No. 744,698. PATENTED NOV. 17, 1903.

C. STECHER & P. FULFORD.

MACHINE FOR CONNECTING CAN HEADS WITH THE BODIES THEREOF.

APPLICATION FILED AUG. 2, 1902.

NO MODEL. 11 SHEETS—SHEET 1.

Fig 1

Witnesses:-
Earl A. Crawford
William H. Hall

Inventors
Charles Stecher
Peter Fulford
by Poole Brown
their Attorneys

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NO MODEL. 11 SHEETS—SHEET 2.

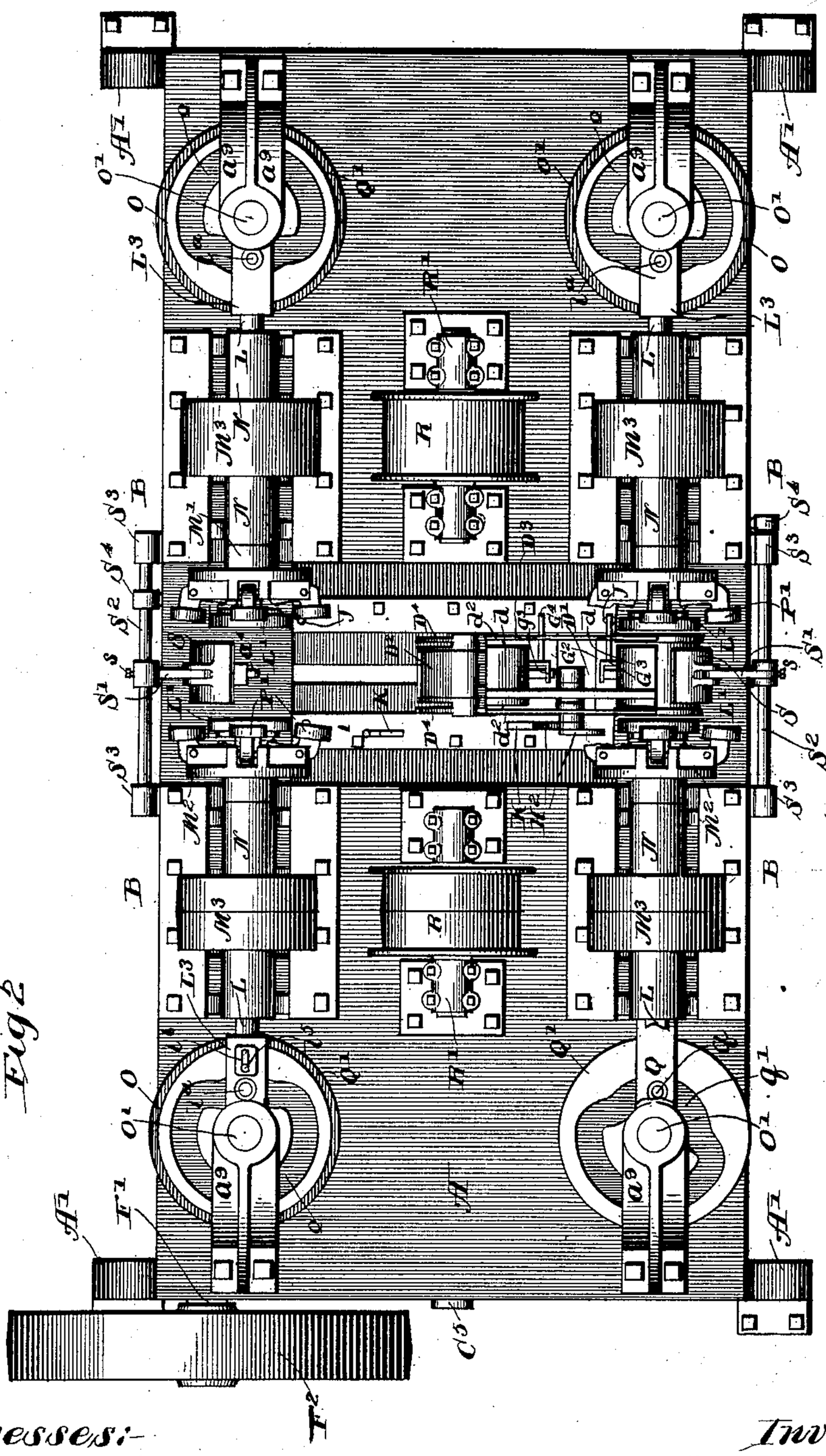

Fig 2

Witnesses:-
Carl S. Crawford
Willcam H. Hall

Inventors:
Charles Stecher
Peter Fulford
by Poole & Brown
their Attorneys

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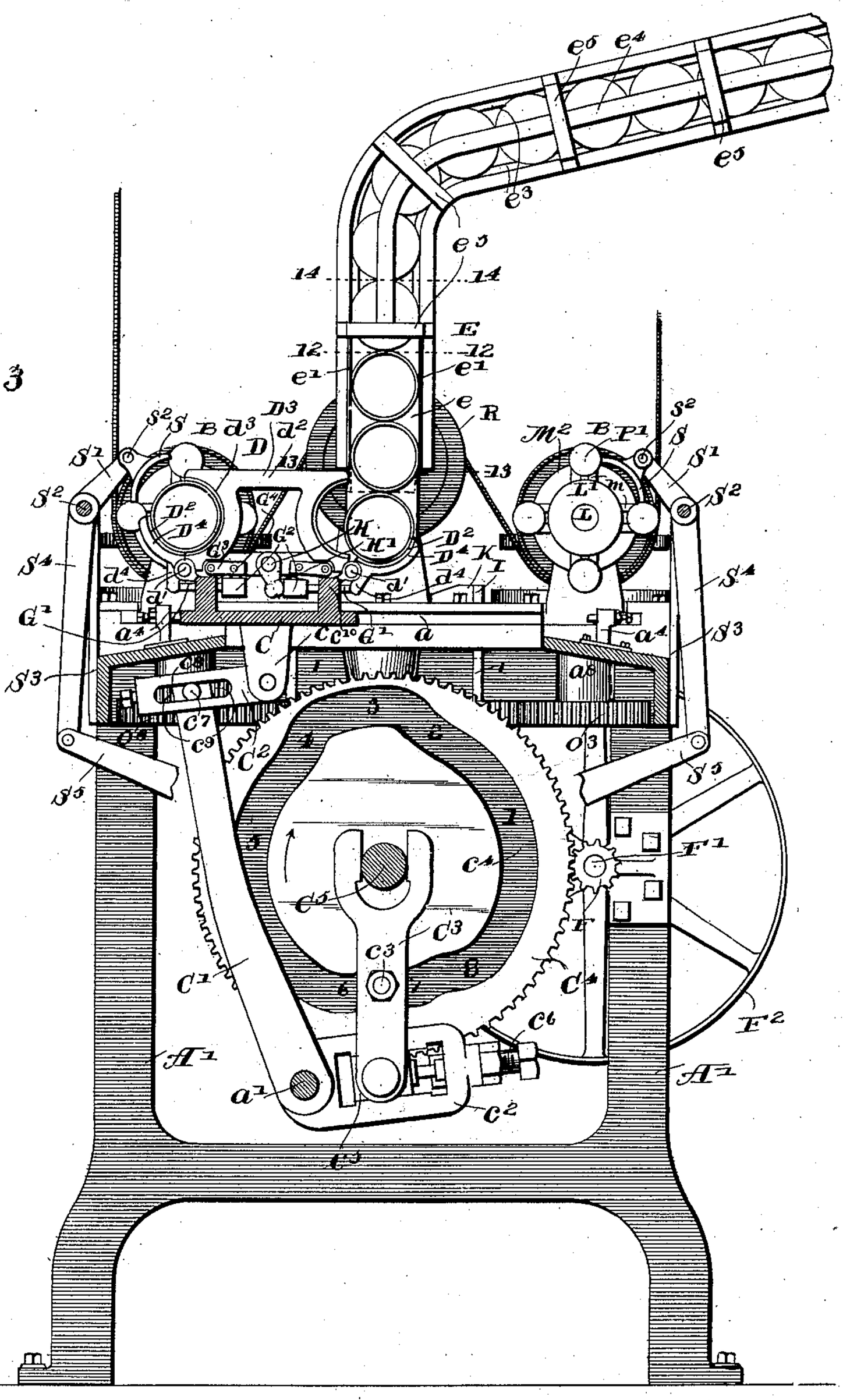
NO MODEL. 11 SHEETS—SHEET 3.

Fig 3



Witnesses:-
Carl S. Crawford
William Littell

Inventors.
Charles Stecher
Peter Fulford
by Poole & Bowie their Attorneys

No. 744,698. PATENTED NOV. 17, 1903.

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MACHINE FOR CONNECTING CAN HEADS WITH THE BODIES THEREOF.

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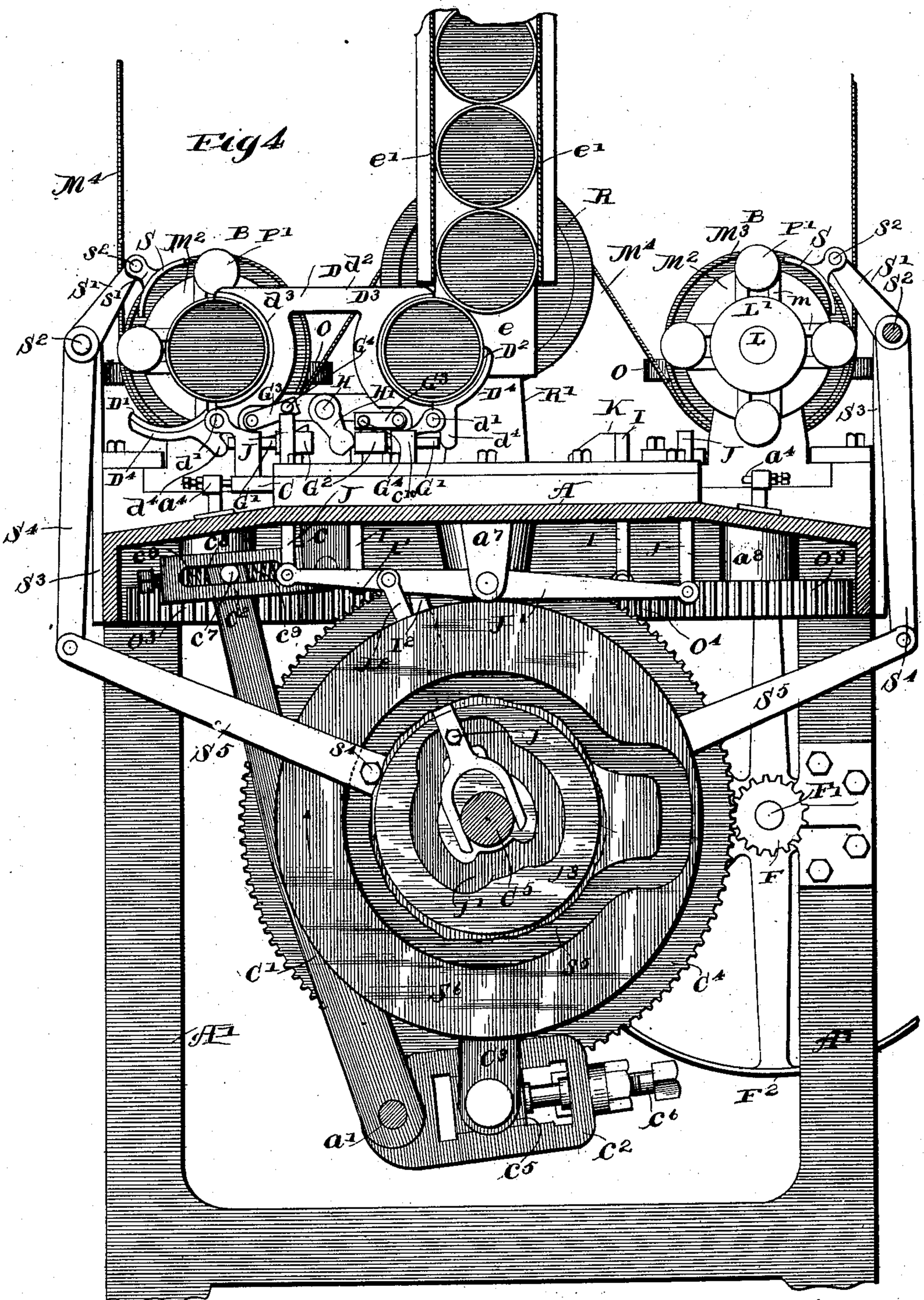
NO MODEL. 11 SHEETS—SHEET 4.

