(No Model.)

4 Sheets—Sheet 1.

C. W. SLEEPER.

MACHINE FOR HEADING CANS.

No. 474,534. Patented May 10, 1892.

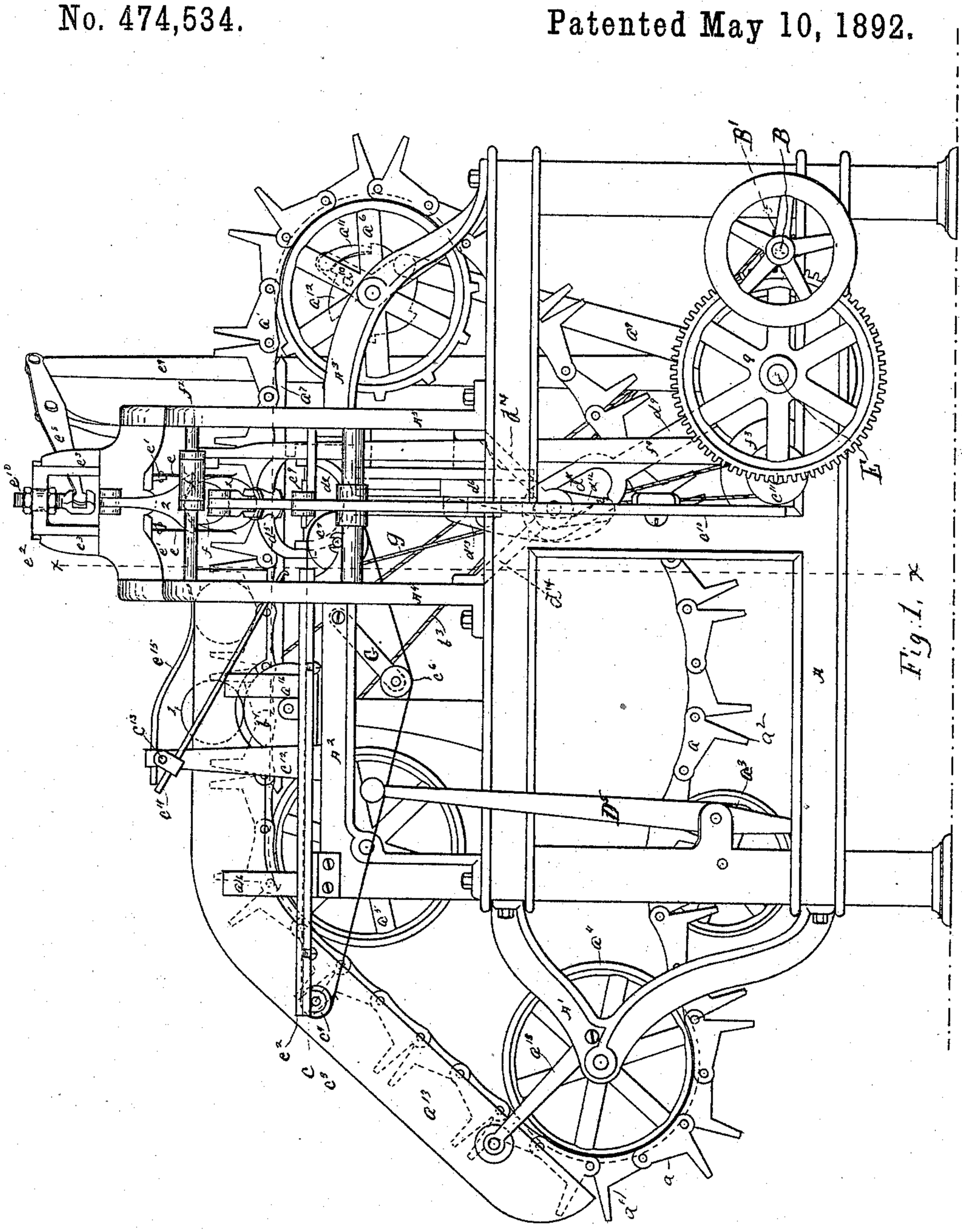

Fig. 1.

Witnesses.
Allan Ingle
Chas Willoughby

Inventor.
Chas. W. Sleeper.

(No Model.)

4 Sheets—Sheet 2.

C. W. SLEEPER.

MACHINE FOR HEADING CANS.

No. 474,534. Patented May 10, 1892.

