

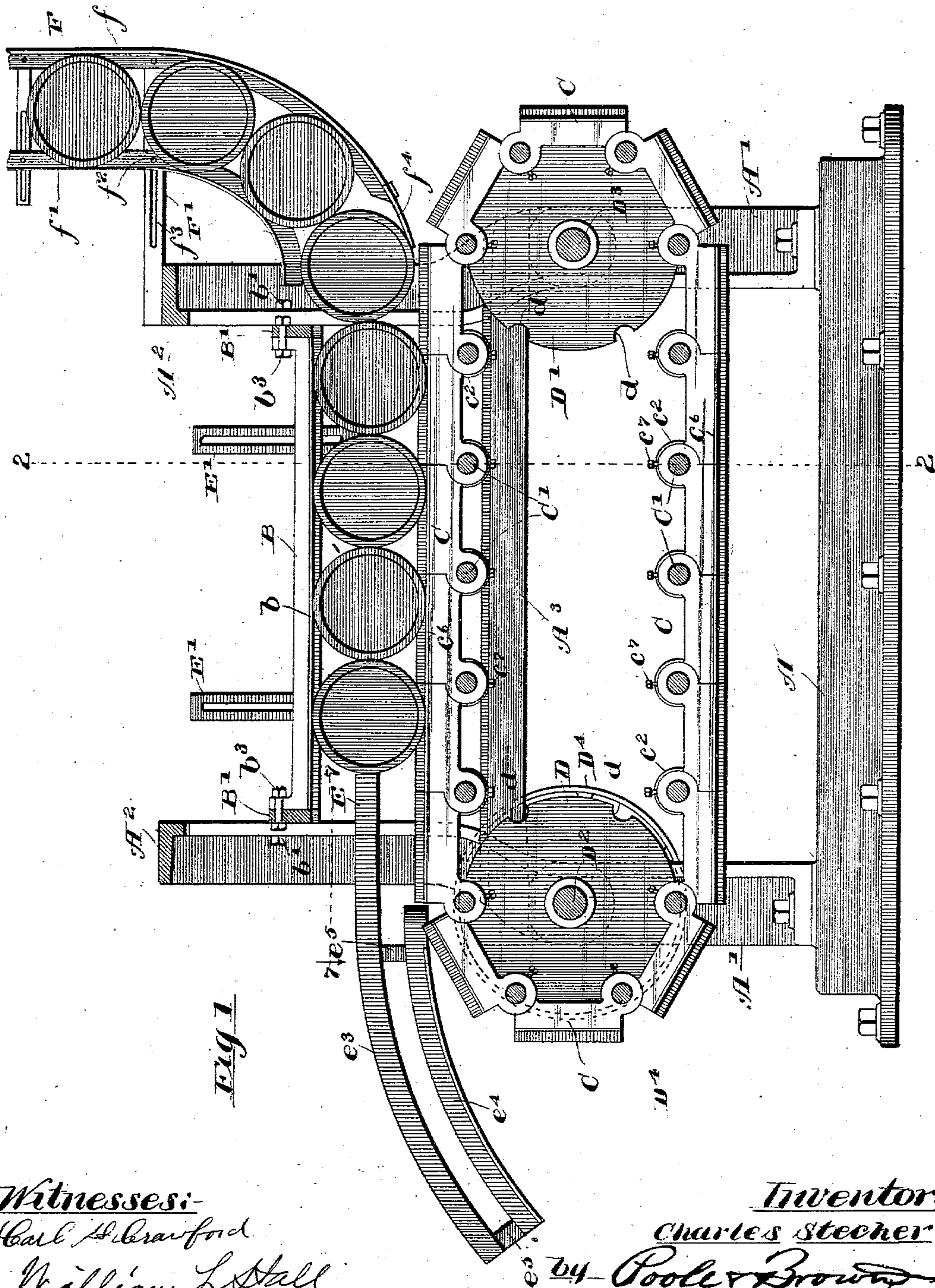
C. STECHER.

MACHINE FOR FASTENING THE HEADS OF CANS TO THE BODIES THEREOF.

APPLICATION FILED APR. 25, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:

Carl H. Crawford

William L. Hall

Inventor:

Charles Stecher

by Poole & Brown
his Attorneys

No. 740,199.

PATENTED SEPT. 29, 1903.