Fig 4



Witnesses:-
Carl S. Crawford
William H. Hall,

Inventors:-
Charles Stecher
Peter Fulford
by Poole & Brown their Attorneys

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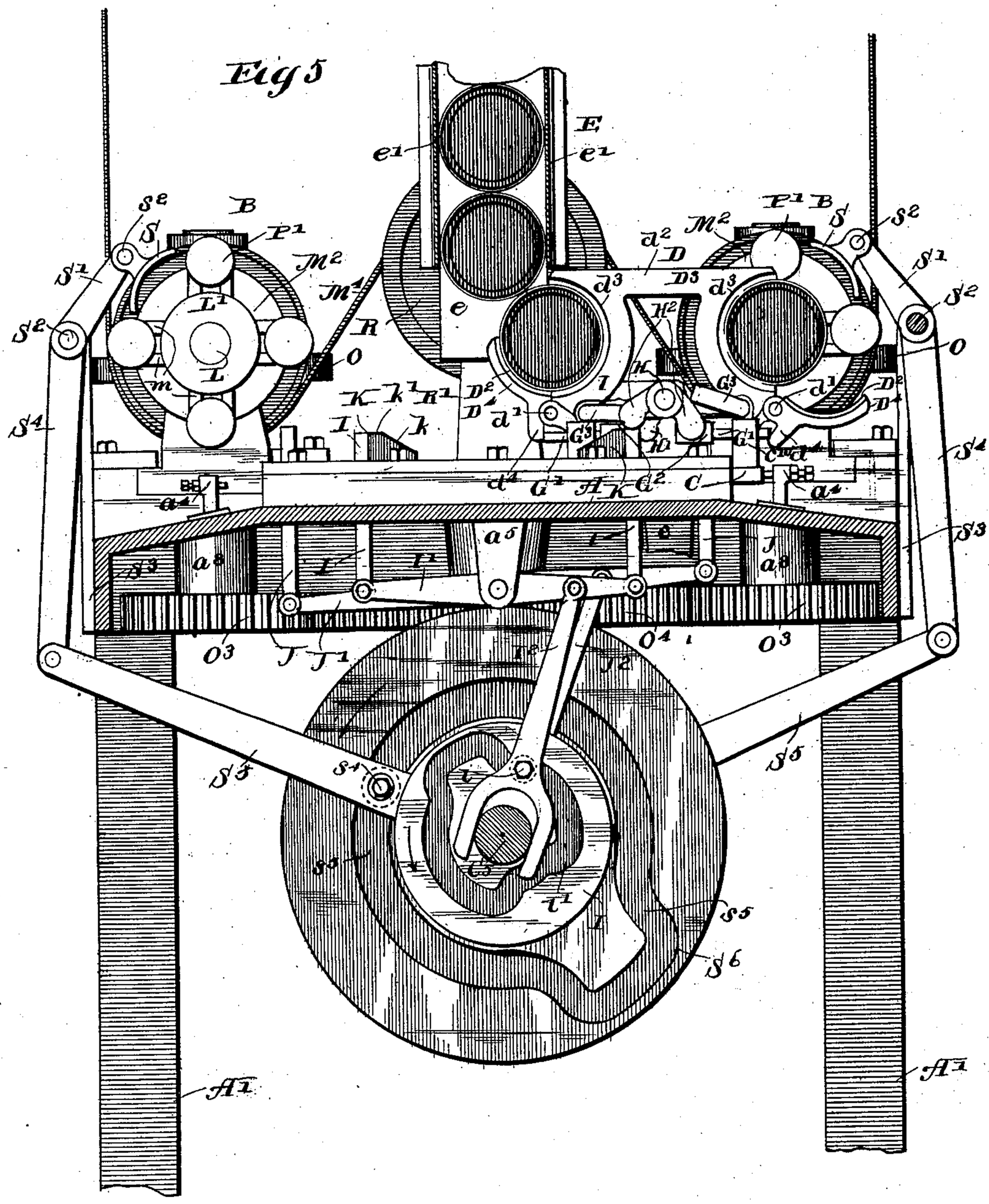
NO MODEL. 11 SHEETS—SHEET 5.

Fig 5



Witnesses:
Earl S. Crawford
William H. Hall

Inventors:
Charles Stecher
Peter Fulford
by Poole & Moore their Attorneys

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NO MODEL. 11 SHEETS—SHEET 6.

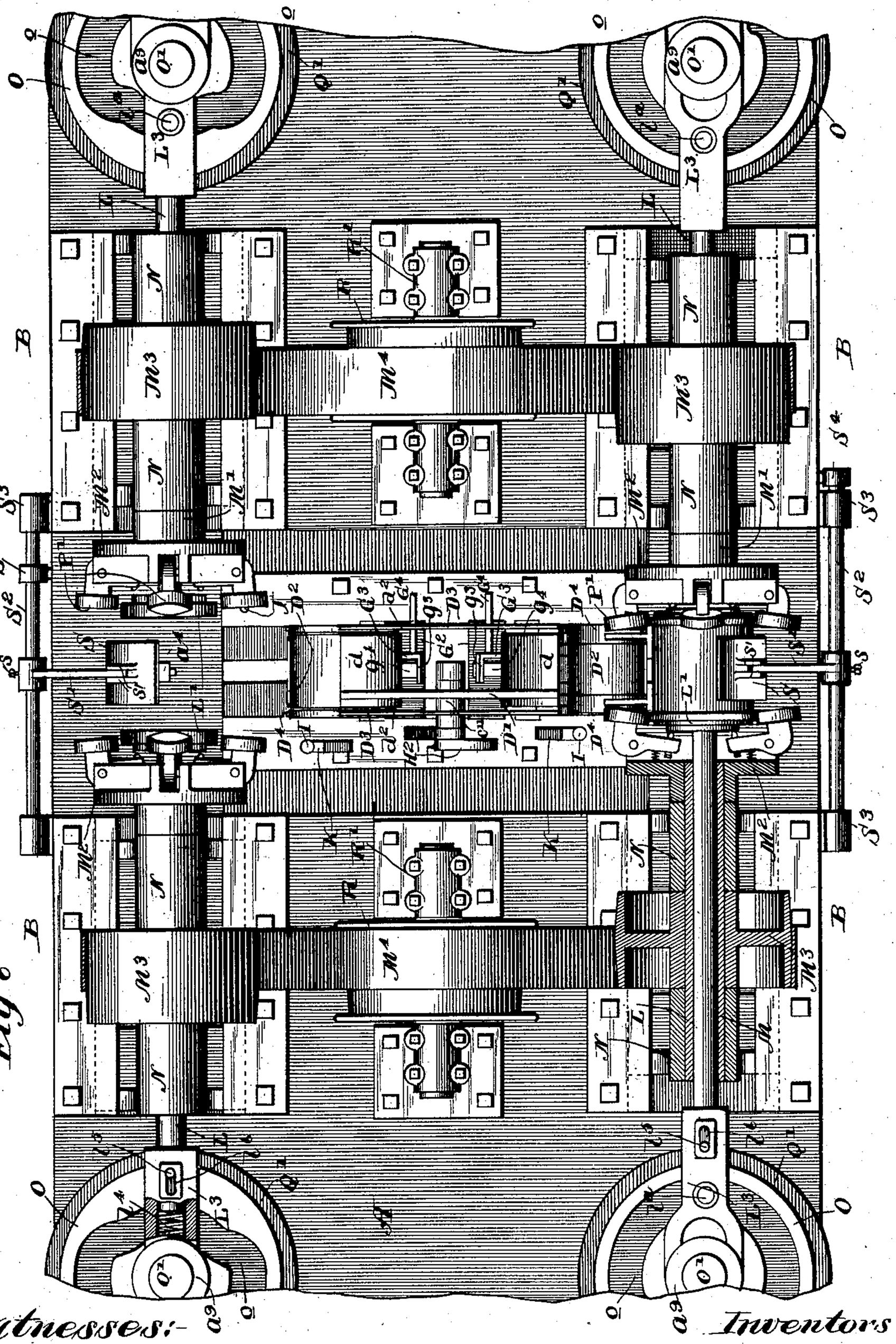

Fig 6

Witnesses:-
Carl S. Crawford
William H. Hall

Inventors
Charles Stecher
Peter Fulford
by Poole & Bruce
their Attorneys

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C. STECHER & P. FULFORD.

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NO MODEL. 11 SHEETS—SHEET 7.

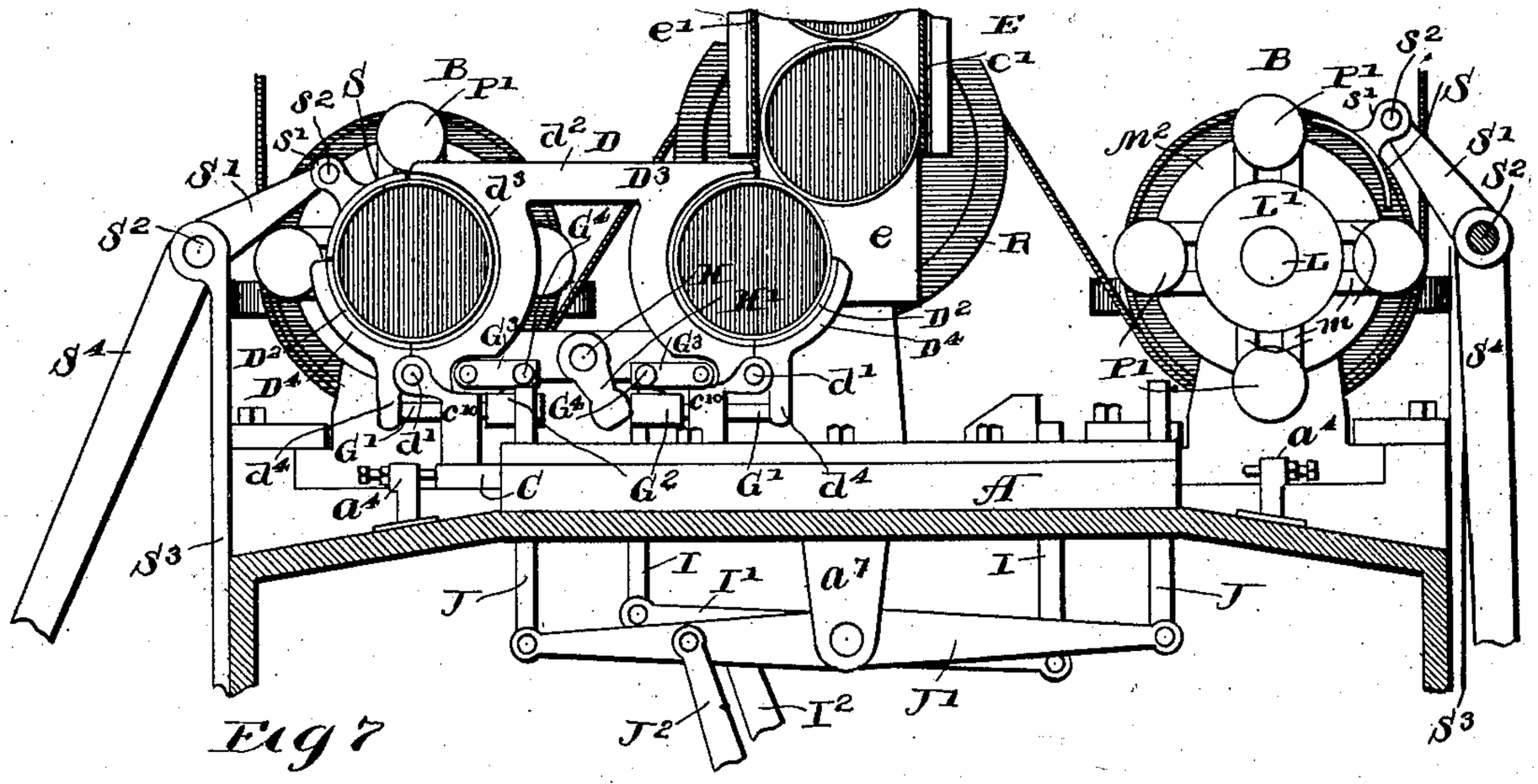
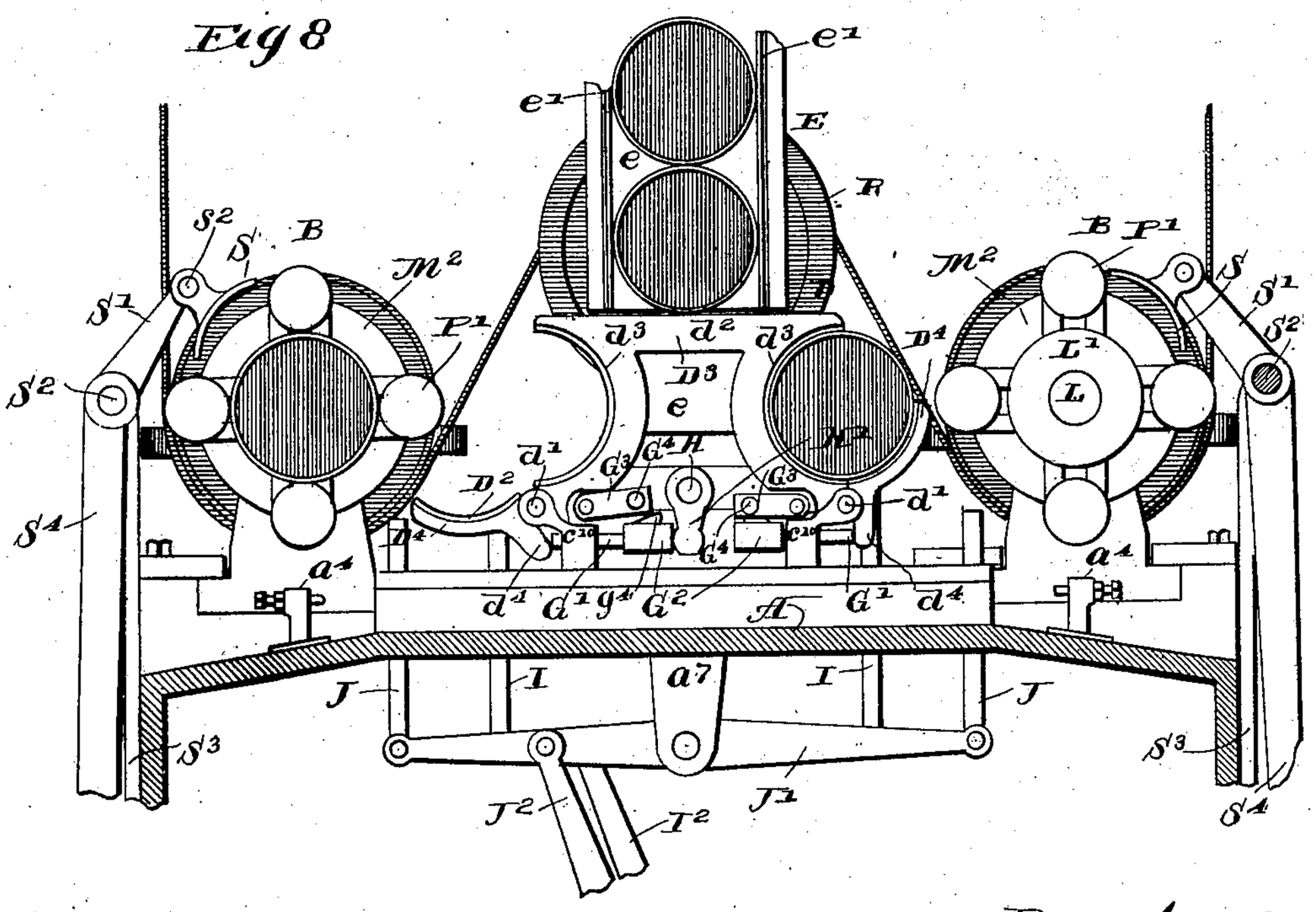


Fig 7

Fig 8



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by Poole & Brown their Attorneys

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NO MODEL. 11 SHEETS—SHEET 8.