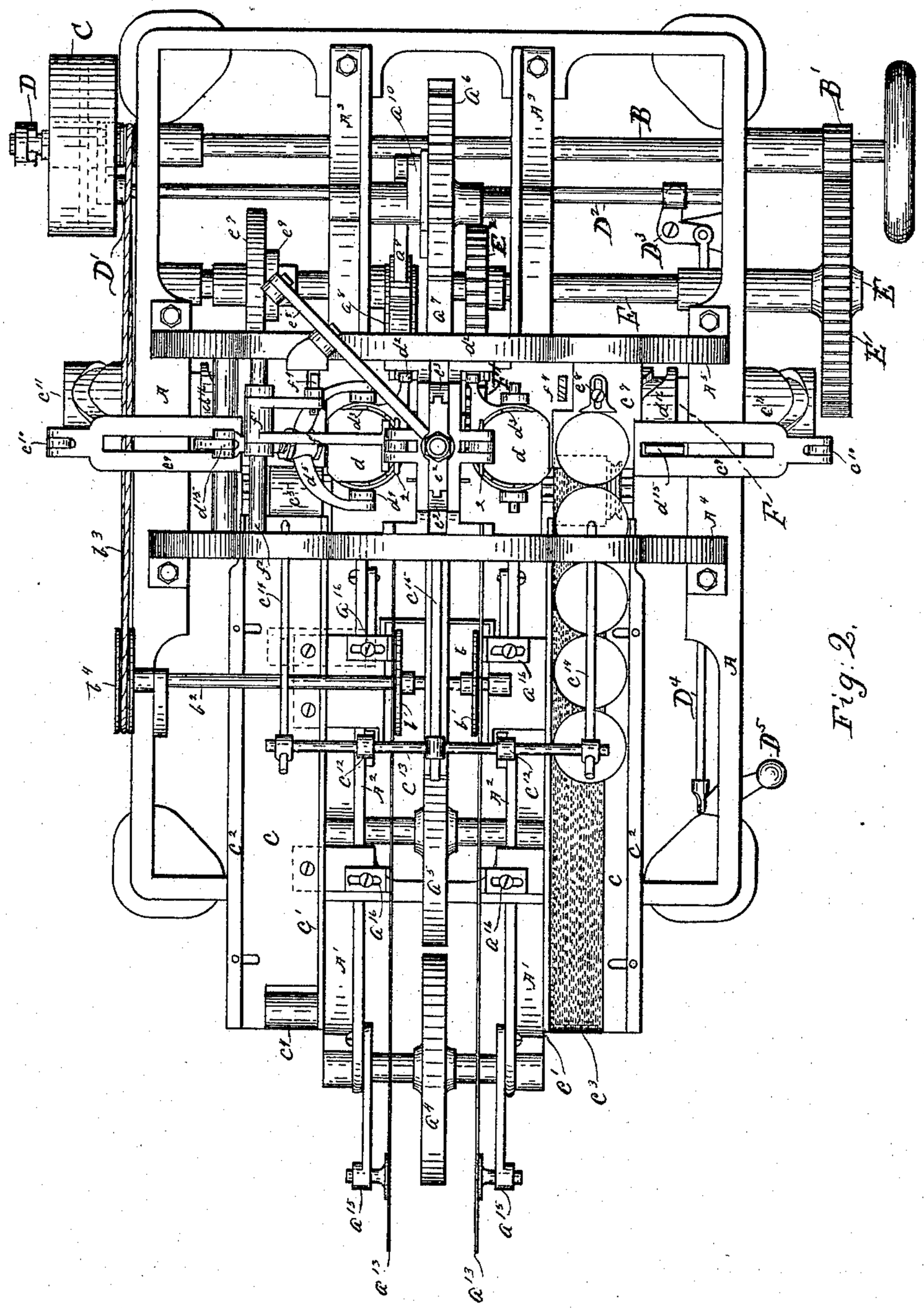

Fig. 2.

Witnesses.
Allan Smyth
Chas Hillonghby

Inventor.
Chas W. Sleeper.

(No Model.) 4 Sheets—Sheet 3.

C. W. SLEEPER.

MACHINE FOR HEADING CANS.

No. 474,534. Patented May 10, 1892.

