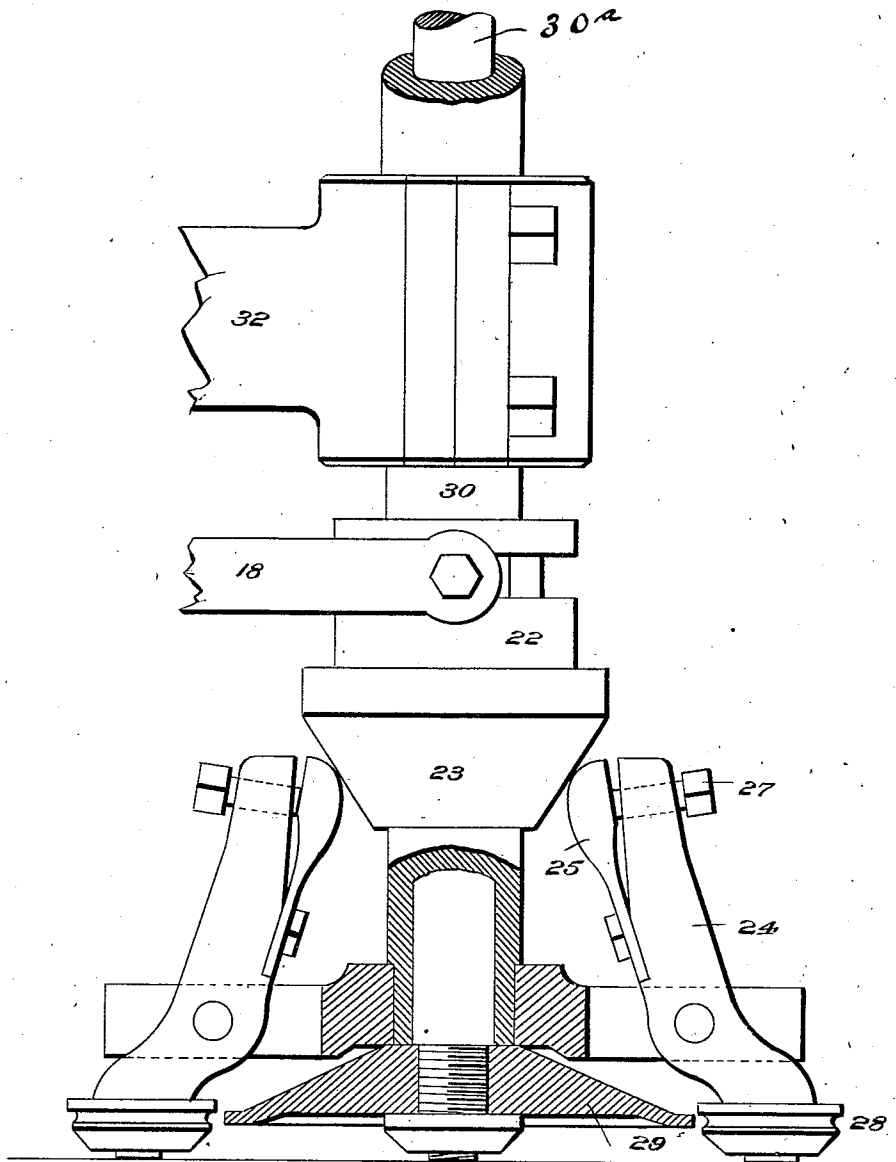
J. A. STEWARD.

MECHANISM FOR SEAMING SHEET METAL CANS.

No. 519,594.

Patented May 8, 1894.

Fig. 2.



Witnesses:

Wm. C. Ashlee
Ella M. Ballou

Inventor.

John A. Steward
By *Joel O. Baker*
Atty.

(No Model.)