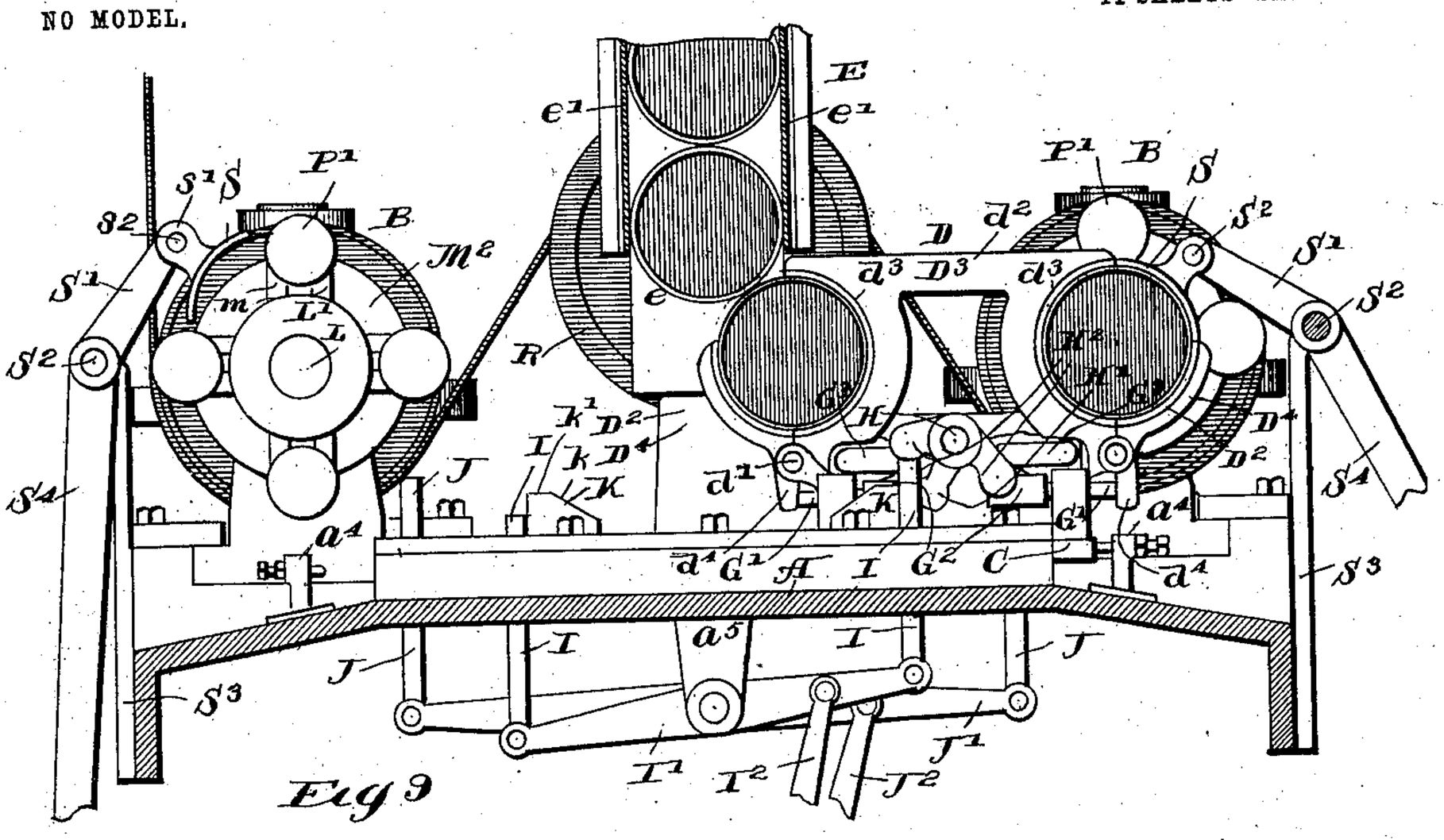

Fig 9

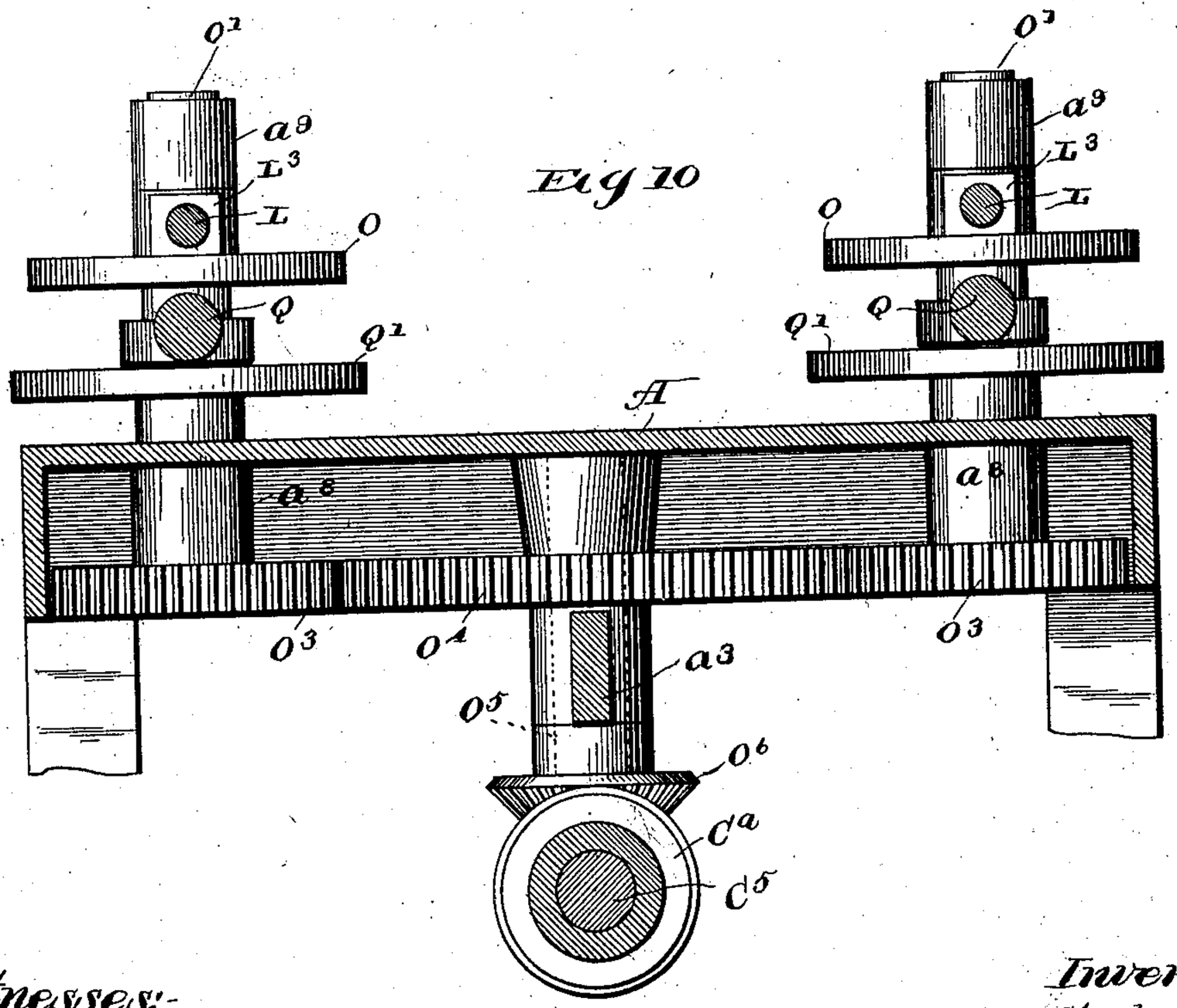

Fig 10

Witnesses:-
Carl H. Crawford
William H. Hall

Inventors.
Charles Stecher
Peter Fulford
by Poole & Bruce their Attorneys

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NO MODEL. 11 SHEETS—SHEET 9.

Fig 11

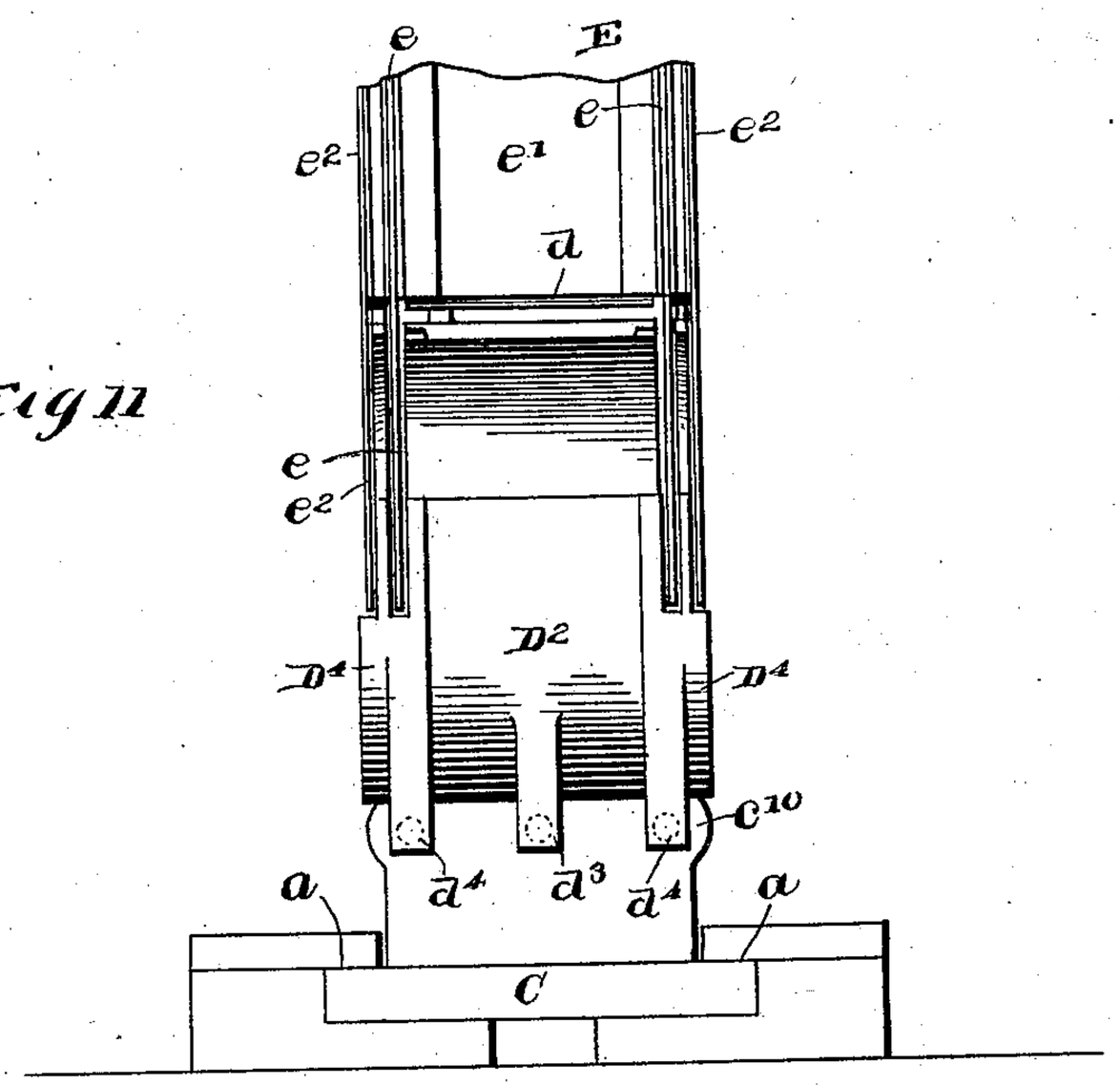


Fig 12

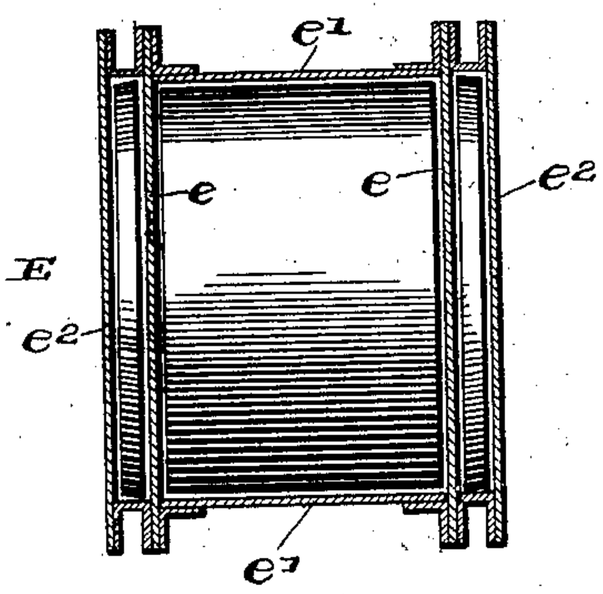


Fig 13

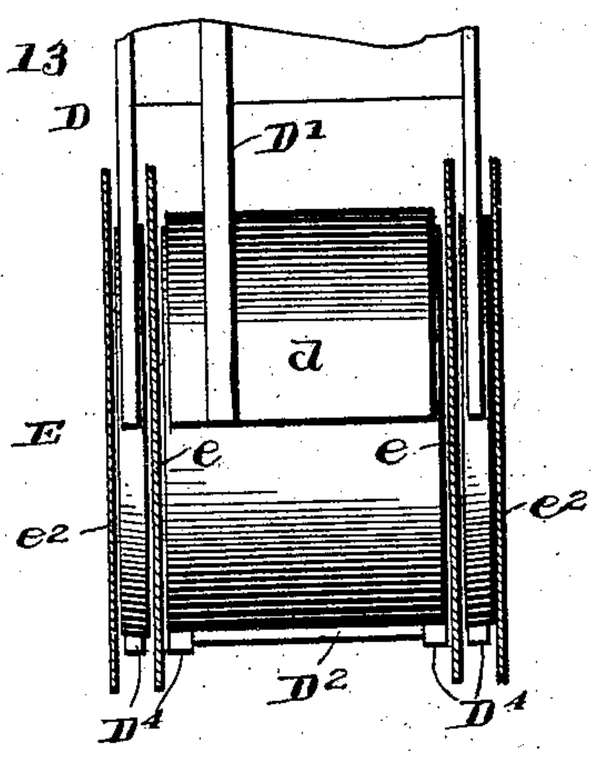
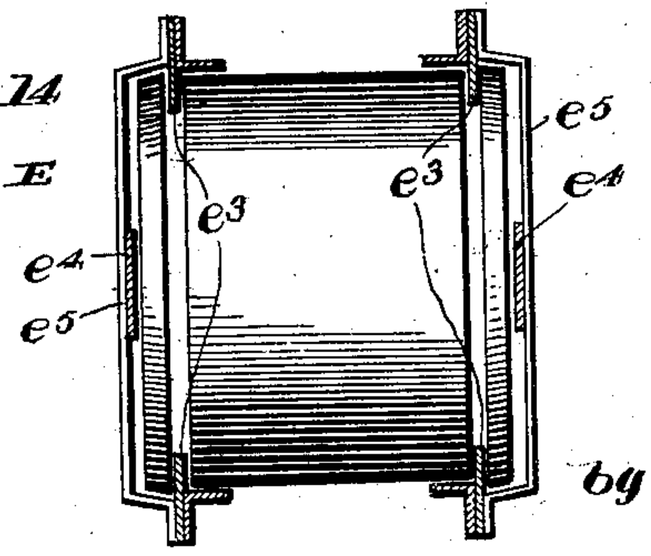


Fig 14



Witnesses:-
Carl L. Crawford
Willmer Hall,

Inventors:-
Charles Stecher
Peter Fulford
by Poole & Brown
their Attorneys

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MACHINE FOR CONNECTING CAN HEADS WITH THE BODIES THEREOF.