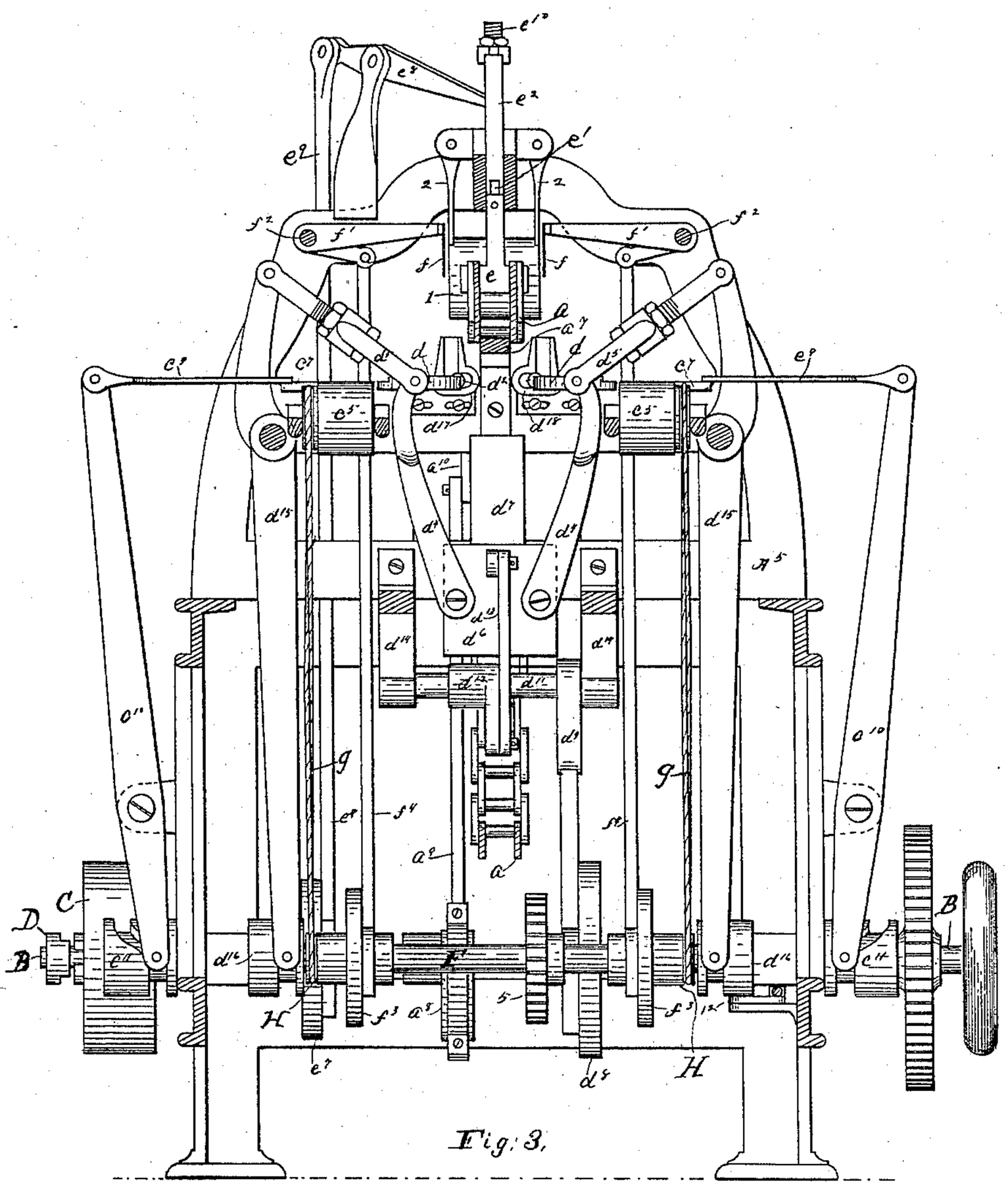

Fig. 3.

Witnesses.
Allan Moyle
Chas Hillonghby

Inventor.
Chas W. Sleeper,

(No Model.) 4 Sheets—Sheet 4.

C. W. SLEEPER.

MACHINE FOR HEADING CANS.

No. 474,534. Patented May 10, 1892.

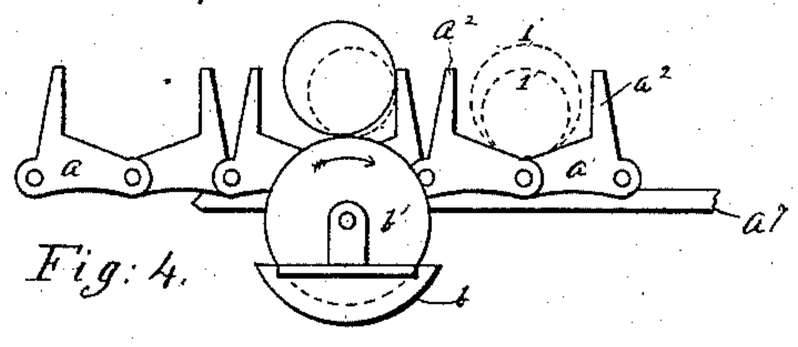

Fig. 4.

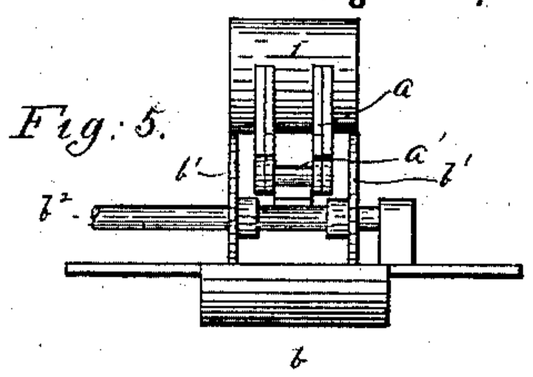

Fig. 5.

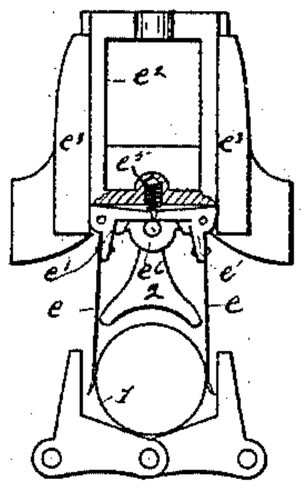

Fig. 6.

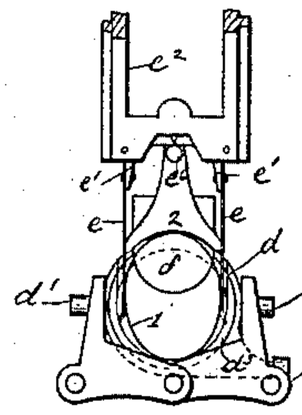

Fig. 7.