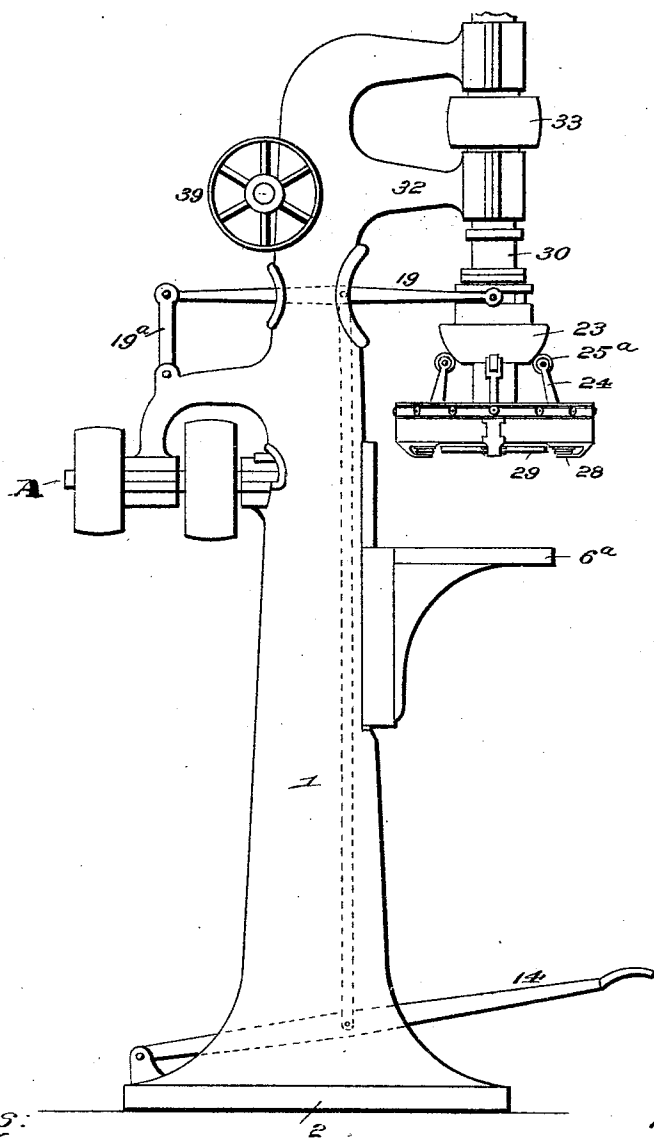
5 Sheets—Sheet 3.

J. A. STEWARD.
MECHANISM FOR SEAMING SHEET METAL CANS.

No. 519,594.

Patented May 8, 1894.

Fig. 3.



Witnesses:

John A. Steward
Ella M. Gallan

Inventor:

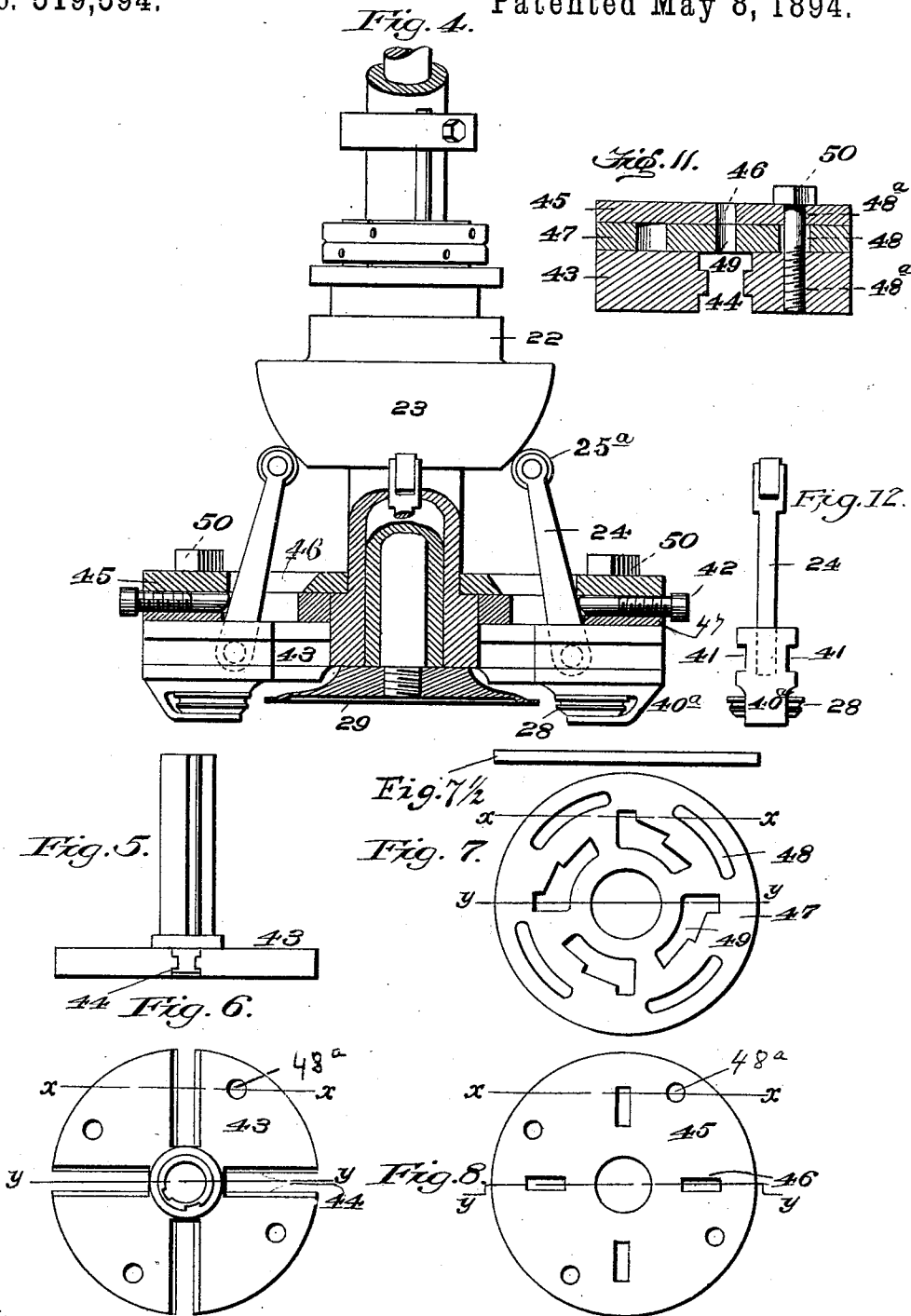
John A. Steward
By *Joe C. Baker*
Atty.

J. A. STEWARD.

MECHANISM FOR SEAMING SHEET METAL CANS.

No. 519,594.

Patented May 8, 1894.



Witnesses:

John A. Steward
John W. Ballou

Inventor

John A. Steward
By *Joel C. Baker*
Att'y.

(No Model.)

5 Sheets—Sheet 5.

J. A. STEWARD.

MECHANISM FOR SEAMING SHEET METAL CANS.

No. 519,594.

Patented May 8, 1894.

Fig. 9.