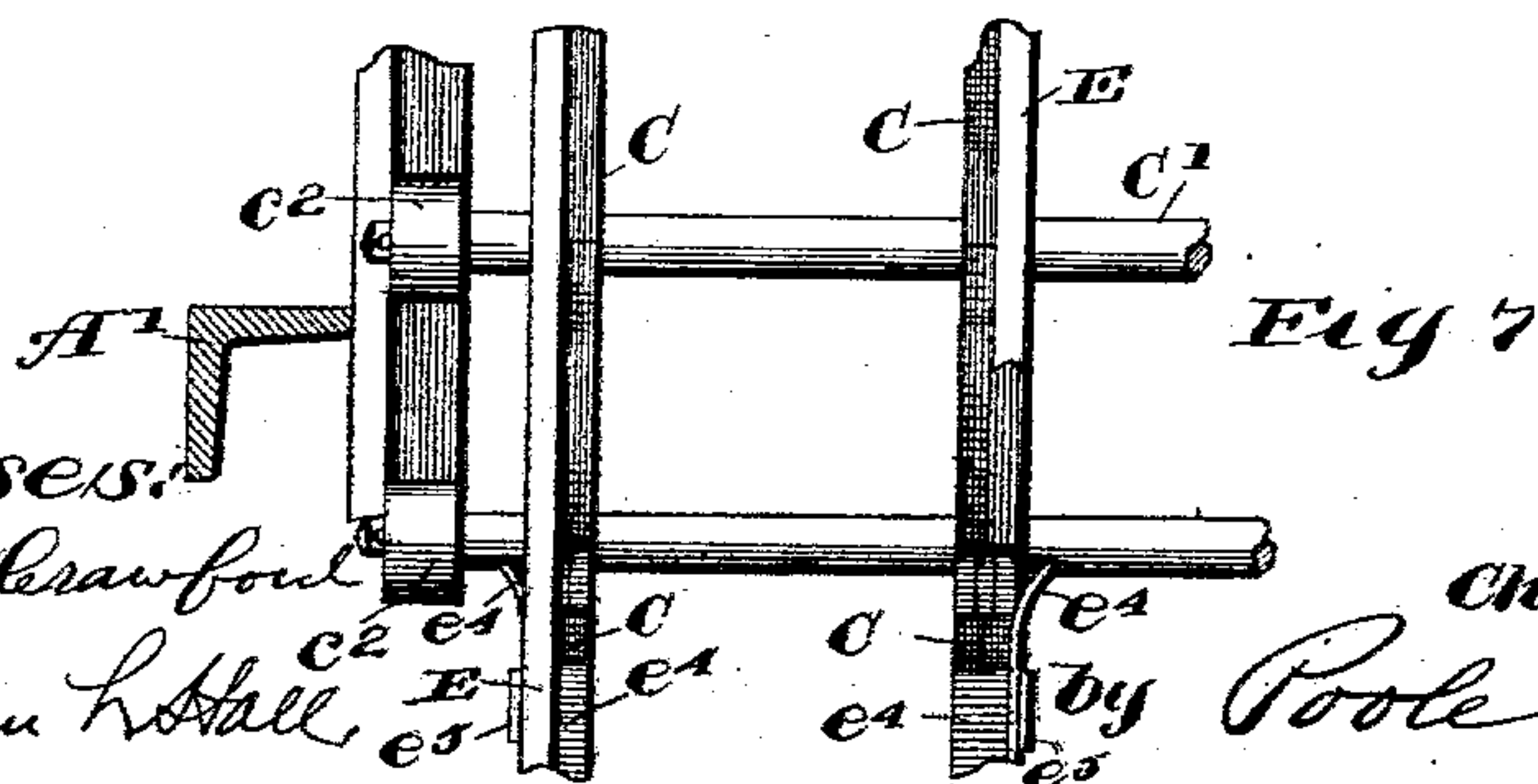
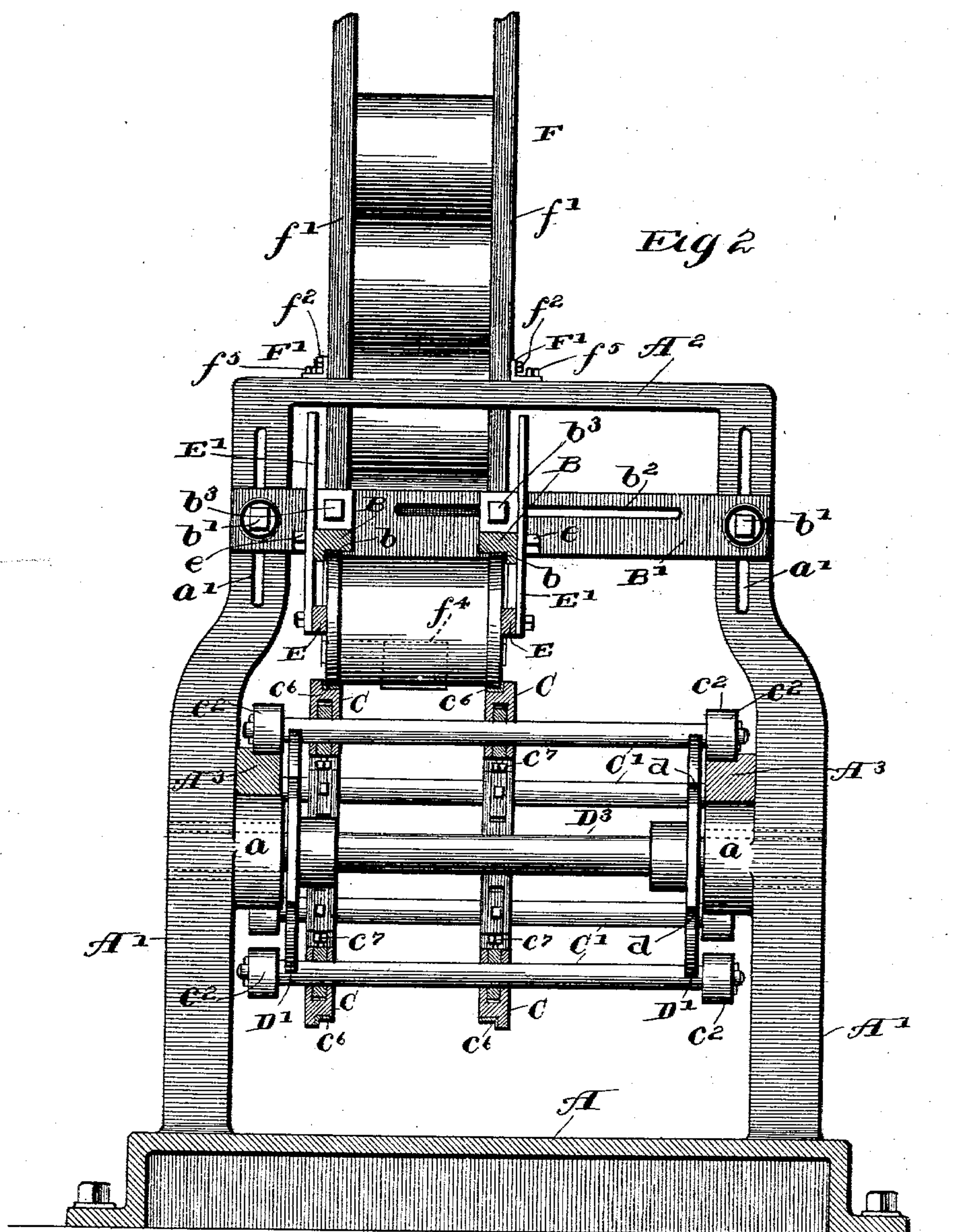
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3 SHEETS—SHEET 3.