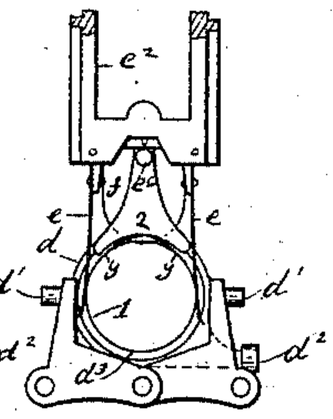

Fig. 8.

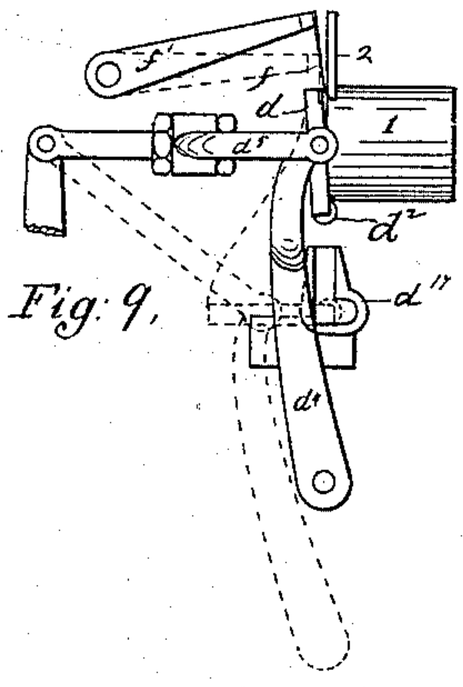

Fig. 9.

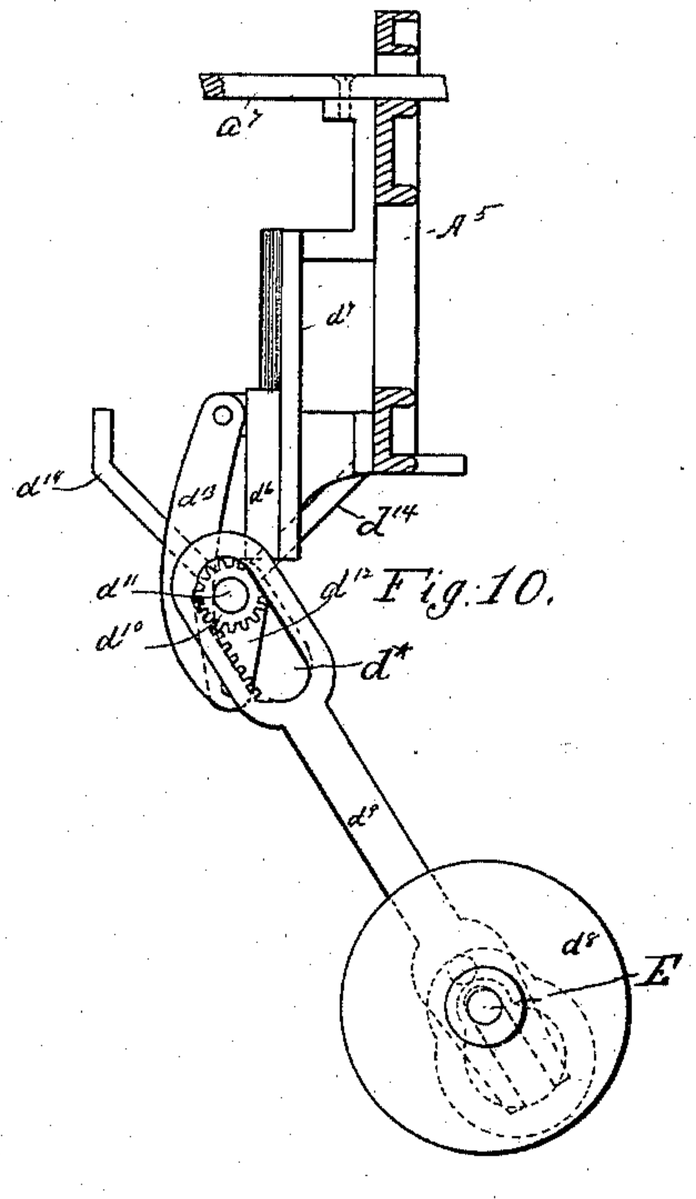

Fig. 10.

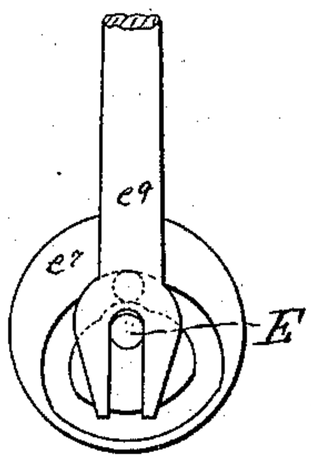

Fig. 11.

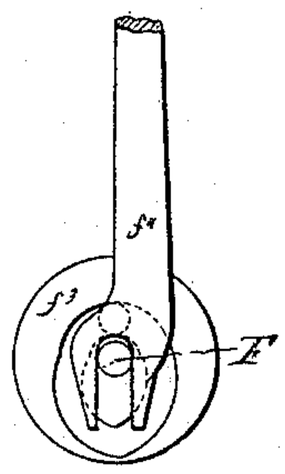

Fig. 12.