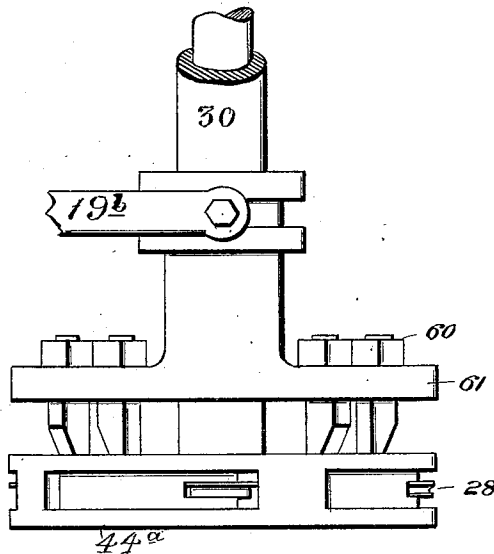
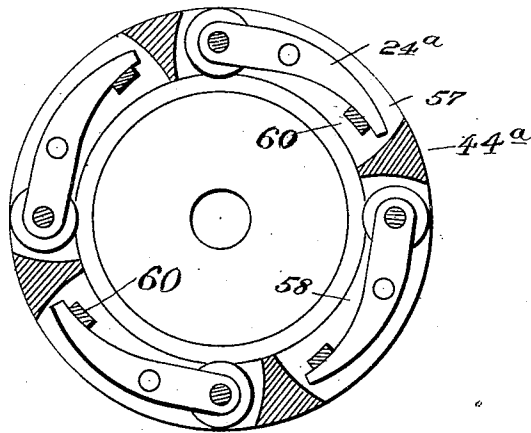


Fig. 10.



Witnesses:

Wm. C. Shill
Ella W. Ballou

Inventor.

John A. Steward
By *Joe C. Baker*
Att'y.

UNITED STATES PATENT OFFICE.

JOHN A. STEWARD, OF CLARENDON, VERMONT.

MECHANISM FOR SEAMING SHEET-METAL CANS.

SPECIFICATION forming part of Letters Patent No. 519,594, dated May 8, 1894.

Application filed August 8, 1892. Serial No. 442,500. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. STEWARD, a citizen of the United States, residing at Clarendon, in the county of Rutland and State of Vermont, have invented certain new and useful Improvements in Seaming Sheet-Metal Cans and other Vessels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to that type of mechanical apparatus used in seaming sheet metal vessels, such as cans for containing fruit and vegetables, paints, caustic alkalis and various substances, either fluids or solids, or a mixture of both.

It is the purpose of my invention to provide a novel mechanism of this kind, whereby the caps or covers of such vessels, or cans, may be double-seamed and hermetically sealed by a simple, speedy and uniform operation, requiring no special skill on the part of the operator, the mode of procedure being such as to permit the can to remain stationary during the seaming-operation, whereby the escape of any portion of the fluid contents, due to radial displacement under centrifugal force will be wholly avoided.

It is a further purpose of my invention to provide a seaming-mechanism in which the seaming-dies shall be capable of a fulcrum-adjustment, to adapt the apparatus to cans of different diameter; and my invention consists, to these ends, in the several novel features of construction and new combinations of parts hereinafter fully set forth, and then definitely pointed out in the claims annexed to this specification.

To enable others skilled in the art to understand and practice my said invention I will proceed to describe the same in detail, reference being had, for such purpose, to the accompanying drawings, in which—

Figure 1 is a side elevation of a mechanism embodying my said invention. Fig. 2 is a detail section, partly in elevation, showing the seaming-head upon a large scale; and Fig. 3 is a side elevation, showing a modified construction. Fig. 4 is a detail section, partly in elevation, showing a seaming-head, similar to that illustrated in Fig. 3, the scale being

enlarged and the figure being in two parts, the second part showing one of the seaming-dies, the die-carrier and lever. Fig. 5 is a detail view of the guide-disk for the seaming-dies. Fig. 6 is a detail plan view of the parts shown in Fig. 5. Fig. 7 is a plan view of the fulcrum-disk. Fig. 7½ is a side view of the part shown in Fig. 7. Fig. 8 is a plan view of the auxiliary guide-disk. Fig. 9 is a side elevation showing a slightly modified construction of the seaming-head; and Fig. 10 is a horizontal section of Fig. 9, taken in a plane just above the die-levers. Fig. 11, Sheet 4, is a segmental section on line *x* of Figs. 6, 7, and 8, showing the plates forming the seaming head held together by a screw. Fig. 12, shows the lever 24, separately.