APPLICATION FILED AUG. 2, 1902.

11 SHEETS—SHEET 10.

NO MODEL.

Fig 15

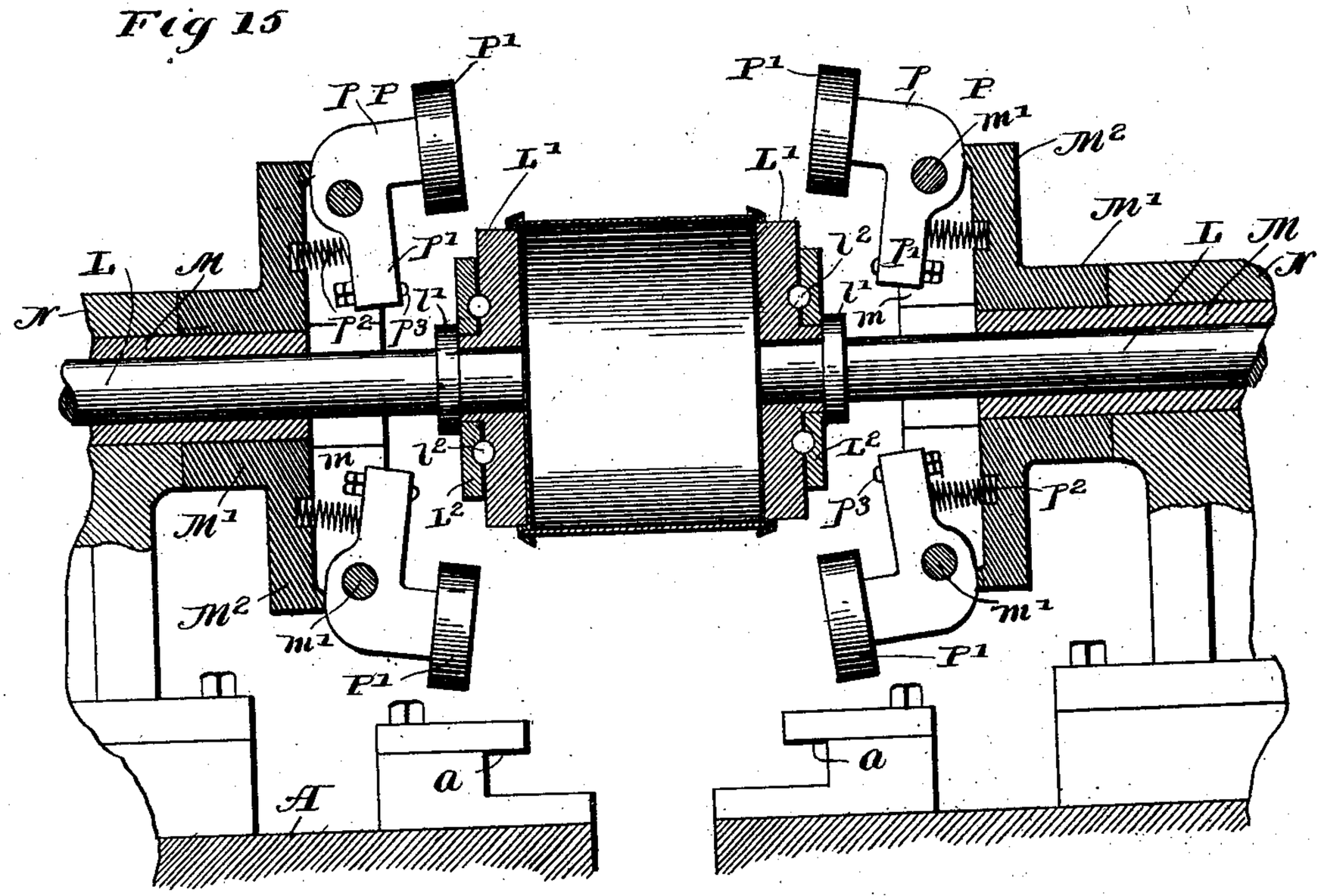
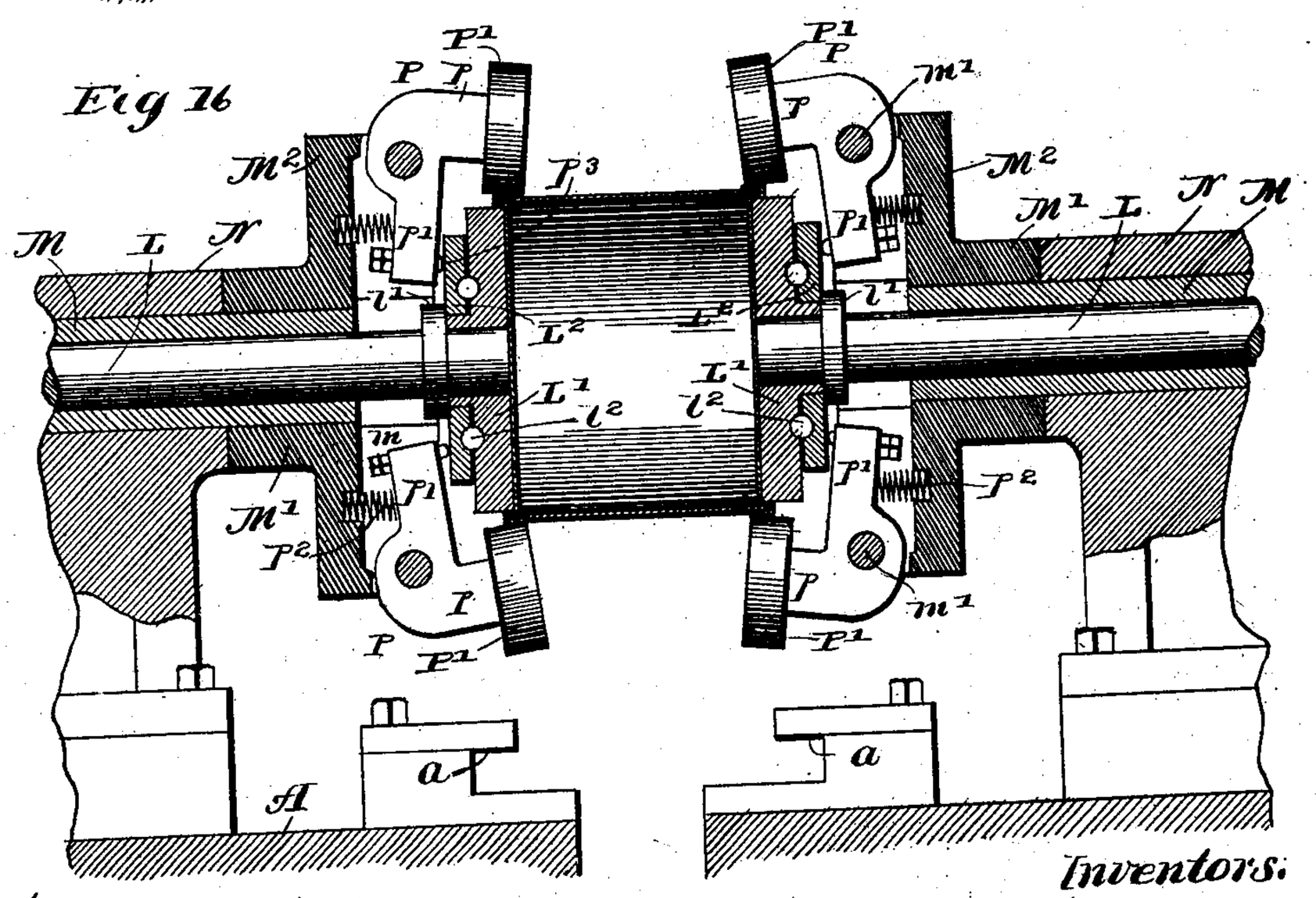


Fig 16



Witnesses:
Carl A. Crawford
William H. Hall.

Inventors:
Charles Stecher
Peter Fulford
by Poole & Brown their Attorneys

No. 744,698. PATENTED NOV. 17, 1903.

C. STECHER & P. FULFORD.

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APPLICATION FILED AUG. 2, 1902.

NO MODEL. 11 SHEETS—SHEET 11.