Witnesses,
Allan Boyle
Chas Hillenghby

Inventor,
Chas W. Sleeper.

UNITED STATES PATENT OFFICE.

CHARLES W. SLEEPER, OF ISLAND POND, VERMONT, ASSIGNOR TO THE SLEEPER MACHINE COMPANY, OF MAINE.

MACHINE FOR HEADING CANS.

SPECIFICATION forming part of Letters Patent No. 474,534, dated May 10, 1892.

Application filed November 7, 1891. Serial No. 411,176. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. SLEEPER, of Island Pond, in the county of Essex and State of Vermont, have invented a new and useful Improvement in Machines for Heading Cans, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to machines for heading cans, and is designed as a further improvement on my patent, No. 412,552, dated October 8, 1889.

My invention consists generally in improved mechanism for feeding the cans and heads, fluxing the cans, and attaching the heads to the cans, all as more particularly hereinafter described.

In the accompanying drawings, Figure 1 illustrates a side elevation of a machine embodying my invention. Fig. 2 is a plan of the same with the can-feeding mechanism and certain other parts of the machine removed. Fig. 3 is a vertical transverse section taken on the line *x x* of Fig. 1. Figs. 4 to 12, inclusive, are details.

Similar letters and numerals represent like parts in all the figures.

A is the frame of the machine.

B is a horizontal shaft supported loosely in bearings in and across the lower portion of the same and near one end and extending outward on both sides of the frame. C is the driving-pulley loosely journaled to said shaft near one of its ends and outside the frame A, and said shaft and pulley are provided with clutch mechanism D, whereby the shaft and pulley may be clutched and held together. The pulley C is provided with a groove (not shown) on its inner face in which a "shipper" D′ enters. Said shipper is secured to one end of a rod D^2, which extends across the machine, and to this rod, near its opposite end, is attached one arm of a bell-crank lever D^3, (pivoted to the frame A,) the opposite arm of said lever being attached to a rod or link D^4, to which rod or link is pivoted a hand-lever D^5, which is fulcrumed on the side of the frame A. By operating said lever D^5 the shipper D′ is slid back and forth, as also the pulley C, and the clutching and unclutching of said pulley to the shaft B are thus controlled.

E and F are two horizontal shafts supported in bearings in the frame A and parallel with the shaft B. The shaft E derives its motion from the driving-shaft B by means of a gear E′ on the shaft E engaging with a pinion B′ on the shaft B. The shaft F derives its motion from a gear F′ on said shaft engaging with a similar gear E^2 on the shaft E.

The mechanism for conveying the can-bodies to the heading mechanism is the following: an endless chain composed of links *a a*, (best shown in Figs. 4 and 5,) which are connected in pairs by pins *a′* and are provided with projections a^2, between which the can-bodies are adapted to be held and pushed along. The links of each pair slope downward from the projections a^2 to their point of connection, so that a can-body of any size placed upon said links will roll down and assume a central position between the projections a^2 a^2, as shown by the dotted lines 1 1 in Fig. 4. The chain passes around suitable carrier-wheels a^4 a^5 and a sprocket-wheel a^6 and over the wheel a^3, the wheels a^4, a^5, and a^6 being supported by suitable shafts having bearing in the hangers A′ A^2 A^3. The wheel a^3 is also supported by a shaft working in bearings in frame A, but below the other wheels just mentioned, and serves to support the lower portion of the chain and to keep it from dragging. A horizontal bar or rest a^7 supports the upper portion of the chain between the wheels a^5 and a^6. An intermittent motion is given to the chain by an eccentric a^8, which is keyed to the shaft E and which is connected by an eccentric-rod a^9 to one arm of a bell-crank lever a^{10}, which is loosely pivoted upon the shaft of the sprocket-wheel a^6. The opposite arm of said lever a^{10} carries a pawl a^{11}, which engages a ratchet a^{12}, keyed upon the face of the wheel a^6. Guide-walls a^{13} a^{13}, supported by hangers a^{15} a^{15} and adjustable standards a^{16} a^{16} a^{16} a^{16}, serve to keep the bodies in proper position upon the chain.

The devices for fluxing the can-bodies are situated in the upper portion of the machine and are as follows: A pan *b*, which contains the liquid flux, is suspended by hangers un-

der the bar a^7. Two disks b' b', which are fixed upon a horizontal shaft b^2, dip into said pan. The shaft b^2 is driven by a belt b^3, which passes over a pulley b^4, fixed to said shaft and over another pulley B^2, fixed to the driving-shaft B. The disks b' b' are adapted by their revolutions to bring up sufficient of the flux from the pan to flux the ends of the can-bodies as they roll upon said disks.