The reference numeral 1 in said drawings indicates the frame of the machine, which rises from a base 2. Projecting from the front of this frame is a bracket 3 having a head 4, in which is arranged the spindle of the supporting-table, said spindle 5 being screw threaded to admit of vertical adjustment of the table 6. Beneath the head 4 the lower end of the spindle 5 projects below, and bears a cam edge or bearing head, 7, with which a cam 8, of any suitable form, has engagement, the purpose of this cam being to lift the table 6 after the can is set in place thereon, in order to bring its open end within the reach of the die-head. The cam is carried by a shaft 9 lying in bearings 8^a and projecting through to the rear of the machine-frame where it receives a pulley 10, belted in the manner hereinafter described, but loose upon the shaft, with which it is locked, when necessary, by a clutch 12, operated by bell-crank levers 13, having a treadle 14.

At the upper part of the machine-frame, which is curved over toward the front, a bracket-arm 32 is provided having a box at its end, lying beneath a similar box at the end of the curved top of the machine frame. In these boxes a vertical shaft 30 has bearings, and upon the lower end of this shaft, which is tubular in form, is mounted a cone, or conical-frustum 23, having a cylindrical head 22, which is provided with a circular channel 21, which receives the pins upon the forked end of a lever 18, by which the cone is moved up and down. The rearward end of

the lever 18 is connected by a link 17 to a cam-head 16, mounted upon a stud projecting from the rear of the frame, this cam-head being operated by any suitable form of cam 15, carried by the shaft 9.

Within the tubular shaft 30 is arranged a spindle 30^a, upon which is rigidly mounted the seaming-head 29. This head consists of a disk of metal, or any suitable material, having a diameter equal to that of the cam, this disk being gradually dressed off upon its upper surface from a thickened center, where it unites with the spindle, to a thin or sharp periphery. Immediately above this disk 29 is mounted the support for the die-levers, which consists of a disk or, if preferred, a spider, having slots cut radially therein, in which are fulcrumed the die-levers 24. Upon the lower ends of these levers are mounted the seaming-dies 28, each consisting of a roller of suitable diameter having a circumferential channel of a width which will receive the edge of the seaming-head 29, the lower face of the seaming-dies being beveled off beneath the lower flange inclosing said channel. The die-levers project above their fulcrums and incline inward, toward the shaft, their ends being in the plane of the conical frustum 23. Upon the inner edges of these levers are mounted adjustable fingers 25, bolted to the levers at the lower end and having support against the ends of bolts 27, which are tapped through the upper end of the levers and by turning which the contact-points of said fingers may be thrown inward toward the conical face, or allowed to spring outward and removed therefrom, this movement giving a closer and more forcible engagement between the roller-dies 28 and the edge of the seaming-head 29. The tubular shaft 30 with its conical frustum 23 is normally raised to release the die-levers by the weight of its link-connection 17, and cam-head 16, and is thrown down to bring the roller-dies into operative engagement by the operation of the lever 13, which, also, lifts the table 6, supporting the cam, the two movements being substantially simultaneous. The spindle carrying the die-head 29 is held rigidly by an adjusting lever 35, pivotally connected to the upper end of the spindle and mounted on a fulcrum 36, its other end lying between nuts 38 turned upon a short vertical stud 37, upon the upper end of the frame. By adjusting these nuts a limited vertical adjustment may be given to the spindle, and this adjustment in conjunction with that of the table 6 enables the machines to be used in seaming cans of different sizes and different heights, as the seaming-head 29 is interchangeable for heads of different sizes, as shown in Fig. 2. The spindle carrying the die-head 29 being rigid, the seaming-dies are arranged to rotate about the head by revolution imparted to the female shaft 30. This shaft is provided with a pulley 33 which is belted to a pulley upon the power-shaft A, the belt running over a guide-pulley 39. The

power-shaft is provided with a tight and a loose pulley, connected by a belt with the driving-mechanism, and also has a small pulley 40, which is belted to the loose pulley 10 upon the shaft 9, a continuous revolution being thereby given to the seaming-dies.