Fig 18

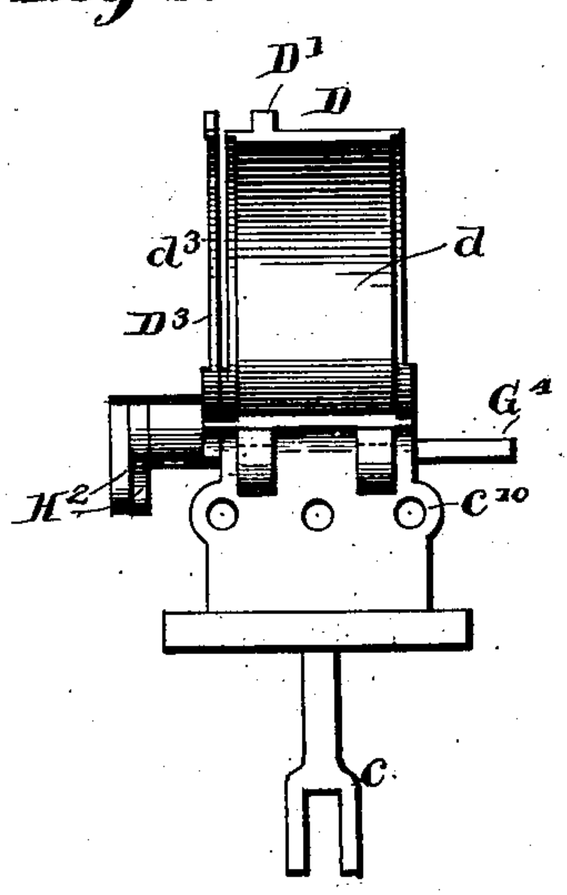


Fig 17

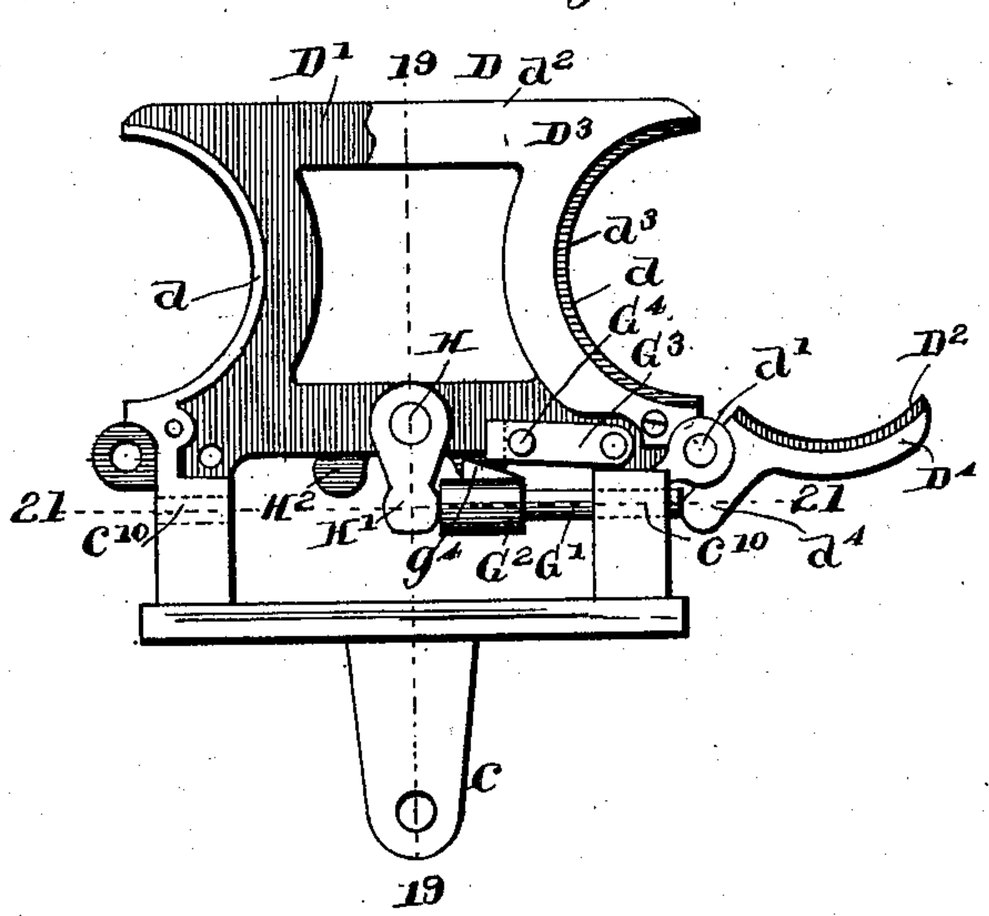


Fig 19

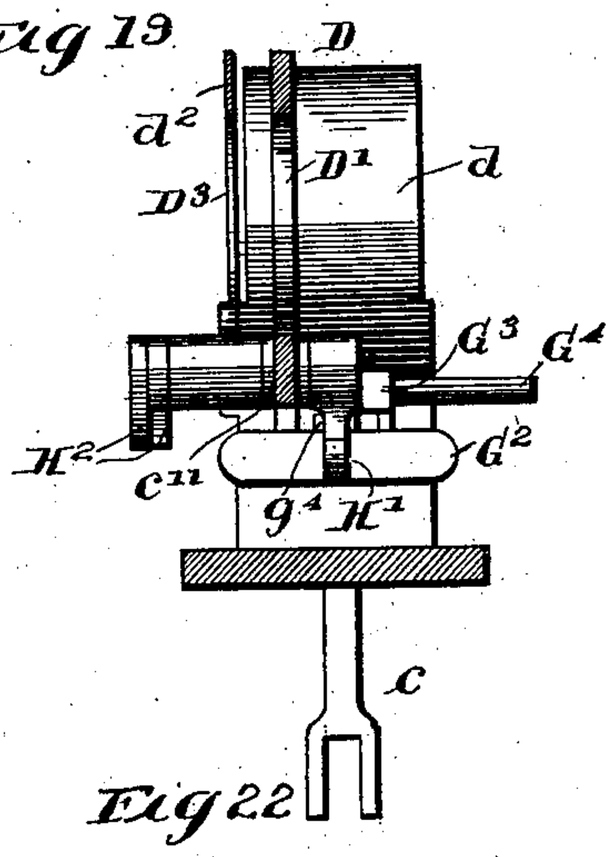


Fig 20

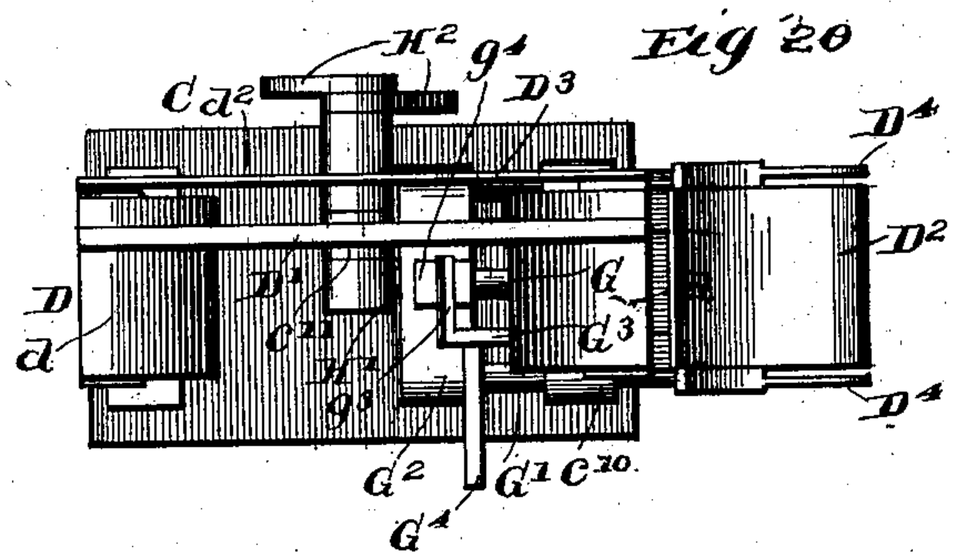


Fig 22

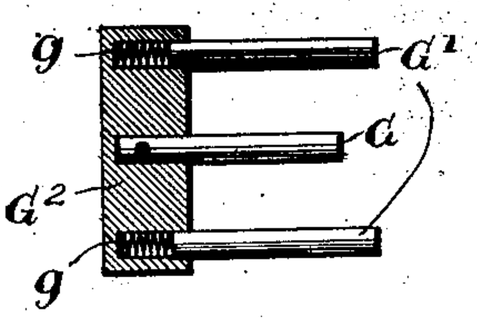
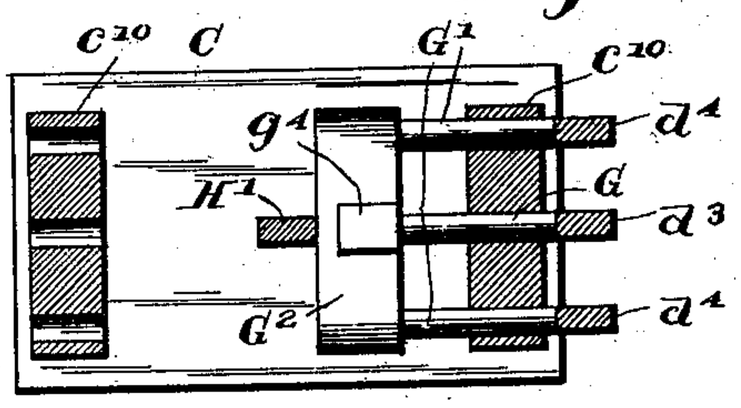


Fig 21



Witnesses:-
Carl S. Crawford
William H. Hall

Inventors:-
Charles Stecher
Peter Fulford
by Poole & Brown their Attorneys

No. 744,698. Patented November 17, 1903.

UNITED STATES PATENT OFFICE.

CHARLES STECHER, OF POINT EDWARD, CANADA, AND PETER FULFORD, OF PORT HURON, MICHIGAN, ASSIGNORS OF ONE-THIRD TO WILLIAM S. CUMMING, OF NORTH PORT HURON, MICHIGAN.

MACHINE FOR CONNECTING CAN-HEADS WITH THE BODIES THEREOF.

SPECIFICATION forming part of Letters Patent No. 744,698, dated November 17, 1903.

Application filed August 2, 1902. Serial No. 118,097. (No model.)

To all whom it may concern:

Be it known that we, CHARLES STECHER, of Point Edward, Province of Ontario, and Dominion of Canada, and PETER FULFORD, of Port Huron, in the county of St. Clair and State of Michigan, have invented certain new and useful Improvements in Machines for Connecting Can-Heads with the Bodies Thereof; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in machines for making sheet-metal cans, and refers more specifically to machines adapted to place can-heads upon the bodies thereof and to crimp the flanges of the heads upon said bodies, the operation being a combination of what is known as a "heading" and "crimping" operation.

The general organization of a machine made in accordance with our invention also well adapts the same to the work of heading without the subsequent operation of crimping, as will hereinafter more fully appear. Moreover, the mechanism may also be employed for crimping cans the heads of which have already been placed upon the bodies.

So far as certain of the features of our invention are concerned the machine may embrace but a single heading and crimping mechanism.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation of a machine embodying the improvements constituting our invention. Fig. 2 is a top plan view thereof with the feeding-chute removed and other parts broken away. Fig. 3 is a vertical section taken on line 3 3 of Fig. 1. Fig. 4 is a vertical section taken on line 4 4 of Fig. 1. Fig. 5 is a vertical section taken on line 5 5 of Fig. 1. Fig. 6 is an enlarged plan view of the central part of the machine with parts broken away. Fig. 7 is a view of the operative parts of the machine, similar to that of Fig. 4, showing the truing devices in operation. Fig. 8 is a view on the same line as Fig. 7, showing the carriage in its central position. Fig. 9 is a view of the operative parts of the machine, taken on the same line as Fig. 5, with the parts in changed positions. Fig. 10 is a vertical section taken on line 10 10 of Fig. 1. Fig. 11 is a fragmentary view showing the feed-chute and the adjacent parts of the head and fingers for removing the cans therefrom. Fig. 12 is a cross-section of the chute, taken on line 12 12 of Fig. 3. Fig. 13 is a similar view of the chute, taken on line 13 13 of Fig. 3. Fig. 14 is a cross-section of the chute, taken on line 14 14 of Fig. 3. Fig. 15 is an enlarged detached fragmentary view of the heading and crimping devices, showing the mechanism just after the heads have been applied to the can-bodies. Fig. 16 is a similar view showing the crimping-rolls acting upon the head-flanges to crimp the same upon the can-bodies. Fig. 17 is a side elevation of the carriage and head removed from the machine, with parts broken away. Fig. 18 is an end view of the same. Fig. 19 is a section on line 19 19 of Fig. 17. Fig. 20 is a top plan view of the parts shown in Fig. 17. Fig. 21 is a section taken on line 21 21 of Fig. 17. Fig. 22 is a detail of the finger-actuating plungers and cross-bar or yoke, showing the latter in section.

A machine embodying our invention embraces generally two sets of mechanisms for connecting can-heads with the bodies thereof, (which mechanisms may be combined heading and crimping mechanisms or individual heading or crimping mechanisms,) a carriage reciprocating between said mechanisms and provided with means for carrying the can heads and bodies set by set and delivering them to said mechanisms, and a delivery-chute located between said mechanisms and over the carriage and adapted for delivering the can heads and bodies set by set to said carriage as the carriage reciprocates beneath the same. The double or heading and crimping form of the mechanisms is herein shown. The parts are so arranged that when the carriage is at one limit of its movement it is in position to deliver a set of can members to one of the heading and crimping mechanisms,

and the other end of the head is in position to receive a set of can members from the feed-chute. After one set of can members has been delivered by one end of the carriage to one of the heading and crimping mechanisms the carriage is shifted to the other heading and crimping mechanism to deliver to said mechanism the set of can members which has just been received by said carriage from the chute, while the end of the carriage from which the set has just been released is moved into position to receive another set from the chute. In the continuous operation of the machine the carriage reciprocates backwardly and forwardly beneath the chute and between two combined heading and crimping mechanisms and acts to alternately deliver sets of can heads and bodies thereto, whereby the capacity of the machine is greatly increased as compared to a machine having but a single heading and crimping mechanism.

Referring now to the details of construction of the machine herein illustrated as one example or embodiment of our invention, said construction is made as follows:

A designates a horizontal frame-plate which is rectangular and is supported on standards A′ A′, located one at each corner thereof.

B B designate in a general way, as shown in Fig. 2, combined heading and crimping mechanisms located one at each side of the frame-plate and near the longitudinal center thereof and constructed to simultaneously force both can-heads upon the body thereof and to crimp the flanges of said heads upon the body.

C designates a horizontally-movable carriage which reciprocates between the heading and crimping mechanisms and moves in transverse guides or ways *a* in the frame-plate, as shown in Fig. 3. Attached to or formed on said carriage is a head, designated as a whole by D and which is constructed to receive the can heads and bodies from a chute E, located over the path of the carriage, said chute being located centrally between the heading and crimping mechanisms. The chute preferably consists of a lower vertical part and an upper oblique part, which latter is made of a length to extend away from or clear the frame-plate, whereby can heads and bodies may be easily fed to the chute.

The construction of the chute is more clearly shown in Figs. 11 to 14, inclusive. Said chute is provided with a central runway for the can-bodies and is made of a cross-section to correspond with the shape of the can-bodies. The chute consists at its lower end of side members *e e* and edge members *e′ e′*, suitably secured together by angle-bars, as shown in Figs. 12 and 14, and forming the central runway for the can-bodies. At the sides of the chute are formed narrow runways for the can-heads, said runways being formed between the side walls *e* of the chute and other walls e^2. The edge walls *e′ e′* extend continuously along the chute from end to end and constitute the upper and lower walls of the oblique horizontal part of the chute. The sides walls *e* are, however, replaced from points below the bend of the chute to the outer end thereof by narrow strips e^3, which extend only a slight distance inside the edge walls, and the plates e^2 are replaced by centrally-located strips or bars e^4, which are held in place by means of cross-bars e^5, as most clearly shown in Figs. 3 and 14. The lower ends of the side walls *e* and the plates e^2 extend below the edge walls *e′* for a purpose to be hereinafter explained.

The carriage C is operated to carry the head D from one end of its travel to the other through the medium of the following mechanism: C′, Figs. 1, 3, and 4, designates a carriage-actuating lever, which is connected at its upper end by a link C^2 with a lug *c*, extending downwardly from the carriage through a slot in the frame-plate. Said carriage-actuating lever C′ is pivoted at its lower end upon a horizontal shaft *a′*, which is mounted in the lower ends of vertical hangers a^2, depending from the frame-plate of the machine, as most clearly shown in Fig. 1. Said carriage actuating lever is provided with a hub *c′*, having a rigid laterally-extending arm c^2. Connected with said arm c^2 is a vertical cam-yoke C^3, which is provided with a cam-lug c^3, adapted to engage a cam-groove c^4 in a rotative cam-wheel C^4, which latter is affixed to a longitudinal rotative shaft C^5. Said shaft C^5 has bearing in hangers a^2, depending from the frame-plate of the machine. Said shaft also extends through the hangers a^2, which afford lateral support of the shaft. Said cam-yoke is pivoted at its lower end to a block c^5, which has sliding engagement with a groove in the arm c^2 of the carriage-actuating lever, and said block is adjustably fixed with respect to said arm by means of an adjusting-screw c^6, as shown in Fig. 3. In this manner the throw of the carriage-actuating arm may be increased or decreased, as desired, and therethrough the travel of the carriage regulated. The cam C^4 is driven by a pinion F, mounted on a rotary driving-shaft F′, which latter extends to one end of the machine and is provided with a belt-pulley F^2, through the medium of which power is imparted to rotate the same, as shown in Figs. 2 and 3.

The carriage engages at the limits of its movements stops a^4, Fig. 3, consisting of bolts which have screw-threaded engagement with upwardly-extending lugs on the frame-plate. Said stops act to regulate the travel of the carriage with respect to the centers of the heading and crimping mechanisms. The screw-threaded connection of the stop-bolts with respect to the frame-plate permits accurate adjustment of the parts.