Fig 3

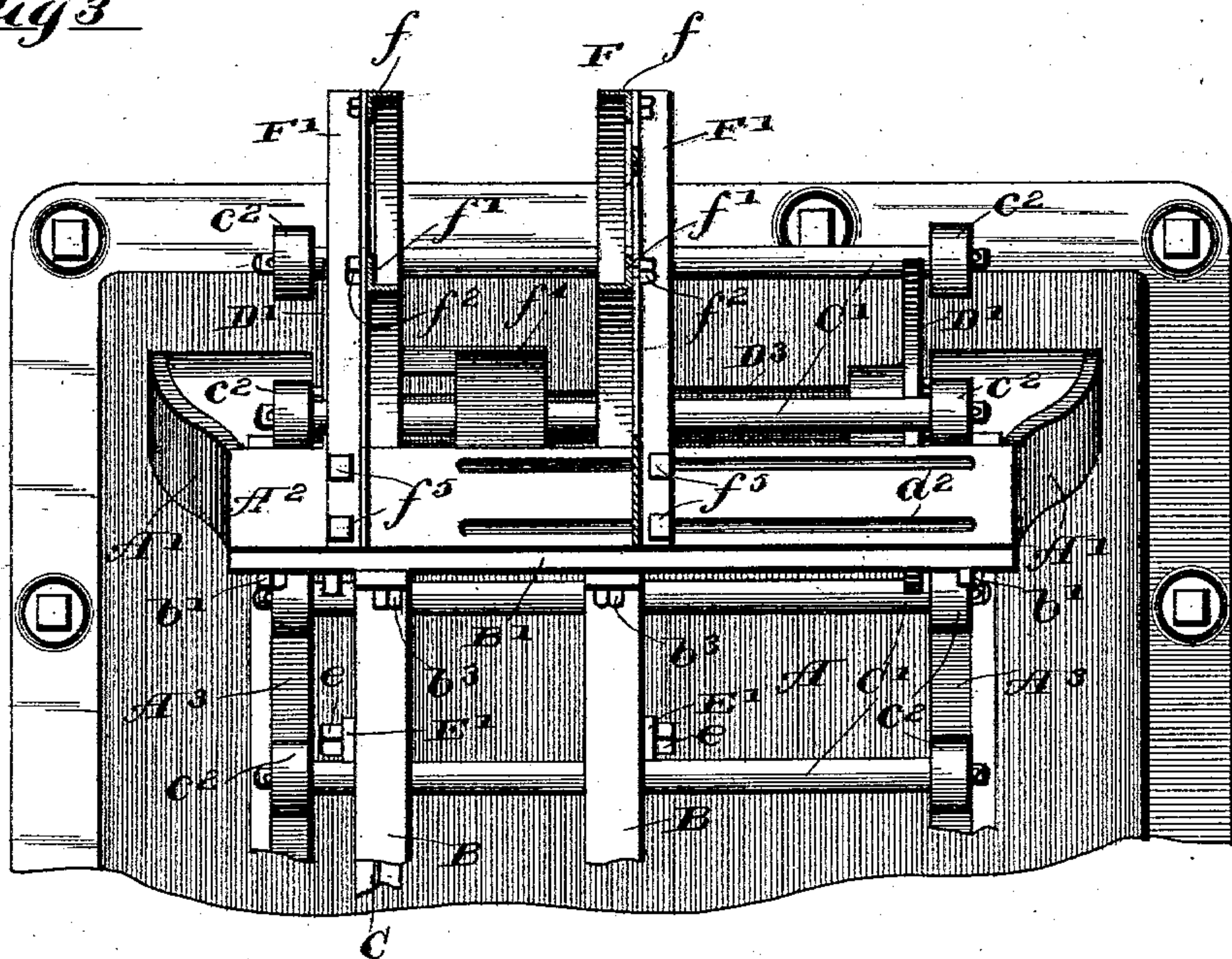


Fig 5

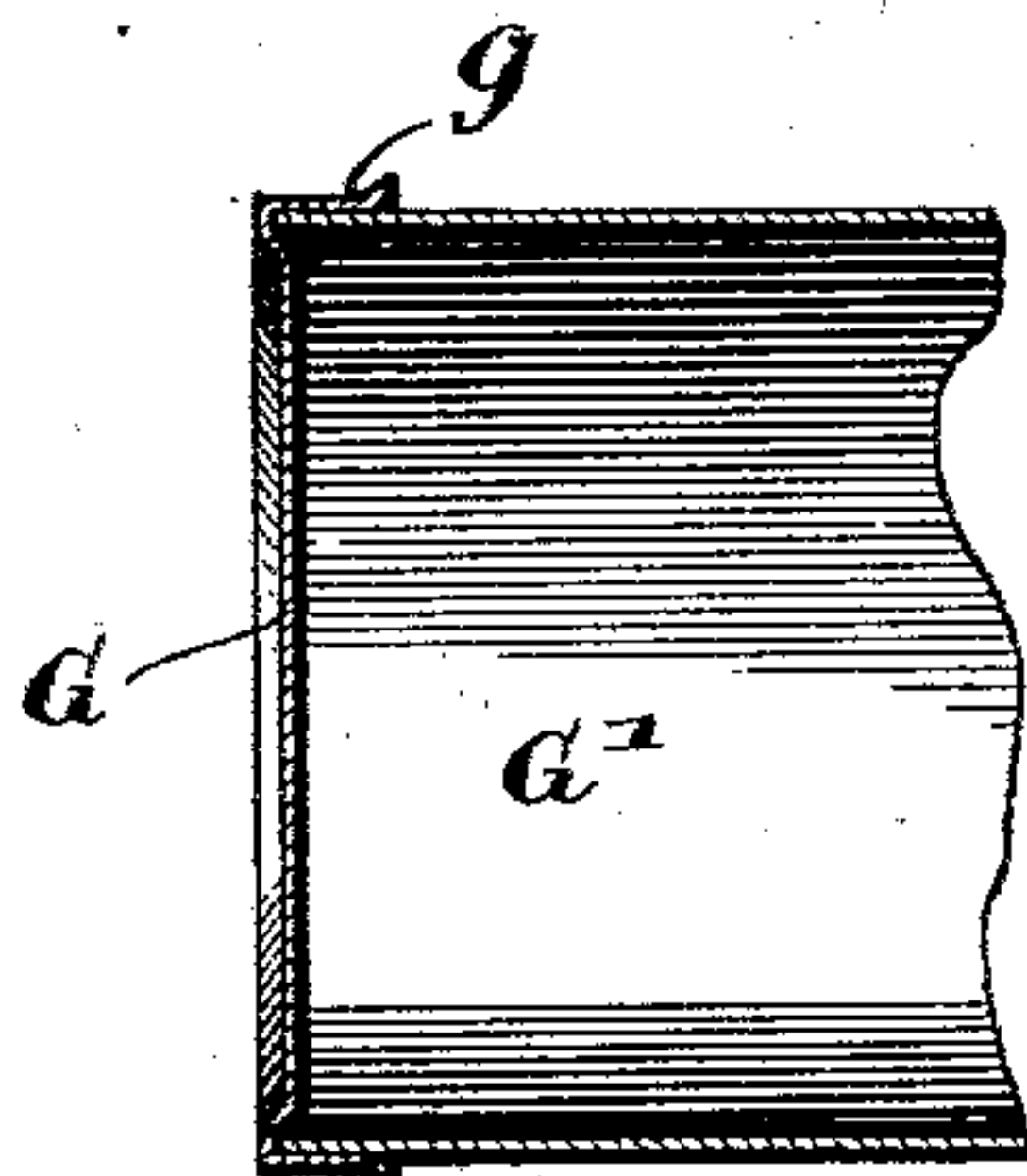


Fig 6

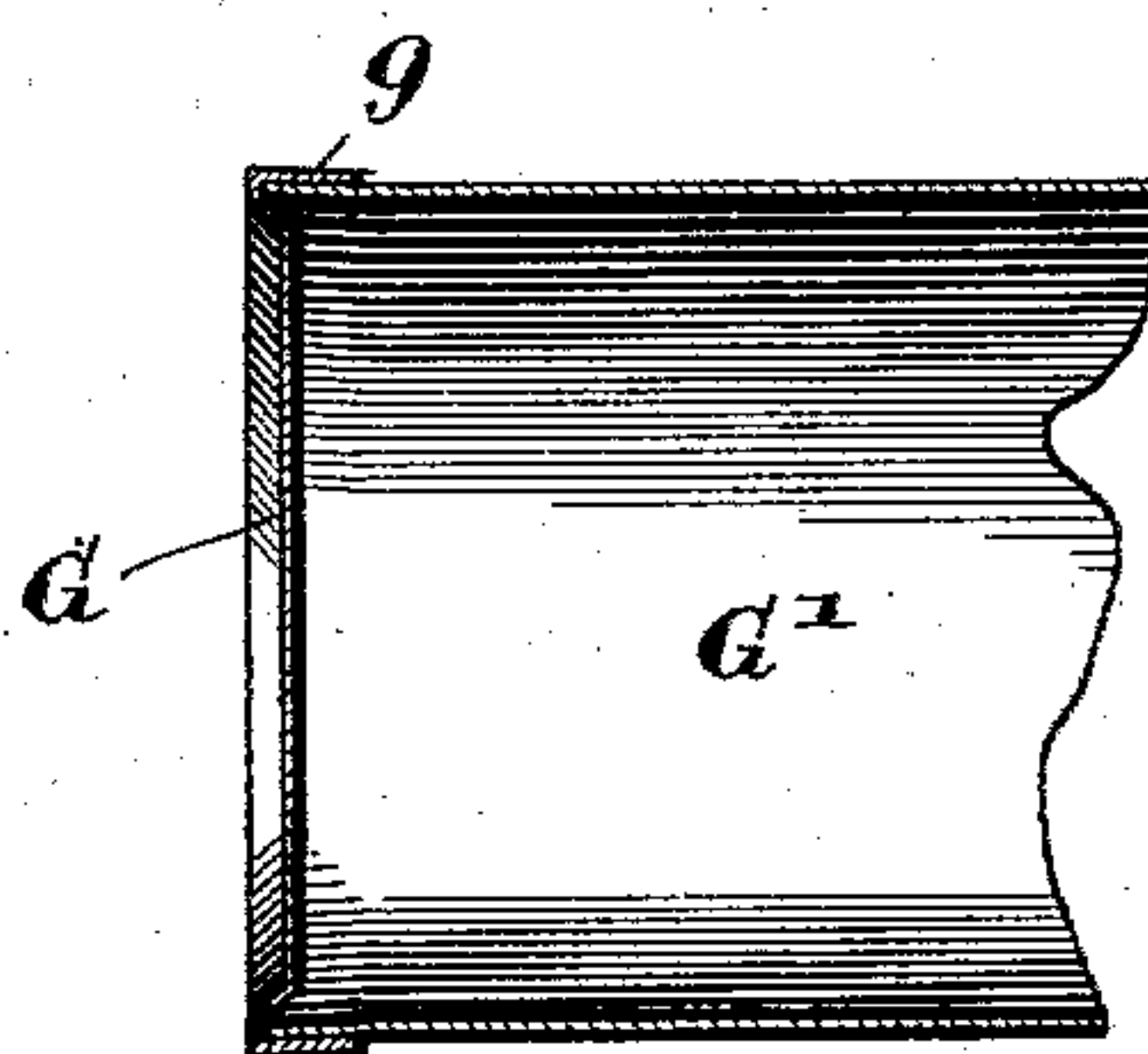
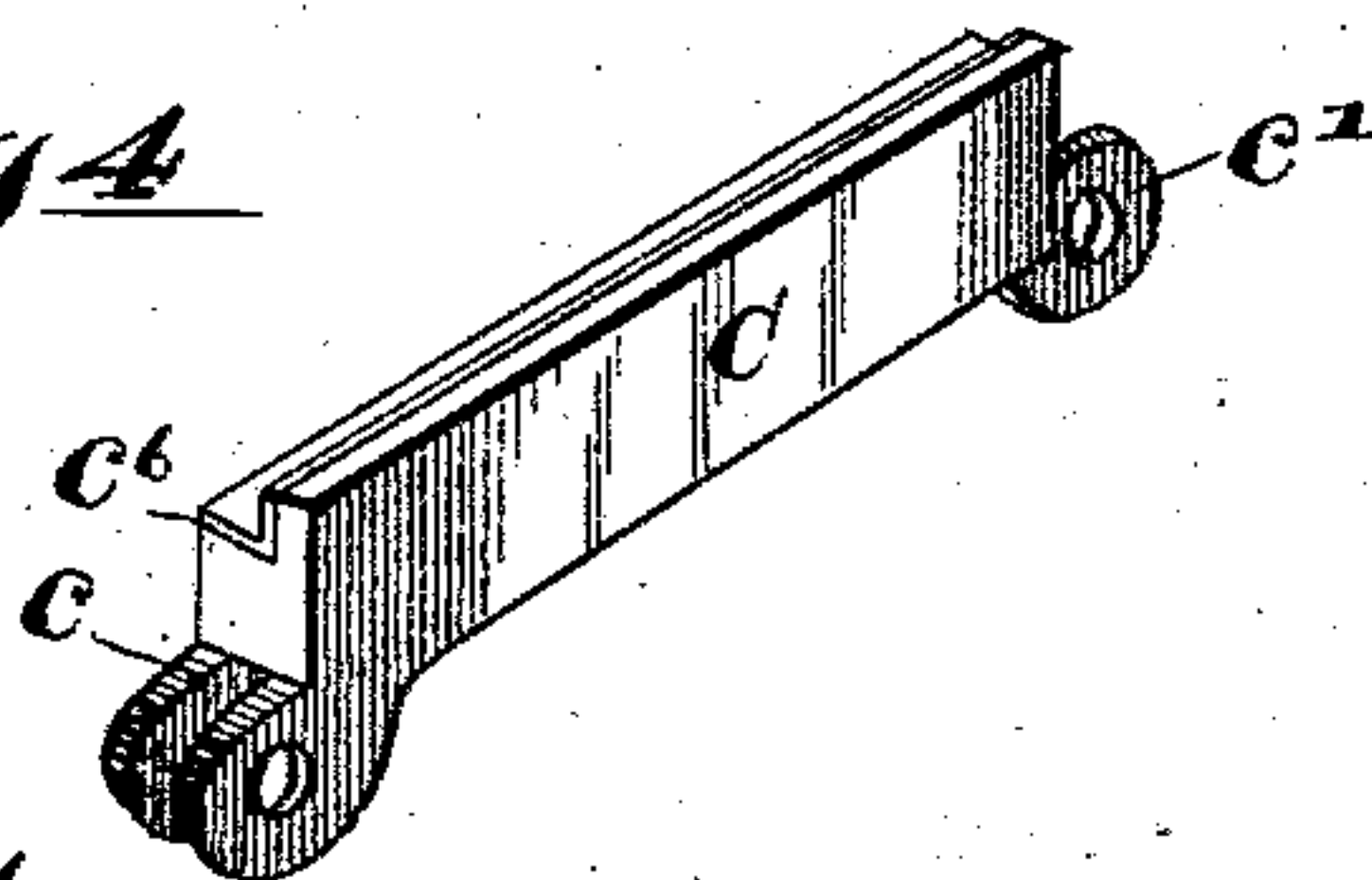


Fig 4



Witnesses:-

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UNITED STATES PATENT OFFICE.

CHARLES STECHER, OF POINT EDWARD, CANADA, ASSIGNOR OF TWO-THIRDS TO PETER FULFORD, OF NORTH PORT HURON, MICHIGAN, AND WILLIAM S. CUMMING, OF CHICAGO, ILLINOIS.

MACHINE FOR FASTENING THE HEADS OF CANS TO THE BODIES THEREOF.

SPECIFICATION forming part of Letters Patent No. 740,199, dated September 29, 1903.

Application filed April 25, 1902. Serial No. 104,586. (No model.)

To all whom it may concern:

Be it known that I, CHARLES STECHER, of Point Edward, in the Province of Ontario and Dominion of Canada, have invented certain