The devices for conveying the can-heads to the mechanism for attaching them to the bodies are the following: c c are two horizontal tables extending longitudinally with the machine and parallel with the chain-supporting bar a^7 and situated on either side of said bar and the disks b' b' and some distance from the same. Each of these tables c is provided with a stationary raised side c', extending upward from its inner edge, and a laterally-adjustable wall c^2, extending upward from near its outer edge. The objects of these walls c' c^2 are to retain the can-heads between them and to adjust the distance between the same to correspond to the diameters of different sizes of heads. c^3 c^3 are two endless belts or aprons, one passing over each of the tables c c and around pulleys c^4 c^5, which are loosely journaled in hangers at either end of said tables, and with the upper portions of their perimeters near the surfaces of the tables. Adjustable hangers or arms G G, screwed to the cross-bars A^2 A^2 of the frame, each having a tension-pulley c^6 on its lower end, bear down upon the belts c^3 and serve to keep them taut. Each of the pulleys c^5 c^5 is grooved near its outer end to retain a belt g, which passes around said pulley and also around a pulley H, both of said pulleys H being secured to the shaft F, and through which shaft the pulleys H, belts g, pulleys c^5, and aprons c^3 all get their rotary motion. c^7 c^7 are two short tables situated beyond the tables c and just beyond the pulleys c^5, but with their upper surfaces on the same plane as those of the tables c. Each of these tables c^7 is provided with a longitudinally-adjustable vertical stop c^8 near its farther end to limit the distance the can-heads are to travel. d d are the chucks or holders for the can-heads when they are ready to be attached to the bodies, and will be hereinafter fully described. These chucks when in their lowermost and horizontal position have their upper surfaces substantially on a plane with the tables c^7, and are situated between these tables and to one side of the same, as shown in Figs. 2 and 3. The stops c^8 are adapted to be adjusted so that the forward can-heads when their edges strike the stops will be directly opposite the openings in the chucks, so as to be readily pushed therein. c^9 c^9 are two horizontal bars having their inner ends resting upon the tables c^7 c^7, near their outer edges, and extending outward from the same, and said bars having a reciprocating motion transverse with the machine, for the purpose of pushing the can-heads into the chucks d d. These bars c^9 c^9 are attached to the upper ends of two cam-levers c^{10} c^{10}, which levers and bars derive their motions from the cams c^{11} c^{11} on the shaft F. c^{12} c^{12} are two standards, in which is loosely journaled a shaft c^{13}, secured to said shaft, and extending toward the heading mechanism and over the tables c c are two rods or fingers c^{14} c^{14}, having their ends hooked downward and adapted to drop by gravity and rest upon said tables. c^{15} is another finger secured to the shaft c^{13} between the fingers c^{14} c^{14}, extending in the same direction and over the can-body-feeding chain and curving upward near its end.

The objects of the fingers c^{14} c^{15} are as follows: When the fingers c^{14} rest upon the tables c they will stop the heads from being fed to the heading mechanism, as the flanges of the heads will come in contact with the hooks of said fingers, and this will happen when the can-bodies are not being fed; but when said bodies are fed along by their chain their convex peripheries will ride under the finger c^{15} and lift said finger so as to turn the shaft c^{13} backward, and thus raise the fingers c^{14}, so as release the heads and allow them to be fed.

The mechanism for attaching the can-heads to the bodies is as follows: The chucks d d for holding the can-heads while they are being attached to the can-bodies are of flat and substantially circular form, in the upper surface of each of which is a circular recess, leaving a flange surrounding the same, except at the side nearest the table c^7, where said flange is cut away, leaving a space slightly wider than the length of the diameter of the largest can-head to be used. An arched ring d^3 is fitted into said recess around and against the flange, leaving an internal area corresponding with that of the can-heads. The chucks d d are provided with trunnions extending outward from either side of the same halfway between the cut-away portion of the chuck and the opposite side, and a lateral projection of the chuck is provided with a guide-roller d^2 on its end. The chucks d d are supported by their trunnions in downwardly-extending carrying-yokes d^4 and upwardly-extending yokes d^5. The lower ends of the carriers d^4 are pivoted to a vertically-sliding block d^6, Figs. 3 and 10, which spans and slides upon the vertical guide d^7. The vertical motion is given to the block d^6 by the following mechanism: A cam d^8 on the shaft E operates a cam-rod d^9, which has a slot d^* in its upper end, said slot being provided with rack-teeth on one side. A pinion d^{10}, secured upon a rock-shaft d^{11}, is inclosed in the slot d^* and engages with the rock in the same, said shaft d^{11} being journaled in the hangers d^{14}, which are suspended from the standards A^4 A^5. (See Figs. 1, 3, and 10.) An arm d^{12} is secured to the rock-shaft d^{11}, and a link d^{13} pivotally connects said arm and the block d^6. The rotation of the cam d^8 raises and lowers the rod d^9, and its rack rotates the pinion d^{10}, which rocks the shaft d^{11}, causing the arm d^{12}