In seaming small cans, or in work involving a seaming-head of one size only as to height, with such variations in diameter of the can as may ordinarily occur, I employ the mechanism shown in Fig. 3, which is constructed and operated on substantially like principles. In this modification, however, I dispense with the vertically adjustable table, and substitute therefor an angular bracket 6^a, which has a tongue and groove connection with the frame 1, upon which it is vertically adjustable, when necessary, but not raised and lowered to present each can to the seaming-dies. The spindle and the tubular shaft carrying the seaming-head are the same as already described, except that the spindle is not vertically adjustable, but is fixed in the bracket 32 and in the upper curved end of the frame by step bearings, not shown. The tubular shaft is revolved by a pulley 33, belted to a pulley on the power-shaft A and supported by an intermediate guide-pulley 39, in the manner already described, the power-shaft being provided with a single fast pulley and having continuous rotation. The seaming-dies 28 are substantially similar to those in Fig. 2, but are journaled upon vertical axes in blocks, or carriers 40^a. These blocks are provided with opposite horizontal channels 41, which receive tongues 44, formed upon the opposite faces of radial grooves in a guide-disk 43, mounted upon the lower end of the tubular shaft, whereby the carriers 40^a may have radial adjustment and may also have the necessary radial movement to enable them to properly engage with the edge of the seaming-head 29. The carriers 40^a are operated by die-levers 24 pivotally connected to the carrier as shown in Fig. 4, and rising above the same until their free ends are substantially in the horizontal plane of the conical frustum 23. The fulcrum of each lever consists of a series of shoulders formed in the outer edges of short, substantially concentric slots 49 in a fulcrum-disk 47. This disk lies between the die-blocks and an upper guide-disk 45, having slots 46, through which the levers pass. The three plates 43, 45, and 47, are held as shown in Fig. 11, securely together in use, by screw 50, in holes 48^a in plates 43 and 45, and slot 48 in plate 47, to admit of its rotary adjustment. This fulcrum-disk 47 is provided with short concentric slots 48, by which its rotary adjustment is limited to the length of the shouldered slots 49, to enable any one of the shoulders in said slot which lie at different radial distances from the axial center to be brought behind or outside of the die-lever 24, and thereby shift the fulcrums of said levers inward and outward. The purpose of this adjustment will be readily ap-

parent, as it enables the dies to act upon cans of any diameter within the limits of the fulcrum-adjustment, the seaming-head 29 being interchangeable to correspond with each adjustment. The conical frustum 23 is raised and lowered to release and operate the die-levers by means of a lever 19 extending from the forked end, which engages the channeled head of the frustum, to a point in rear of the frame 1, where its end is connected by a link 19^a to a curved arm in rear of the frame which forms part of the support of the power-shaft. This lever is operated by a foot-lever 14, which is connected by a link, shown in dotted lines in Fig. 3, to a point upon said lever 19, between its ends. The ends of the lever-arms 24 are provided with friction-rolls 25^a, which ride upon the surface of the conical frustum to prevent the parts from binding and reduce their wear. This construction involves but few parts, is capable of a wide range of adjustment and operates with great speed, certainty and efficiency. The levers 24 turn on pivots to move the seaming dies inward or outward to fit the can. To move them inward during the progress of the work the upper ends of the levers are forced apart by a wedge shaped cone 23, moving vertically. The levers are set vertically as shown in Figs. 1 to 4, but may be set differently as in Figs. 9 and 10, where the wedge element is changed to fit the new arrangement, as in a number of wedges 60. As shown in Figs. 1 and 2 the levers 24, have permanently fixed pivots, but, where desired, they are adjustably fixed, as in Figs. 3 and 4, where the head is formed of a number of plates 43, 45, and 47 superposed, with slots for the levers. The central plate has slots 48 which allow it to be turned around some distance while held by bolts holding all together, passing through holes 48^a in the other plates, and which by tightening hold the central plate at any point at which it is set. The central plate 47, also has slots 49 for the levers 24, to play in; and the outer sides of these slots have step like forms extending outward to different distances so that when the plate is turned to different points the levers will be held with fulcrums at different distances from the center, for different sized cans. Besides this means of adjustment screws 42 are shown in Fig. 4, set into the edges of the central plate 47, with their inner ends against the levers, by which the levers may, when required, be adjusted to closer degrees.