5 new and useful Improvements in Machines for Fastening the Heads of Cans to the Bodies Thereof; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accom-
10 panying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in machines for crimping or otherwise fastening
15 the heads or caps of cylindric sheet-metal cans and like vessels to the bodies thereof; and the invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

20 A machine embodying my invention embraces, in general terms, two opposing dies or two sets of opposing dies for operating on one or both ends of the cans, one or both of the said dies or sets of dies being at least as
25 long as the circumference of the largest can to be operated upon, so that each can as it passes through the machine will be given one entire rotation, thereby bringing all parts of the flange of the cap into rolling contact with
30 the crimping-dies. The machine illustrated embodies elongated stationary dies and a series of connected movable dies, which move in a plane parallel with the plane of the stationary dies and between which and the sta-
35 tionary dies the flanges of the heads or caps of the cans are crimped to fasten the same to the bodies of the cans. The movable dies are connected together in the form of two endless chains, which are trained around suit-
40 able driving-wheels, and said chains at one side thereof travel in straight lines parallel with the opposing stationary dies. The travel of the movable dies acts to rotate the cans or sheet-metal vessels and carry the same for-
45 wardly through the machine. Said machine is provided with a delivery-chute, into which the cans are fed and by which they are delivered to the space between the stationary and movable dies, and with a discharge-chute,
50 which directs the cans away from said dies.