The carriage-actuating lever C′ has yielding connection with the link C^2, by which it is connected with the carriage, thereby permitting the carriage to be brought to a posi-

tive stop at each limit of its movement in proper positions with respect to the heading and crimping mechanisms and at the same time permits a slight overthrow of the carriage-actuating lever due to wear of the parts or improper adjustment thereof. As herein shown, said lever extends upwardly into an opening in the bottom of the link and is provided with a cross-pin c^7, which engages longitudinal slots c^8 on the sides of the link. Interposed between said lever and the ends of the slots are spiral springs c^9 c^9, which act to hold the lever midway between the ends of the slots, but permit the lever to yield when the carriage strikes either of its limiting stops or abutments.

The feed-head D of the carriage is shown as made integral with the carriage, though it may be made a separate part and attached thereto. The said feed-head, however, in the construction illustrated moves positively with the carriage from side to side of the machine and directly engages the sets of cam members to carry the same from the chute to the heading and crimping mechanisms.

The design of the head is shown in Figs. 2, 6, 17, 18, 19, and 20, and consists of a vertical web D′, which is made integral with the carriage and at the ends of which are formed transversely-arranged concave seats d, made of slightly less length than that of the can-bodies to be operated upon, the transverse length of said curved seats being substantially one-half of a circle. Said curved recesses d at the ends of the head pass beneath and are adapted to receive can-bodies from the central runway of the chute. At each side of the head is a thin metal frame D^3, consisting of a horizontal part d^2, the upper margin of which is in the plane of the horizontal top margin of the web D′, and curved recessed ends d^3, which correspond with and are located at the sides of the curved recessed ends d of the head. Said curved recessed ends of the side plates D^3 of the head are adapted to receive the heads of the can and are therefore formed on longer radii than the recesses d. Said side plates register with and pass through the lower ends of the side runways of the chute for the can-heads, which latter extend below the level of the main runway, as shown in Fig. 7, so as to receive the can-heads from said runways. Coöperating with said curved recesses or seats d of the head are gripping-fingers D^2, which are made of a width approximately equal to that of said seats d. Said fingers are pivoted on pins d', extending through bearings in the web D′ of said head. The length of the curved fingers D^2 is substantially one-quarter of the circumference of the can-body, so that when the fingers are swung upwardly against the can-bodies by the means provided therefor, to be hereinafter described, approximately three-fourths of the can-body is engaged by said head and fingers. Coöperating with the curved recesses or seats d^3 at each end of the side plates D^3 are two narrow longitudinally-curved gripping-fingers D^4, between which recesses d^3 and said fingers the can-heads are grasped when said fingers are thrown upwardly. Said fingers D^4 are pivoted upon the pins d', one at each side of each finger D^2, and are formed on radii corresponding with that of the recesses or seats d^3 and being greater than that of the recesses d, for the reason that the outer diameters of the head-flanges are obviously somewhat greater than the can-bodies. The said ribs D′ of the head and the upper parts of the curved recesses d thereof are made of such height as to just clear the lower ends of the edge members e' of the chute, as clearly shown in Figs. 4 and 7, and the side members D^3 are arranged in alinement with and pass through the lower ends of the head-runways, as before stated. With this construction, therefore, when the head is located centrally beneath the delivery-chute E the can-bodies and can-heads ride on the web D′ and the upper parts d^2 of the side frames D^3, respectively. When the head is moved to one side to bring the recessed parts d d^3 of the head into register with the runways of the chute, the can body and heads fall downwardly into said curved recessed parts d d^3 of the head. Said can members are prevented from rolling off out of said recessed portions of the head at this time by slightly raising the gripping-fingers, as will hereinafter more fully appear. The downwardly-projecting parts e e^2 of the chute, between which are formed the lower ends of the runways for the can-heads, prevent lateral displacement of the can-heads with respect to the body at this time or just after the same have fallen into the recesses d^3, thereby holding said heads and body in proper position to be engaged by the fingers D^2 D^4 when said fingers are thrown upwardly. The fingers D^4 are made slightly wider than the runways for the can-heads and are therefore slitted and recessed at their outer ends for the reception of the lower ends of the walls e e^2 of the runway when the fingers occupy their uppermost positions, as shown in Fig. 11.

As before stated, the head D is made of such length with respect to the distance between the chute and the centers of the heading and crimping mechanisms that when one end of the head is in position to receive a can from the chute the other end of the head is in position to center the can members carried thereby with respect to the heading and crimping mechanism. Means are provided for actuating said fingers to engage the same with the can members after a set has been received thereby from the chute and for also releasing the fingers from another set of can members when the heading mechanism has acted thereon after centering a set with respect to the heading mechanism.

The fingers D^2 D^4 are actuated to throw the same upwardly into gripping relation with the can members by means of two sets of end-

wise-movable horizontal plungers G G′, which have sliding engagement with bearings c^{10} of the head, as shown in Figs. 17 and 21. The inner or adjacent ends of the plungers of each set are seated in recesses in a horizontal cross-bar or yoke G^2 inside of said bearings c^{10}, and the outer ends thereof extend beyond said bearing and engage lugs d^3 d^4, respectively, on the fingers D^2 D^4, below the pivots thereof. The central plunger of each set engages the lug d^3 of the associated central or wider finger for the can-body, and the side plungers engage the lugs on the fingers which grip the can-heads. In order to prevent the fingers D^4 from buckling the heads and also to afford a yielding grasp of the fingers D^4 with the can-heads, such as will permit the same to be forced upon the can-bodies while the head-fingers are yet engaged with said can-heads, the ends of the plungers, which actuate the head-fingers, bear against backing-springs g in the cross-bar or yoke G^2, as indicated in Fig. 22. The central plungers G are rigidly affixed to said cross-bar or yoke.

The two sets of plungers for the two sets of gripping-fingers are located at the same level, the cross-bars or yokes G^2 thereof being disposed parallel with each other, and said plungers are actuated to throw the fingers in their gripping positions by a common actuating device which is located between the cross-bars or yokes G^2 thereof. Said actuating device consists of a horizontal rock-shaft H, which is mounted in a vertical bearing-lug c^{11}. The inner end of said horizontal rock-shaft is provided with a rigidly-attached depending rock-arm H′, said rock-arm being located between the two cross-bars or yokes G^2 of the two sets of plungers. The outer end of said rock-shaft H is provided with two rigidly-attached oppositely-directed actuating-arms H^2 H^2, which are located laterally out of line with each other, as shown in Fig. 20, and are adapted to be engaged by vertically-reciprocating actuating-plungers I I, located one at each limit of travel of the carriage and extending upwardly through openings in the frame-plate. Said arms are adapted to be forced upwardly by said plungers when the carriage is at the limit of its movement in either direction, and thereby rock the shaft H, so as to throw the arm H′ against one of the plunger-yokes or cross-bars G^2 and act through said plungers to throw the associated fingers upwardly into their gripping positions. Said actuating-plungers I are pivotally connected with the opposite ends of a vertically-oscillatory lever I′, which is located beneath the frame-plate and is pivoted between its ends to a depending hanger a^5, Fig. 5, on the frame-plate. With this construction the plungers I are alternately thrown upwardly, so that each will engage its arm H^2 of the rock-shaft H when the carriage is at the adjacent limit of its movement. Said lever I′ is for this purpose actuated by means of a cam-yoke I^2, which is provided with a cam-stud i, which engages a cam-groove i' in a cam-wheel I^8, mounted on the shaft C^5, as clearly shown in Fig. 5. The cam-groove i' is formed to oscillate the lever I′ twice during each rotation of the cam, so that one of the plungers is thrown upwardly at each limit of the throw of the carriage to move the fingers into their locking positions.

The gripping-fingers are locked in their closed positions by means of locking devices made as follows: G^3 G^3 designate vertically-swinging latches, which are pivoted on the bearings c^{10}, through which the plungers G G′ extend, said latches swinging in vertical planes. Each of said latches is provided at its outer end with a right-angle lug g^3, which rides upon an outwardly and downwardly inclined tooth g^4 on the upper surface of the yoke or bar G^2. Said tooth is provided at its inner end with an abrupt shoulder, which is so located when the yoke or bar and plungers connected therewith are forced inwardly to their full extent, whereby the fingers are raised, that the lug g^3 of the latch drops into contact with said abrupt end face of the tooth g^4, holds or locks said cross-bar or yoke and the plungers in their forwardmost position, and therethrough locks the fingers in their closed positions. Means are provided for releasing said latches at the time the head is in position to deliver a set of can members to the heading and crimping mechanisms and after the heading operation has been performed, so as to permit said carriage to be retracted, while leaving the can members and heads engaged with the heading mechanism. Said means, as herein shown, are made as follows: The latches G^3 are provided with laterally-directed lugs or pins G^4, each of which when the head has reached either limit of its movement is located over one of a pair of vertically-reciprocating plungers J, which extend upwardly through the frame-plate of the machine. Said plungers J are pivoted at their lower ends to the opposite ends of a vertically-oscillatory lever J′. Said lever J′ is pivoted between its ends to a depending lug a^7 on the frame-plate, as shown in Fig. 4, and said lever is oscillated by means of a cam-yoke J^2, which is pivoted at its upper end to the lever and is provided with a cam-stud j, which engages a cam-groove j' of a cam J^3, affixed to the rotative shaft C^5. Said cam-groove is so formed as to oscillate the lever J′ on its axis twice during each rotation of the cam, so that at each limit of the movement of the carriage one of the pins is raised to lift one of the latches G^3 out of engagement with the tooth of the associated yoke or cross-bar and thereby release the connected plungers in a manner to allow the engaging fingers to drop downwardly by gravity, as shown in Fig. 4.

In order to insure that the can members will be retained in the recesses of the head and side plates thereof when delivered thereto by the chute and before the fingers fully close

thereon, we have provided means for partially elevating the outer ends of said fingers just prior to the delivery of the cans to the head, said means being made as follows: K K designate two inclined or cam projections which extend upwardly from the upper face of the frame-p'ate, as shown in Figs. 3, 4, and 5, and are located just inside the openings in the frame-plate through which extend the plungers I, which actuate the rock-shaft H. Said projections K, Figs. 5, and 9, are provided with inwardly and downwardly inclined faces *k* and horizontal faces *k'*. Said projections are located out of line with respect to each other, so as to bring the same in alinement with the laterally-offset oppositely-directed arms H^2 of the finger-actuating rock-shaft. With this construction just before the head is moved into position to receive one of the sets of can heads and bodies the rearwardly-directed arm H^2 of the rock-shaft H with respect to the direction of movement of the carriage strikes the inclined face *k* of the adjacent cam projection and rides upwardly thereon and thereby rocks said shaft. The angular movement of said rock-shaft acts through the plungers to gradually raise the fingers until they are brought to the position shown in Fig. 3. The arms H^2 are engaged with the horizontal parts *k'* of the cam projections slightly before the head is moved into position to receive a set of can members. Each of the arms H^2 is located over one of the actuating-plungers I when the carriage and head are arrested in position for one end of the head to receive a set of can members from the chute and for the other end of the head to deliver another set to the heading and crimping mechanism, and the parts are so timed that when a set of can members is received by one end of said head one of the plungers I rises and fully closes the fingers associated with said end of the head.

Next describing the mechanism for placing the can-heads on the bodies delivered thereto by the reciprocating head described and for crimping or folding the flanges of the can-heads on the bodies, said mechanism is made as follows: The machine is provided with two heading and crimping mechanisms located on each side of the frame-plate in alinement with each other and to which the sets of can members are alternately delivered as the carriage is arrested at each limit of its throw.

Each heading mechanism consists of two endwise-movable non-rotative plungers L L, which are mounted in hollow spindles M M, which are rotary and constitute parts of the crimping mechanism, as will hereinafter more fully appear. Said spindles M are mounted in suitable bearings N, having flanged bases, which have sliding engagement with longitudinal ways or guides in the frame-plate, as more clearly shown in Fig. 4. Said plungers are arranged in alinement with each other and are provided at their inner or adjacent ends with rigidly-attached disks or plates L', which are adapted to engage the flat faces of the can-heads and through endwise movement of the plungers to force said heads over the ends of the can-bodies. *l' l'*, Fig. 15, designate collars which are rigid on said plungers L, said collars constituting shoulders, between which and the plates L' are interposed thrust-plates L^2, which are rotative on the hubs of said plunger-plates, as shown in Figs. 15 and 16. Said plunger and thrust-plates are provided in their adjacent faces with opposing grooves forming runways for antifriction-rollers l^2, interposed between said plates. The outer ends of said plungers L are connected with cam-yokes L^3 L^3, which yokes are provided with lateral studs l^a, which engage cam-grooves *o* in horizontal cam-disks O. Said cam-disks are mounted on vertical shafts O', which extend upwardly through the frame-plate of the machine and have bearing at their lower ends in bearings a^8 and at their upper ends in bearing-brackets a^9, as more clearly shown in Figs. 1 and 2. The shafts O' at each side of the machine are rotated through the medium of horizontal gear-wheels O^3 on said shafts and a central gear-wheel O^4, which is fixed to a vertical shaft O^5. The shafts O^5 are mounted in the bearings a^3, formed on the bearings for the shaft C^5, as shown in Fig. 1, and are rotated from said shaft C^5 through the medium of bevel gear-pinions O^6 C^a on the shafts O^5 and C^5, respectively. With this construction it will be seen that during each rotation of the cams O the plunger-plates are thrust inwardly toward each other and against a set of can-heads which have been delivered therebetween by the head D, said plates acting on the can-heads to force the same over the ends of the can-bodies.

Desirably one of the cam-yokes L^3 at each side of the machine is yieldingly connected with its plunger. For this purpose the sockets in the yieldingly-connected yokes which receive the plungers are elongated, and a coiled spring l^4 (see left-hand side of Fig. 6) is inserted between the bottom of said socket and the end of the plungers. The plungers are movably connected with said yokes by means of cross-pins l^5, which extend transversely through the plungers and engage grooves l^6 in said cam-yokes in the manner shown in Fig. 6.

The spindles M are provided inside their bearings N with rigidly-attached short sleeves or collars M', provided with radial vertical flanges M^2, which constitute the crimping-heads.