to swing out and in, so as to push up and pull down the link d^{13} and the block d^6. The rising and falling of the block d^6 raises and lowers the carriers d^4 and the chucks d, which are pivoted by their trunnions to said carriers, as also the inner ends of the yokes d^5. The outer ends of the yokes d^5 are pivoted to cam-rods d^{15}, which are horizontally pivoted to the machine-frame, and these cam-rods are given a lateral motion by the cams d^{16} on the shaft F, thus moving in and out laterally the yokes d^5 and the chucks d. d^{17} d^{18} are two right-angled slotted guides, which are adapted to guide the rollers d^2 and the chucks in their lateral and vertical motions above described, and from the position shown in Fig. 3 and by dotted lines in Fig. 9 to that shown by the full lines in Fig. 9, the first-named position being that when the chucks are horizontal and when the can-heads have just entered the chucks, and the last-named position being that when the can-heads have been raised and their attachment to the body almost completed. e e are yielding springs, Figs. 1, 3, 6, 7, and 8, which are connected to the depending arms of two elbow-levers e' e', said levers being pivotally connected at their elbows to a vertically-reciprocating slide e^2, which works in guideways e^3. A small coil-spring e^5, partly inclosed in a recess in the lower end of the slide e^2, bears down upon the lateral arms of the levers e' and tends constantly to separate the depending arms of said levers and their connected springs e e. (See Fig. 6.) e^6 is a horizontal pin which is fixed to the machine-frame in a transverse position and under the adjacent ends of the lateral arms of the two elbow-levers e' e', so that when the slide e^2 and said levers descend the lateral arms of the same will strike against the pin e^6 and said arms will be raised, while the depending arms and the springs e e will come toward each other. The above mechanism is situated above the chain a and between the chucks d, and its object is to bring the yielding springs e e toward each other to grasp the sides of the can-body and press it into an oval shape, so that the heads may be readily attached at the lower portion of the body-edge, and then while said springs are gradually separating to allow the entire edges of the body to enter and fill up the flanges of the heads while the latter are being pressed into position upon the body.

Fig. 6 shows the position of the parts when the slide e^2 is raised and when the gripping-springs e are separated about the width of the can-body 1 by the action of the spring e^5.

Fig. 7 shows the positions of the parts when the gripping-springs e e have been forced toward each other by the action of the pin e^6 on the arms e' e', and when said springs e e have pressed the can-body 1 into an elliptical form at this point the lower portion of the flanges on the heads have just begun to engage with the lower edges of the bodies.

Fig. 8 shows the positions of the parts after the springs e e have been separated by the spring e^5 on the rising of the slide e^2 and when the heads have almost become attached to the body 1. The slide e^2 derives its vertical motion from the cam e^7 on the shaft E, acting upon the lever e^8 through the cam-rod e^9. (See Figs. 1, 2, 3, and 11.)

2 2 are two arms loosely pivoted to the machine-frame above the chain a and the chucks d d and on either side of the slide e^2. Said arms are concaved at their lower edges to correspond with the convex peripheries of the can-bodies and are for the purpose of forming an upper brace or support for said bodies when the heads are being attached. These arms 2 2 are so pivoted as to be adapted to swing freely in a direction transverse with the machine and chain a. (See Figs. 1, 2, 3, 6, 7, 8, and 9.)

f f are flat pieces of metal or other appropriate material, which are suspended from the long arms of the elbow-levers f' f', and when in their lowermost position (see Fig. 3) are a distance apart a little greater than the length of the can and are outside of the arms 2 2. The elbow-levers f' f' are secured to the rock-shafts f^2 f^2, and said levers are raised and lowered by means of the cam f^3 on the shaft F and the connecting cam-rods f^4. The object of the flat pieces f f is to form guards or screens to prevent the heads from engaging with the edges of the can-body until they can do so evenly and uniformly, so as to join them completely.

Figs. 3 and 7 and the dotted lines in Fig. 9 show the lowest positions of the guards f when only the lower portions of the can-body and heads are ready to engage or are engaging, and it will be seen that they form barriers to prevent the heads from coming entirely into contact with the can-body. In the full lines of Fig. 9 and in Fig. 8 the guard f is raised to allow the head to be completely attached to the body.

The operation of the machine is as follows: The chucks d d being in a horizontal position, with their recesses level with the table c^7, (see Fig. 3,) the heads are placed upon the upper horizontal portion of aprons c^3 c^3, with their flanges extending upward, and the can-bodies are placed on the chain a in the position shown in Figs. 1, 4, and 5. The heads are then fed by the aprons c^3 c^3 until the forward one on each side has reached the tables c^7 c^7, where they are stopped by the stops c^8. The heads are then pushed by the feeding-bars c^9 into the recesses of the chucks d d. The conveyer-chain a brings a body into position above the chucks d d and under the swinging arms 2 2, which holds the head in position, and the slide e^2 and grippers e e descend and the latter press the body 1 to elliptical form. (See Fig. 7.) The shields f descend, as shown in Fig. 3. The chucks are then raised, (by the carriers d^5, arms d^4, and block d^6,) turning upon their trunnions as they rise. The flanges of the heads strike the lower part of the body 1 and rest against the shields f, the latter preventing the heads

from entirely engaging with the edges of the body until they can do so uniformly and perfectly. At the positions of the parts shown in Fig. 6 the heads will encircle the body for more than one-half of its circumference, with the shield *f* preventing the upper parts of the head and body from engaging each other. As the chucks *d d* continue to rise, the upper part of the body 1, resting against the slide e^2, rises, thus gradually releasing the elbow-arms *e' e'* from their pressure upon the pin e^6 and allowing the spring e^5 to gradually separate the grippers *e e*, said release of the grippers and the pressure of the can-body on the fingers 2 causing said body to gradually assume a circular form.