I have shown in the drawings one form of machine embodying my invention; but it will be understood that the structural details may be widely varied without departing from the spirit of the invention and that the main fea-
55 tures of the improvements herein described may be embodied in machines for effecting other work on cans and like sheet-metal ves- sels—such, for instance, as double-seaming the can heads or caps to the can-bodies. 60
Such an application of the invention is shown in my copending application, filed on the 9th day of May, 1902, Serial No. 106,539.

In said drawings, Figure 1 is a longitudinal vertical section of a crimping-machine em- 65
bodying my invention. Fig. 2 is a transverse vertical section thereof, taken on line 2 2 of Fig. 1. Fig. 3 is a top plan view of the receiving end of the machine with the de-
livery-chute shown in section. Fig. 4 is a 70 perspective view of one of the movable dies separated from the others of its series. Fig. 5 is a longitudinal section of one end of the sheet-metal can to which the head or cap is applied and before the flange thereof has
75 been crimped upon the body. Fig. 6 is a similar view of the can after the crimping has been effected. Fig. 7 is a fragmentary section on line 7 7 of Fig. 1.

As shown in said drawings, A designates 80
the rectangular base of the machine, and A' A' vertical side standards at the ends of the machine rising one from each corner of said base. Said standards are connected at their upper ends by integral connecting-bars A². 85

B B designate two parallel horizontal upper die-bars, which are attached at their ends by bolts b³ to front and rear horizontal bars B' B', which extend transversely between and are attached at their outer ends to the up- 90
right standards A' A' by bolts b'.

C C designate a plurality of lower connect-
ed movable dies which have the form of short links and are connected together at their ends to form two endless chains, one located 95
beneath each die-bar B. The series of dies C on each side of the machine are connected together by link-bars C', the individual dies being pivoted to said link-bars, so as to flexi-
bly connect the dies in the manner of the 100

links of a chain. For this purpose each die link or section is provided at one end with a notch *c*, as shown in Fig. 4, and at its other end with a reduced portion *c'*, adapted to enter the notch of an adjacent die link or section, and said notched and reduced parts of the links are provided with apertures through which the link-bars *C'* extend when said dies are assembled in overlapping relation.

10 The working faces of the upper and lower dies *B* and *C* are made of the same shape in cross-section. Said dies are each provided on its working face with a longitudinal depression or rabbet having vertical surfaces
15 which engage the heads or caps of the cans, and with generally horizontal surfaces which engage the flanges of the can-heads and the can-bodies. Said last-mentioned surfaces are not, however, exactly horizontal, but are made
20 deeper at their outer parts, or the parts near the vertical surfaces, than at their inner parts, as clearly shown in Fig. 2, whereby they are inclined slightly upwardly and inwardly, so as to give a corresponding inward inclination
25 to the flanges of the heads, as shown in Fig. 6. The working faces of said dies preferably consist of separate steel facings *b c*⁶, which are attached to the bodies of the dies in any suitable manner.

30 The two series or chains of connected movable dies are given movement by being trained over front and rear sprocket-wheels *D D'*, which are affixed to rotative shafts *D² D³*, which are rotatively mounted in the standards *A'*, as most clearly shown in Fig. 2.
35 Said sprocket-wheels are provided with peripheral notches *d*, which are engaged by the link-bars *C'* outside of the dies *C* and by which positive movement is transmitted from
40 the sprocket-wheels to the series of connected dies. The series of dies are driven through the medium of a belt wheel or pulley *D⁴* on the forward shaft *D²*, as shown in Fig. 1. The upper laps of the connected dies travel
45 in paths parallel with the upper die-bars *B*, and said upper laps are supported by means of parallel horizontal longitudinal bars *A³*, which are supported at their ends on inwardly-projecting parts or bosses *a* on the
50 standards through which extend the shafts *D² D³*, as most clearly shown in Fig. 2. Said link-bars are preferably provided at their ends with antifriction-rollers *c²*, which roll on said bars *A³*, thereby reducing the friction
55 between said parts. Desirably, also, the supporting-bars *A³* are provided with longitudinal depressions in which said rollers *c²* travel, which prevents endwise shifting of the link-bars, thereby preventing the lower series of
60 dies *C* getting out of alinement with the upper dies.

65 *E E* designate horizontal parallel guide-bars, which are located between the upper and lower dies and adapted to engage the ends of the cans as they pass between said dies and prevent said cans from shifting endwise. Said guide-bars are attached to the

lower ends of vertical bars *E' E'*, which latter are attached to the horizontal die-bars *B* by means of set-screws *e* extending through
70 said bars and into the die-bars *B*. The guide-bars *E* are adapted to be vertically adjusted for cans of different diameters, and for this purpose the bars *E'* are provided with slots through which the set-screws *e* extend,
75 whereby said dies may be moved upwardly or downwardly to correspond with the diameters of the cans passing through the machine.

The upper and lower dies *B* and *C* are movable toward and away from each other to accommodate cans of different diameters and
80 also adjustable for accommodating cans of different lengths. For the purpose of adjusting the dies for cans of varying diameters the upper die-bars *B* are mounted in the machine-frame so as to be moved toward and
85 away from the lower series of dies. The means herein shown for effecting this result consists in providing the standards *A'* with vertical slots *a'*, through which extend the
90 bolts *b'*, which attach the transverse die-supporting bars *B'* to said standards. For the purpose of adjusting the dies to cans of different lengths one of the upper dies *B*—that
95 at the right-hand side of the machine, as herein shown—is movable toward and from the other die, and this result is effected by providing the die-supporting members *B'* with longitudinal slots *b²*, through which extend the attaching-bolts *b³*, by which said
100 die-bar is connected with said transverse frame members. The corresponding series of die-links *C* are also movable laterally on the link-bars *C'*, and for this purpose the links are attached to said link-bars by set-screws *c⁷* in the manner shown in Fig. 2,
105 which permits said die-links to be moved inwardly and outwardly, as desired.