P P, Figs. 15 and 16, designate a plurality of angular arms, the members *p p'* of which are disposed at right angles to each other. Said arms are pivoted near their angles to and between radially-directed lugs *m* on said heads M^2 by means of pivot-pins *m'*. The outer members *p* of the arms of each crimping-head extend laterally toward the asso-

ciated crimping-head, while the members p' of each crimping-head extend radially toward each other. Rotatively mounted on the outer ends of said members p are crimping-rollers P', which rotate on the axis of said members p. Said members p of the arms are held normally divergent with respect to each other by means of springs p^2, interposed between the heads M^2 and the inner members p' of said arms. The inner members p' of said arms are provided with adjustable stop-screws p^3, the inner ends of which screws are adapted to bear against the thrust-plate L^2, as shown in Fig. 16, when the crimping devices are moved inwardly to engage the rollers P' with the can-head flanges.

Reciprocal motion is imparted to the standards N, in which the spindles M have bearing, through the medium of cam-yokes Q, which are secured at their inner ends to said reciprocating bearings and are provided with cam-studs q, adapted to engage cam-grooves q' in horizontal cam-disks Q', affixed to the shafts O' below the cams O, as shown in Fig. 2. Rotative movement is imparted to the spindles M through the medium of pulleys M^3, affixed to said spindles between the members of the bearings N. Said pulleys are driven continuously by belts M^4. As shown, said belts M^4 pass beneath said pulleys M^3 and over intermediate idlers R, one located between each pair of standards N and mounted in suitable bearings R' on the upper face of the frame-plate of the machine. Said belts are adapted to be carried upwardly over a driving-pulley located above the machine, but not herein shown. Said pulley or idler R is made wider than the pulleys M^3 M^3, so as to permit the belt to shift laterally thereon as the standards carrying the crimping mechanisms are reciprocated to and fro.

The operation of the heading and crimping mechanism described is as follows: The cam-grooves o of the cam-disks O are so disposed as to thrust the plungers L inwardly to engage the disks L' thereof with the can-heads as soon as the movement of the head D of the carriage has been arrested with the set of can members centered with respect to the heading and crimping mechanism. By this movement of the disks the can-heads are forced upon the body. Said can-heads are forced upon the can-bodies while said heads are gripped by the fingers D^2 D^4, the yielding engagement of the fingers D^4 with the heads due to the backing-springs g engaging the plungers G' associated with said fingers D^4 permitting such operation without injury to the can-heads. Immediately after the heads are thrust upon the body the gripping-fingers D^2 D^4 are released from the can heads and body, as shown in Figs. 4 and 5, and the carriage C is retracted, carrying with it the head D. After the can-heads have been forced upon the body by the means described and the carriage retracted from the heading and crimping mechanisms the standards N are forced inwardly toward the can through the action of the cams Q and move the crimping-rollers toward the cans. As the crimping-rollers approach the flanges of the can-head they are disposed slightly divergently with respect to each other and strike the widest parts of the flanges (when the flanges are flaring, as shown in Fig. 15) before the rollers are moved inwardly by engagement of the contact-screws p^3 with the thrust-plates L^2 on the plungers L. Thereafter the contact-screws engage said plates L^2 and swing the arms P on their pivots and therethrough swing the contact-faces of the rollers from the positions shown in Fig. 15 to that shown in Fig. 16. During said operation of the crimping-rollers the spindles M are being rapidly rotated through the medium of their pulleys, thereby causing the crimping-rollers to revolve rapidly in contact with the can-head flanges. The movement imparted to the crimping-rollers is therefore a combined longitudinal rotative and angular movement, and the head-flanges are thereby forced down tightly on the body throughout their width. The final pressure exerted on the flanges is by the inner ends of the rollers on the inner margin of the flanges. As this pressure takes place while the rollers are moving bodily inwardly, the operation is similar to a spinning operation.

The plunger-plates remain in contact with the can-heads during the crimping operation and constitute abutments or anvils against which the rollers act when the can-heads are of the form shown in Fig. 15, wherein the plunger-plates fit within the recesses of said heads. When the outer faces of the heads are flat, the plunger-plates engage said flat faces of the heads. After the joints between said head-flanges and the body have been formed in the manner described the cams O and Q act through their connections with the plungers L and the bearings for the crimping-heads to quickly withdraw the crimping-rolls and the plunger-plates from the cans, thereby allowing the cans to fall on the carriage-runway, which is inclined to direct the cans from the machine

Means are provided for truing the cans just before the heads are forced thereon and during the time said cans are engaged with the carrying-head D, so as to insure that the can-heads will properly register with ends of the can-bodies. Said truing operation is made desirable by reason of the fact that the can-bodies are likely to become distorted while passing through the chute or when delivered from the chute to the heading and crimping mechanisms. The truing devices are especially useful when operating with can-heads the flanges of which do not flare, but are disposed generally at right angles to the bodies of the heads, as it is necessary with this type of head to observe considerable accuracy in applying the same to the can-bodies. Said truing means for each of the heading and crimping mechanisms consists of a wing or plate S, having a curved engaging face which

is formed on the same radius as the recesses *d* of the head and the curved inner surfaces of the fingers D^2. The wings or plates S are made of such length as to fill the spaces between the upper ends of the fingers D^2 D^4 and the head, so that the can-bodies will be embraced throughout their entire circumference. As herein shown, said truing-plate is made of the same length as the gripping-fingers, each embracing one-fourth part of a circle.

The truing-plates are actuated by the following mechanism: S′ S′ designate arms, which are rigidly affixed to horizontal rock-shafts S^2, which are mounted in the upper ends of vertical supports S^3, attached to the side of the frame-plate. As herein shown, said arms are affixed to the shafts by means of set-screws *s*, which extend through hubs on said arms and impinge upon said shafts. The inner ends of said arms are pivoted to the truing-plates, each plate being provided on its upper face with laterally-separated lugs *s′*, between which the inner ends of the arms fit and with which they are connected by means of pivot-pins s^2. The connections thus provided are sufficiently free to permit the plates to adjust themselves to the can-bodies when pressed thereagainst, while being rigid enough to hold the plates from dropping downwardly when retracted. Said plates are swung inwardly against the can-bodies at the proper time by means of arms s^4, which are rigidly attached at their upper ends to the shafts s^2 and are connected at their lower ends with cam-yokes s^5. Said cam-yokes are provided with cam-studs s^4, which engage cam-grooves s^5 in the opposite sides of a cam S^6, affixed to the shaft C^5. The cam-grooves s^5 are so disposed with respect to each other that in each rotation of the cam the truing plates or wings are alternately actuated.

The operation of the machine described will be obvious from the foregoing, but may be briefly recapitulated as follows: The can heads and bodies are fed set by set to the chute E. During a portion of the operation of the machine the head D is located centrally of its path of travel with the central part thereof beneath the chute, so that at this time the can-body and the heads rest upon the upper margins of the web D′ and the side frames D^3. During the time the carriage occupies such central position the cam-stud c^3 of the cam-yoke C^3, by which the carriage is given motion, is traversing the concentric portion 1 of the cam-groove c^4. In the further rotation of the cam c^4 the cam-stud c^3 enters the eccentric portion 2 of the groove, and while said stud is passing through this portion of the groove the carriage moves toward one of the heading and crimping mechanisms to carry thereto a set of can members which had previously been delivered to one end of the carriage. The cam-stud c^3 after traversing the part 2 of the cam-groove c^4 enters the concentric part 3 of the cam-groove, and during the traverse of the cam-stud through this part of the groove the carriage and head are brought to a rest in position to deliver the can members carried thereby to the heading and crimping mechanisms. While the carriage is traveling toward said heading and crimping mechanism and just before the rear end of the carriage with respect to its direction of travel is brought to register with the chute E one of the actuating-arms H^2 of the rock-shaft H is brought into contact with one of the cam projections K, which causes the fingers D^4 D^2 to be thrown upwardly into the position indicated in Fig. 3 to prevent a set of can members from falling out of the head after being delivered thereto. Thereafter a set of can members is delivered to this end of the carriage, and one of the plungers I is elevated by the mechanism described and acts on its associated rock-shaft-actuating arm H^2 to fully close the fingers D^2 D^4, the latch G^3 acting to lock said plungers in their closed positions. After the forward end of the carriage-head reaches one of the heading and crimping mechanisms and is centered with respect thereto the associated truing-plate is depressed to true the can-body, and thereafter the plunger-plates of the heading mechanism are advanced by their cams O and engage the can-heads and force the same over the ends of the can-body while the fingers D^2 D^4 are yet engaged therewith. After said plunger-plates have forced said can-heads on the can-body one of the plungers J is elevated into contact with the pin G^4 of the latch G^3, thereby serving to release said latch from the associated plunger cross-bar or yoke and permit the fingers D^2 D^4 associated with the can members just delivered to the heading and crimping mechanism to be released and to fall downwardly into the position shown in the Figs. 4 and 5. The truing operation, the heading operation, and the releasing of the fingers occur while the cam-stud c^3 is passing through the concentric part 3 of the cam-groove c^4. The cam-stud after passing through the part 3 of said groove enters an eccentric portion 4 thereof, made like the part 2 of said groove, which causes said carriage to be sharply retracted to its central position beneath the chute E. Said carriage is held in this position while the cam-stud c^3 travels the concentric part 5 of the cam groove (which corresponds with the part 1, before described) and until said cam-stud enters the eccentric part 6 of said groove. The passage of said cam-stud through the said eccentric part 6 causes the carriage to be moved to the opposite heading and crimping mechanism for the purpose of delivering the set of can members carried by the forward end of the head to said mechanism. The cam-stud c^3 passes from said eccentric portion 6 of the cam-groove to the concentric portion 7, and while traversing the latter portion the truing mechanism adjacent to said head is operated, the fingers released, and the plunger-plates moved inwardly to force the can-heads upon the

body thereof. Said cam-stud thereafter traverses the eccentric portion 8 of the cam-groove c^4 corresponding with the parts 2, 4, and 6, which causes the sharp retraction of the carriage to its central position.

The foregoing constitutes one complete cycle of operation of the machine, and it is understood, of course, that said cycles are repeated so long as the operation of the machine continues. It will be understood, of course, that during the time the carriage is delivering the last set of can members referred to to the heading and crimping mechanism at one side of the machine the opposite end of the carriage is receiving another set from the chute to be delivered to the opposite heading and crimping mechanism in the next movement of the carriage. The carriage is arrested in its central position beneath the chute during the times the cam-stud c^3 is traversing the concentric portions 1 and 5 of the cam-groove c^4 in order to give ample time for the crimping-rollers to act upon the head-flanges.

It will be seen from the foregoing that during one rotation of the cam c^4 the carriage travels from its central position to one of the mechanisms to deliver a set of can members thereto, receives another set of can members from the chute, delivers the same to the heading and crimping mechanism on the opposite side of the machine, and returns to its central position. In this manner we are enabled to deliver the sets of can members to the two sets of heading and crimping mechanisms so rapidly as to maintain said mechanisms in a practically continuous operation and therefore are enabled to greatly increase the capacity of the machine as compared with a machine having but a single heading and crimping mechanism. Obviously if the machine be operated at the same capacity as a single machine the parts thereof may be run considerably slower, thereby greatly saving the wear and tear upon the operative parts of the machine.

It is obvious that many changes may be made in the structural details of the machine shown without departing from the spirit of our invention, and we do not wish to be limited to such details except as hereinafter made the subject of specific claims.

We claim as our invention—

1. A machine for the purpose set forth comprising in combination with a frame two sets of mechanisms fixed stationary on said frame for connecting can-heads with the bodies thereof, and a carriage reciprocating between and alternately delivering can members set by set to said mechanisms.

2. A machine for the purpose set forth comprising in combination with a frame two sets of mechanisms fixed stationary on said frame for connecting can-heads with the bodies thereof, a feed-chute located between said mechanisms, and a carriage reciprocating between said mechanisms and receiving can members set by set from said chute and delivering the same alternately to said mechanisms.

3. A machine for the purpose set forth comprising in combination with a frame two sets of mechanisms fixed stationary on said frame for connecting can-heads with the bodies thereof, a feed-chute located between said mechanisms, and a carriage reciprocating between said mechanisms and receiving can members set by set from said chute and delivering the same alternately to said mechanisms, said carriage being so arranged, with respect to the chute, that when in position to deliver a set of can members to one mechanism, it is in position to receive a like set of can members from the feed-chute.

4. A machine for the purpose set forth, comprising, in combination with a frame, two mechanisms fixed stationary on said frame for connecting can-heads with the bodies thereof, a feed-chute located between said mechanisms and a carriage reciprocating between said mechanisms beneath the chute and receiving can members set by set from said chute and delivering them alternately to said mechanisms and means for arresting the carriage in the middle of its throw beneath the chute in a manner to seal the lower end of the chute.

5. A machine for the purpose set forth comprising two sets of mechanisms for connecting can-heads with the bodies thereof, and a carriage reciprocating between said mechanisms and having a head adapted to alternately deliver can members set by set to said mechanisms, said head being provided at its opposite ends with recesses adapted to receive the can members and pivoted retaining-fingers coöperating with said recesses for holding the cans therein.

6. A machine for the purpose set forth comprising two sets of mechanisms for connecting can-heads with the bodies thereof, and a carriage reciprocating between said mechanisms and having a head adapted to alternately deliver can members set by set to said mechanisms, said head being provided at its opposite ends with recesses adapted to receive the can members, pivoted retaining-fingers coöperating with said recesses for holding the can therein, and means permitting said retaining-fingers to swing downwardly to release the can members when the carriage is in position to deliver said can members to each of the mechanisms.

7. A machine for the purpose set forth comprising two sets of mechanisms for connecting can-heads with the bodies thereof, a feed-chute located between said mechanisms, a carriage reciprocating beneath said feed-chute from one mechanism to the other and having a head adapted to receive can members set by set from the chute and deliver the same alternately to said mechanisms, said carriage-head being provided at its opposite ends with recesses to receive the can members, retain-

ing-fingers pivoted to the heads for holding the can members in said recesses, means for closing said fingers after a set of can members has been delivered to said head, and means for opening the fingers after a set of can members has been delivered to one of said mechanisms.

8. A machine for the purpose set forth comprising two sets of mechanisms for connecting can-heads with the bodies thereof, a feed-chute located between said mechanisms, a traveling carriage reciprocating between said mechanisms and provided with a head which travels beneath and seals said chute at the middle of its throw, said head being provided at its opposite ends with recesses to which the can members are delivered set by set from said chute and from which said can members are delivered to said mechanisms, fingers pivoted to said head and coöperating with said recesses to hold the can members therein until released to said mechanisms, and means causing said carriage to stop at the middle of its throw after a set of can members has been delivered to one of the mechanisms.