I propose, in certain cases, to substitute for the construction shown in Figs. 2 and 4, the arrangement of dies and die-levers seen in Figs. 9 and 10. In this construction the seaming-dies are not substantially different from those already described, but their vertical axes are carried by die-levers having vertical fulcrums and vibrating in a horizontal plane. The fulcrum-points of these levers and the levers themselves are arranged in substantially quadrantal slots, formed in a

ring 44^a, which is mounted upon the lower end of the tubular shaft 30, which, as well as the spindle inclosed by said shaft, does not differ from the construction already described. The power-ends of these die-levers lie wholly within the slots, and are operated by vertical wedge-shaped fingers 60, arranged within a ring-support 61, which forms part of the tubular shaft and in which said fingers are vertically adjustable. Their outer edges are beveled off in such manner that, by depressing or lowering said fingers, the beveled faces will bear against the inner ends or inner edges of the power-ends of the die-levers, as seen in the sectional view, Fig. 10, thereby throwing the seaming-dies into engagement with the seaming-head. These fingers and the support in which they are mounted, are thrown downward to bring the dies into engagement by means of a lever 19^b, having a forked end provided with pins which run in a circular channel in the sleeve which constitutes a part of the support 61. I regard this modification as substantially within the scope of my invention, as previously described. It will be noted, however, that the construction is such that there is no capacity for the variable adjustments which are provided in Figs. 2 and 4, by which the mechanism is enabled to operate upon cans of different diameters and for this reason the seaming-head 29 need not be interchangeable.

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

1. The combination, with a rigid support for the can, of a vertically-movable but otherwise rigid seaming-head, interchangeable upon a supporting spindle, a series of seaming-dies journaled in radially adjustable supports, a series of die-levers, means for varying the throw of said levers to correspond to variations in the diameter of the interchangeable head, and a conical frustum revolving with and vertically adjustable between the free ends of said levers, substantially as specified.

2. The combination, with a rigid seaming-head of a series of roller-dies mounted in supports which are radially movable toward and from the periphery of the seaming-head, a series of die-levers pivotally connected to said supports, a conical frustum vertically adjustable within the free ends of said levers, a fulcrum-disk having a series of concentric slots provided upon their outer margins with shoulders located at different radial distances from the center, through which slots the levers pass, and provided with slots limiting the rotary adjustment of the fulcrum-disk, and means for operating the conical frustum and revolving the support for the seaming-dies, substantially as specified.

3. The combination, with a rigid or non-revoluble support for the can, of a non-revoluble seaming-head, a series of seaming-dies, a revoluble support, a series of die-levers ad-

justably fulcrumed in said support, a conical frustum operating said levers, a cam-shaft driven from the power-shaft, and cams simultaneously operated by said cam-shaft to raise the can-support and depress the conical frustum, substantially as specified.

4. In a mechanism for seaming sheet metal cans, the combination of a seaming head arranged to be held stationary in use with a series of seaming dies borne on adjusting levers provided with adjustable fulcrums, and wedge mechanism to move them when in use.

5. The combination of the seaming head 29, arranged to be held stationary in use with a

series of seaming dies 28, borne on adjusting levers 24, provided with alternative bearings, 49, adapted to act as fulcrums for adjustment to cans of different sizes, and wedge mechanism formed of the conical frustum 23 having vertical motion to move the levers and dies in use.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN A. STEWARD.

Witnesses:

ELLA M. BALLOU,
ELBRIDGE M. BUCK.