The cans are fed to the machines through a delivery-chute, (indicated as a whole by *F*),
110 which is suitably supported on the delivery end of the machine. Said chute is rectangular in cross-section and consists of four angle-bars *f f' f'' f'''*, located one at each corner of the chute, the flanges of which are directed
115 toward each other to engage the ends and sides of the can in the manner shown in said Fig. 3. Said chute-bars are attached by means of bolts *f²* to horizontal arms *F'*, which extend rearwardly from the rear cross-bar *A²*
120 of the machine-frame in the manner shown in Fig. 3 and attached thereto by means of bolts *f⁵*. The rear bars *f* of said chute are fixed stationary to said arms *F'*, while the front bars *f'* are movably fixed to said arms,
125 whereby the chute may be adjusted for cans of varying diameters. For this purpose the attaching-bolts *f²* of the front chute-bars engage longitudinal slots *f³* in said arms *F'*, thereby permitting the front chute-bars to be
130 moved toward and away from the rear chute-bars. The lower ends of the bars *f f'* are curved inwardly to direct the cans to the space between the upper and lower dies.

The rear bars f terminate in rear of the parallel portions of the connected series of dies C, so as to enable the can to engage said dies when delivered over the first horizontal dies of the series, and in order to prevent the cans dropping downwardly after they leave the forward ends of the rearmost chute-bars such chute is provided between said bars with a curved flat plate f^4 , as shown in Figs. 2 and 3, which is attached to one of said bars f , said guide-plate being extended forwardly to fully deliver the cans to the rearmost of the movable series of dies. The chute is also laterally adjustable to accommodate cans of different lengths, and two of the bars $f f'$ at one side of the chute are therefore movable toward and from the other pair of bars in a manner to vary the width of the chute. As a means providing for such lateral adjustment one of the arms F' , supporting the corresponding bar on the one side of the chute, is movably connected with the upper transverse member A^2 of the frame, said transverse member being herein shown as provided with two longitudinal slots α^2 , through which extend the bolts f^5 , by which the said arm F' is attached to the transverse member or bar.

In Figs. 5 and 6 are shown fragmentary views of cans adapted to be operated upon by the machine described, Fig. 5 showing the head G of the can placed on the body G' as it will be fixed thereto by the heading-machine and Fig. 6 illustrating the position of the flange g of said head after the can has passed through the crimping-machine.

In the operation of the machine the cans are fed continuously to the upper end of the chute F and are by said chute delivered to the receiving end of the machine into the space between the upper stationary dies and the lower movable dies and are carried forwardly by said movable dies until brought into contact with the rear ends of the stationary dies. Said dies exert a gripping pressure on the flanges g of the cans and press or crimp said flanges upon the can-bodies. The gripping pressure exerted by said upper and lower dies upon the cans is sufficient to impart from the traveling dies a rolling movement to the cans which carries the cans through the machine from one end to the other of the stationary dies. The length of the upper dies B is at least as great and preferably slightly greater than the circumference of the cans of greatest diameter which are passed through the machine, so that said cans of the greatest diameter will be given one entire rotation in their traverse through the machine, whereby all parts of the can-heads are brought into crimping relation to the dies. The receiving ends of the upper dies are preferably slightly cut away, as shown in Fig. 1, so as to enlarge the receiving-space for the cans and to permit the cans to readily enter between the dies.

An important feature of the construction

and operation of my improved machine is its adaptability to operate upon cans of varying diameters and lengths, as I am enabled thereby to adjust the machine to cans or like sheet-metal vessels of varying dimensions without the substitution of any of the parts of the machine and by simple manipulation of the adjustable parts. This feature of my invention may be applied to machines having dies of other form differently arranged from that herein shown.

The particular form of the dies and the means for operating the same are also of considerable practical importance, as the mechanism is of a simple and durable structure and embraces a small number of parts which are not likely to become disorganized. So far as the compressing operation of the movable dies is concerned it is obvious that the same results may be attained by the use of rigid movable dies, which have a reciprocatory movement instead of a continuously-forward movement, as herein shown. Furthermore, in the machine shown the connected series of movable dies when parallel with the stationary dies and supported in opposing relation thereto by the bars A^3 constitute, in effect, two straight dies like the upper dies. So far as certain features of my invention are concerned both the upper and lower dies are flanged to constitute crimping-surfaces; but it is obvious that the cans may be crimped by the dies on one side of the machine only, the opposing dies in such instance constituting merely abutting surfaces to hold the cans against the crimping-surfaces of the other dies.

Preferably a discharge-chute is located at the front end of the machine to discharge the cans at a distance from the machine. Said chute is shown as formed by forwardly and downwardly curved extensions e^3 of the side guide-bars E and similarly-curved angle-bars e^4 , located below the extensions e^3 and attached thereto by short plates e^5 , as shown in Fig. 1. By reason of the fact that one of the bars E is attached to the movable die-bar B and that a part of the chute is formed by an extension of the bar E so connected with said movable die-bar said chute will be automatically adjusted to accommodate different-length cans at the same time the upper die-bar is adjusted for this purpose.

The structural details may be otherwise varied than hereinabove set forth without departing from the spirit of my invention, and I do not wish to be limited to such details except as hereinafter made the subject of specific claims. For instance, the relative positions of the upper and lower dies may be reversed, though the arrangement shown is believed to be the most desirable one.

I claim as my invention—

1. A machine for fastening the heads of cylindric cans and like sheet-metal vessels to the bodies thereof, comprising a series of dies connected to form an endless chain, means

for imparting longitudinal movement to said series of dies, and a die opposing and made of the same cross-section as that of said series of connected dies, between which the
5 head-flanges of the sheet-metal vessel are compressed.