9. A machine for the purpose set forth comprising a mechanism for connecting can-heads with the bodies thereof, a feed-chute, a carriage which reciprocates from said feed-chute to said mechanism and having a head provided with a recess adapted to receive the can members set by set from said chute to carry the same to said mechanism, retaining-fingers pivoted to said head for holding said can members in said recess, and means for partially raising said fingers just prior to the reception by said recess of said can members.

10. A machine for the purpose set forth comprising two sets of mechanisms for connecting can-heads with the bodies thereof, a feed-chute located between said mechanisms, a carriage adapted to reciprocate between said mechanisms and provided with a head which travels beneath said feed-chute, recesses in the opposite ends of said head adapted to receive can members set by set from said chute, retaining-fingers pivoted to said head to hold the can members in said recesses, and means for partially raising said fingers just prior to the introduction of said can members to the recesses.

11. A machine for the purpose set forth comprising a mechanism for connecting can-heads with the bodies thereof, a feed-chute, a carriage for delivering can members set by set from said feed-chute to said mechanisms, said carriage being provided with a head having at one end a recess adapted to receive the can members set by set from said chute, retaining-fingers pivoted to the opposite ends of said heads and coöperating with the recesses to hold the cans therein, and means for actuating said fingers comprising a plurality of plungers which engage at one end thereof lugs on said fingers and are connected at their other ends with a cross-bar or yoke, a rock-shaft provided with a rock-arm adapted to engage said cross-bar or yoke, an actuating-arm on said rock-shaft and means for raising said actuating-arm.

12. A machine for the purpose set forth comprising two sets of mechanisms for connecting can-heads with the bodies thereof, a feed-chute located between said mechanisms, a carriage reciprocating below said chute and between said mechanisms for delivering the can members set by set from the feed-chute to the mechanisms, means at each end of the carriage for locking said can members on said carriage and operated to release said members when moved into alinement with said mechanisms, and a common actuating device for said locking means.

13. A machine for the purpose set forth comprising two sets of mechanisms for connecting can-heads with the bodies thereof, a feed-chute located between said heads, a carriage reciprocating between said mechanisms and provided with a head which passes below said chute, recesses in said chute adapted to receive the can members set by set and to deliver the same to said mechanisms, retaining-fingers pivoted to the opposite ends of said head and coöperating with said recesses to hold the can members therein, and a common actuating device acting to alternately close said fingers.

14. A machine for the purpose set forth comprising two sets of mechanisms for connecting can-heads with the bodies thereof, a feed-chute located between said heads, a carriage reciprocating between said mechanisms and provided with a head which passes below said chute, recesses in said head adapted to receive from the chute the can members set by set and to deliver the same to said mechanisms, retaining-fingers pivoted to the opposite ends of said head and coöperating with said recesses to hold the can members therein, a common actuating device acting to alternately close said fingers comprising two sets of horizontally-movable plungers, one associated with each set of retaining-fingers, a rock-shaft provided with a rock-arm located between said sets of plungers, oppositely-extending actuating-arms on said rock-shafts and means located on opposite sides of the chute adapted for engagement with said actuating-arms in a manner to throw said rock-arm alternately toward said sets of plungers.

15. A machine for the purpose set forth comprising two sets of mechanisms adapted for connecting can-heads with the bodies thereof, a feed-chute located between said mechanisms, a carriage reciprocating between said mechanisms and provided with a head which is adapted to pass under said feed-chute, recesses in the opposite ends of said head for receiving from the chute the can members set by set, fingers pivoted to said head and coöperating with said recesses to hold the can members therein, a common actuating device acting to alternately close said fingers, comprising two sets of reciprocating plungers,

each set connected at the adjacent ends of the sets by a cross-bar or yoke, and the plungers being adapted for contact at their ends remote from the cross-bars or yokes with lugs on said fingers, a rock-shaft, a rock-arm on said shaft located between said-cross-bars or yokes, and oppositely-directed actuating-arms on said rock-shaft adapted for alternate engagement with reciprocating plungers located on opposite sides of the feed-chute.

16. A machine for the purpose set forth comprising two sets of mechanisms for connecting can-heads with the bodies thereof, a feed-chute located between said mechanisms, a carriage reciprocating from one mechanism to the other and provided with a head which passes beneath said feed-chute, recesses in the opposite ends of said heads for receiving the can members from the chute set by set, retaining-fingers pivoted to the opposite ends of the heads and coöperating with said recesses to hold the can members therein, means for alternately swinging the fingers at the opposite ends of the head into their closed positions comprising two sets of oppositely-acting plungers, each adapted to engage at their outer ends lugs on said fingers, cross-bars or yokes on the inner ends of said plungers, a rock-shaft provided with a rock-arm which is located between said cross-bars or yokes, actuating-arms on said rock-shaft, means on the machine-frame for rocking said shaft and locking-latches adapted to engage projections on the cross-bars or yokes to lock the plungers in their forward positions and the retaining-fingers closed.

17. A machine for the purpose set forth comprising two sets of mechanisms for connecting can-heads with the bodies thereof, a feed-chute located between said mechanisms, a carriage reciprocating from one mechanism to the other and provided with a head which passes beneath said feed-chute, recesses in the opposite ends of said heads for receiving the can members from the chute set by set, retaining-fingers pivoted to the opposite ends of the heads and coöperating with said recesses to hold the can members therein, means for swinging said fingers into their closed positions comprising two sets of oppositely-acting plungers, each adapted to engage at their outer ends lugs on said fingers, cross-bars or yokes on the inner ends of said plungers, a rock-shaft provided with a rock-arm which is located between said cross-bars or yokes, actuating-arms on said rock-shaft, means on the machine-frame for engaging said arms to rock said shaft, locking-latches adapted to engage projections on the cross-bars or yokes to lock the plungers in their forward positions and the retaining-fingers closed, and means located at the ends of the carriage travel for releasing said locking-latches.

18. A machine for the purpose set forth comprising a mechanism for connecting can-heads with the bodies thereof, a feed-chute, a carriage for carrying the can members set by set from said chute to the said mechanism, said carriage having a head provided with a recess in the end thereof for receiving said can members, fingers pivoted to said carriage and coöperating with the recess to hold the can members therein, means for locking said fingers in their closed positions to hold a set of can members in said recess, and means for partially closing said fingers just before a set of can members are delivered thereto.

19. A machine for the purpose set forth comprising a mechanism for connecting can-heads with the bodies thereof, a feed-chute, a carriage reciprocating between said feed-chute and said mechanism, and provided with a head which passes beneath said chute, said head being provided with a recess adapted to receive said can members set by set and to deliver the same to said mechanism, retaining-fingers pivoted to said head and cooperating with said recess to hold the can members therein, reciprocating plungers engaging at their ends lugs on said fingers and connected at their opposite ends with a cross-bar or yoke, a rock-shaft provided with a rock-arm adapted to engage said cross-bar or yoke, an actuating-arm on said rock-shaft, a plunger adapted to raise said actuating-arm, and a cam projection on the machine-frame in advance of the said plunger.

20. A machine for the purpose set forth comprising two sets of mechanisms for connecting can-heads with the bodies thereof, a feed-chute located between said mechanisms, a carriage provided with a head which travels beneath said feed-chute, said head being provided at its ends with recesses which receive said can members from the chute set by set and deliver the same to said mechanisms, fingers pivoted to said heads and coöperating with said recesses for holding the can members therein, two sets of plungers, each adapted to engage at their remote ends lugs on said fingers, the plungers of each set being connected at the adjacent ends of the sets with cross-bars or yokes, a rock-shaft provided with a rock-arm located between said cross-bars or yokes, actuating-arms connected with said rock-shaft, reciprocating plungers in the machine-frame on opposite sides of the chute adapted to engage said actuating-arms and thereby actuate the plungers to close said retaining-fingers, means for locking said fingers closed and cam projections located on the machine-frame just inside of said plungers.

21. A machine for the purpose set forth comprising mechanism for connecting can-heads with the bodies thereof, a carriage provided with a head which reciprocates beneath said chute, said head being provided with a recess for receiving said can members set by set from the chute and delivering the same to said mechanism, fingers pivoted to said head and coöperating with the recess to hold the cans therein, means for raising said fingers into their closed positions comprising endwise-

reciprocating plungers engaging lugs on said fingers, means for reciprocating said plungers endwise, a latch for holding said plungers in their advanced positions in a manner to hold said fingers closed, and a reciprocating plunger adapted to act on said latch when the head is in position to deliver a set of can members to said mechanism in a manner to release said fingers.

22. A machine for the purpose set forth comprising a mechanism for connecting can-heads with the bodies thereof, a feed-chute provided with a central runway for the can-bodies and two side runways for the can-heads, a carriage for delivering the can members set by set from said chute to said mechanism provided with a head which passes beneath the runways for the can-bodies and with side parts which pass through the lower ends of said runways for the can-heads, said head and side parts being provided with horizontal recesses to receive the can members from said chute, and retaining-fingers pivoted to said head and adapted to hold said can members in said recesses.

23. A machine for the purpose set forth comprising a mechanism for connecting can-heads with the bodies thereof, a feed-chute, a carriage provided with a head adapted to deliver can members set by set from said chute to said mechanism, means for retaining said can members engaged with said head and adapted to release the said members when brought into line with said mechanism, and a truing device engaging the can-body just before it is released from said head.

24. A machine for the purpose set forth comprising two sets of mechanisms for connecting can-heads with the bodies thereof, a feed-chute located between said mechanisms, a carriage provided with a head adapted for delivering can members set by set from said feed-chute alternately to said mechanisms, means for retaining said can members engaged with said head and adapted to release said members when brought into line with said mechanism, truing devices adapted to engage the can-bodies just before they are released from said head and means acting alternately on said truing devices to engage the same with the can-bodies at the time the sets of can members are delivered to said mechanisms.

25. A machine for the purpose set forth comprising a mechanism for connecting can-heads with the bodies thereof, a feed-chute, a carriage provided with a head reciprocating beneath said chute and having at its end a recess adapted to receive said can members set by set from the chute and deliver the same to said mechanism, retaining-fingers pivoted to said head and coöperating with said recess to hold a set of can members therein and a truing-plate adapted to engage the can-body between said carriage-head and the fingers when the can members are brought into line with said mechanism, said truing-plates being made of a length to extend substantially from the ends of the fingers to said head-recess.

26. A machine for the purpose set forth comprising a frame, a rotary shaft journaled in said frame, two sets of mechanisms located on each side of the frame-plate for connecting can-heads with the bodies thereof, a feed-chute located between said mechanisms, a carriage reciprocating on said frame between said mechanisms and provided with a head which passes beneath the chute, said head having at its opposite ends recesses to receive the can members set by set, and to deliver the same to said mechanisms, retaining-fingers pivoted to said head and coöperating with said recesses to hold the can members therein, and two truing-plates, one associated with each mechanism, one adapted to be pressed downwardly on the can-body each time a set of can members is delivered to its associated mechanism, and a cam on said shaft operatively connected with both of said truing-plates and adapted to alternately actuate the same.

27. A machine for the purpose set forth comprising, in combination with a frame, two sets of mechanisms fixed stationary on said frame for connecting the heads with the bodies thereof, a carriage reciprocating on said frame between and alternately delivering can members set by set to said mechanisms, mechanism for actuating said carriage, stops on the carriage and frame for arresting the carriage at each limit of its travel in line with said head-connecting mechanisms, respectively, and yielding connections between the carriage and its actuating mechanism permitting movement of the latter after the carriage has been arrested.

28. A machine for the purpose set forth comprising a frame, a rotative shaft journaled in hangers beneath said plate, mechanism for connecting can-heads with the bodies thereof, a carriage which travels in ways or guides in said frame, a cam on said rotative shaft, a carriage-actuating lever operatively connected at one end with said cam and at its other end with said carriage, an adjustable stop on the frame-plate for limiting the travel of the carriage, and yielding connections between said carriage-actuating lever and the carriage.

29. A machine for the purpose set forth comprising a frame, a rotative shaft journaled in said frame, mechanism for connecting can-heads with the bodies thereof, a carriage which travels in ways or guides on said frame for delivering can members set by set to said mechanism, an adjustable stop for limiting the travel of said carriage, a cam on said rotative shaft, a cam-yoke provided with a stud which engages a cam-groove in said cam, a carriage-actuating lever which is connected at its upper end with said carriage and pivoted at its lower end on a shaft parallel with said rotative shaft, an arm rigid with the lower end of said carriage-actuating arm to which the cam-yoke is pivotally connected, and ad-

justable connections between said cam-yoke and the arm for varying the throw of said cam-actuating lever.

30. A machine for the purpose set forth comprising a frame, a rotative shaft journaled in said frame, mechanism for connecting can-heads with the bodies thereof, a carriage which travels in ways or guides on the frame for delivering can members set by set to said mechanism, an adjustable stop for limiting the travel of said carriage, a cam on said rotative shaft, a cam-yoke provided with a stud which engages a cam-groove in said cam, a carriage-actuating lever which is connected at its upper end with said carriage and pivoted at its lower end on a shaft parallel with said rotative shaft, an arm rigid with the lower end of said carriage-actuating arm to which the cam-yoke is pivotally connected, adjustable connections between said cam-yoke and arm for varying the throw of said carriage-actuating lever, and yielding connections between the upper end of said carriage-actuating lever and the carriage.

31. A machine for the purpose set forth comprising a frame, two sets of mechanisms, one located on each side of the frame for connecting can-heads with the bodies thereof, a carriage which travels in ways or guides on the frame for alternately delivering can members set by set to said mechanisms, a cam on said rotative shaft, a carriage-actuating lever which is operatively connected at its lower end with said cam and at its upper end with said carriage, adjustable stops on said frame adapted to limit the travel of the carriage in either direction, and yielding connections between said lever and said carriage which permit the lever to yield with respect to the carriage at both limits of its travel.

In testimony that we claim the foregoing as our invention we affix our signatures, in presence of two witnesses, this 20th day of June, A. D. 1902.

CHARLES STECHER.
PETER FULFORD.

Witnesses:
DAVID A. FITZGIBBON,
JNO. M. GLEASON.