2. A machine for fastening the heads of cylindric cans and like sheet-metal vessels to the bodies thereof, comprising a series of dies
10 connected end to end to form an endless chain, means for imparting longitudinal movement to said series of dies, a straight die opposing and having the same cross-section as that of said series of dies, and parallel with a portion
15 of the series of movable dies, and means for delivering cans between said opposing dies.

3. A machine for fastening the heads of cylindric cans and like sheet-metal vessels to the bodies thereof, comprising a series of dies
20 connected to form an endless chain, means for imparting longitudinal movement to said series of dies, a die opposing and made of the same cross-section as that of said series of connected dies, between which the head-
25 flanges of the sheet-metal vessel are compressed and means for moving said dies toward and from each other to adjust the machine to vessels of varying dimensions.

4. A machine for simultaneously fastening
30 the heads of a cylindric sheet-metal can or like vessel to the body thereof, comprising two series of dies connected to form two parallel endless chains, means for imparting longitudinal movement to said series of dies, and
35 two parallel stationary dies opposing and made of the same cross-section as that of said series of movable dies between which and the movable dies the head-flanges are compressed.

40 5. A machine for simultaneously fastening the heads of a cylindric sheet-metal can or like vessel to the body thereof, comprising two series of dies connected to form two parallel endless chains, means for imparting longitu-
45 dinal movement to said series of dies, two parallel stationary dies opposing and made of the same cross-section as that of said series of movable dies between which and the movable dies the head-flanges are com-
50 pressed, and means for continuously delivering cans between said opposing dies.

6. A machine for simultaneously fastening the heads of a cylindric sheet-metal can or like vessel to the body thereof, comprising
55 two series of dies connected to form two endless chains, means for imparting longitudinal movement to said series of dies, two parallel stationary dies opposing and made of the same cross-section as that of said series of mov-
60 able dies and between which and the movable dies the head-flanges are compressed, and means for varying the distance between the stationary and movable dies to adjust the machine to cans of varying diameters.

65 7. A machine for simultaneously fastening the heads of a cylindric sheet-metal can or

like vessel to the body thereof, comprising two series of dies connected to form two parallel endless chains, means for imparting longitudinal movement to said series of dies,
70 two stationary dies opposing and made of the same cross-section as that of said series of movable dies and between which and the movable dies the head-flanges are compressed, and means for moving one of the stationary
75 dies and one series of the movable dies toward and from the other stationary and movable dies to adjust the machine to cans of varying lengths.

8. A machine for simultaneously fastening
80 the heads of a cylindric sheet-metal can or like vessel to the body thereof, comprising two series of dies connected to form two parallel endless chains, means for imparting longitudinal movement to said series of dies,
85 two parallel stationary dies opposing and made of the same cross-section as that of said series of movable dies and between which and the movable dies the head-flanges are compressed, means for varying the dis-
90 tance between said dies to adjust the machine to cans of varying dimensions, a chute for delivering the cans between the stationary and movable dies and means for varying the dimensions of the chute to correspond with
95 the adjustment of the dies.

9. A machine for simultaneously fastening the two heads of a cylindric can or like vessel to the body thereof, comprising a plural-
100 ity of dies connected end to end in overlapping relation to form two endless series or chains, link-bars extending through openings in the overlapping parts of said dies for connecting the same together, rotative sprocket-
105 wheels with which said link-bars are engaged, two parallel stationary dies opposing said series of movable dies and longitudinal bars or tracks on the machine-frame which support the ends of said link-bars.

10. A machine for simultaneously fasten-
110 ing the two heads of a cylindric sheet-metal can or like vessel to the body thereof, comprising a plurality of dies connected end to end in overlapping relation to form two series or chains, link-bars extending through
115 openings in the overlapping parts of said dies for connecting the same together, rotative sprocket-wheels with which the link-bars are engaged, two stationary parallel dies opposing the series of movable dies, longitudinal
120 bars or tracks on the machine-frame parallel with the movable dies and antifriction-rollers on the ends of said link-bars which rest and roll on said bars or tracks.

11. A machine for the purpose set forth
125 comprising two vertical standards at each end thereof, two cross-bars extending between said standards and vertically movable thereon, horizontal die-bars extending between and attached at their ends to said cross-bars,
130 one of said die-bars being horizontally adjustable on said cross-bars and two series of

connected dies movable in paths parallel with said die-bars, said series of dies being movable toward and away from each other.

12. A machine for the purpose set forth
5 comprising a frame having at its ends two horizontal, vertically-adjustable cross-bars, straight die-bars extending between and horizontally adjustable on said bars, a plurality of dies connected end to end to form two end-
10 less series or chains, and located beneath said die-bars, link-bars extending through openings in overlapping parts of said dies, and horizontal tracks on the frame on which said link-bars are supported as they pass beneath
15 said die-bars.

13. A machine for the purpose set forth comprising two parallel straight die-bars, two series of short dies which are connected to form an endless chain, and the upper laps of
20 which travel in paths parallel with said die-bars, means for moving one set of dies from the other to accommodate cans of different diameters, and guide-bars parallel with said dies adapted to engage the ends of the cans
25 while passing between the dies, said guide-

bars being movable with the vertically-adjustable set of dies.

14. A machine for the purpose set forth comprising two upper and two lower opposing, parallel dies between which the head- 30 flanges of the can are compressed, means for adjusting said dies to accommodate cans of varying diameters and lengths, and a chute for delivering the cans to the space between said opposing dies comprising two pairs of 35 bars arranged to form a rectangular chute, the bars of each pair being movable toward and away from each other and one pair of the bars being also movable toward and from the other pair, whereby the chute may be adjusted 40 to cans of varying lengths and diameters.

In testimony that I personally claim the foregoing as my own invention I hereto affix my signature, in presence of two witnesses, this 21st day of April, A. D. 1902.

CHARLES STECHER.

Witnesses:

JNO. M. GLEASON,

DAVID A. FITZGIBBON.