In Fig. 8 the heads are shown as encircling the body, except between the points *y y*, and these points are covered by the fingers 2. The chucks continue to rise until the outside of body 1 coincides with the inside of the head, when the shield *f* withdraws and the cams d^{16} cause the chucks *d d* to approach each other and force the flanges of the heads over the body. The chain *a* then carries the headed body beyond the arms 2 2 and the grippers *e e*, and the above-described operation is repeated.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for heading cans, an endless feeding-chain for the can-bodies composed of links pivoted in pairs, said pairs being pivoted to each other and the ends of said links opposite to the pivot connecting the links of each pair being provided with outwardly-projecting arms for holding a can-body between them, in combination with means for intermittently feeding said chain, all as and for the purposes set forth.

2. In a machine for heading cans, the endless feeding-chain for the can-bodies composed of the links *a a*, pivoted in pairs, and said pairs pivoted together and each link of a pair having the projection a^2 and the portion between said projections sloping downward toward the pivotal connection of the two links of each pair, all as and for the purposes set forth.

3. In a machine for heading cans, means for intermittently feeding can-bodies to the heading mechanism, means for feeding the heads on either side of the can-body feeder in planes parallel with said feeder, pivoted chucks arranged on each side of the can-feeder, and means for operating said chuck to attach the heads to the can-bodies, all as and for the purposes set forth.

4. In a machine for heading cans, means for intermittently feeding can-bodies to the heading mechanism, means for feeding the heads along a rest or table on either side of the body-feeder and parallel with the same, the rock-shaft c^{13}, journaled above and transverse with the body-feeder, and the fingers c^{14} c^{15}, secured to said rock-shaft and arranged, as described, all as and for the purposes set forth.

5. In a machine for heading cans, means for intermittently feeding can-bodies to the heading mechanism, in combination with two endless aprons, one arranged on either side of the body-feeder and traveling in the same direction and said aprons extending around pulleys and over a horizontal table, all as and for the purposes set forth.

6. In a machine for heading cans, means for intermittently feeding can-bodies to the heading mechanism, in combination with two endless aprons, one arranged on either side of the body-feeder and traveling in the same direction and said aprons extending around pulleys and over a horizontal table, the rock-shaft c^{13}, journaled above and transverse with the body-feeder, and the fingers c^{14} and c^{15}, secured to said rock-shaft and arranged, as described, all as and for the purposes set forth.

7. The combination, with a support for holding the can-body in a horizontal position on its perimeter, of the two endless feed-aprons c^3, arranged one on each side of said support and having their upper surfaces horizontal, means for revolving said aprons, and means for carrying the heads from said aprons and attaching them to the ends of the body, all as and for the purposes set forth.

8. The combination, with a support for holding the can-body in a horizontal position on its perimeter, of a horizontally-supported feed-apron for can-heads situated on one side of the can-body support, a movable chuck for receiving and carrying said heads into engagement with the can-body and which in its lowest position is on the same plane with the head-support, the feeding-bar c^9, resting on the head-support and adapted to move toward and away from said chuck, lever c^{10}, and cam for operating said lever, all as set forth.

9. The combination, with an endless feeding-chain for the can-bodies, of the two endless aprons c^3 c^3, arranged one on each side of said feeding-chain and traveling in the same direction and having their upper surfaces horizontal, means for revolving said aprons, and means for carrying the heads from said aprons and attaching them to the ends of the body, all as and for the purposes described.

10. The combination, with means for holding the can-body while being headed, of a reciprocating vertical slide arranged above said holder, the elbow-arms *e' e'*, pivoted to the lower portion of said slide, and the gripping-springs *e e*, secured to said arms, the spring e^5, bearing on the upper portion of the arms *e' e'*, and a stationary pin or stud arranged below the upper portion of said arms, all as and for the purposes set forth.

11. The combination, with means for holding the can-body while being headed, of a vertically-movable slide situated above said means and having downwardly-projecting pivoted arms for embracing the can-body, means for drawing said arms together on the downward movement of the slide, and means for sepa-

rating said arms on the upward movement of the slide, all as and for the purposes set forth.

12. The combination, with means for holding the can-body while being headed, of a vertically-movable slide situated above said means and having downwardly-projecting pivoted arms for embracing the can-body, means for drawing said arms together on the downward movement of the slide and for separating said arms on the upward movement of the slide, and the fingers 2, hung above the can-holder, all as and for the purposes set forth.

13. The combination, with means for intermittently feeding can-bodies to the heading mechanism, of the two rotary vertical disks dipping into a pan for holding liquid flux and arranged in the line of feed of the can-bodies and journaled below said line of feed, whereby the can-bodies in the course to be headed may rest and pass over the peripheries of said disks and be fluxed, all as and for the purposes set forth.

14. The combination, with a feeding-chain for conveying can-bodies to be headed, of two rotary disks arranged one on either side of said chain and dipping into a pan for containing liquid flux and journaled below the course of said bodies, whereby the latter may rest and pass over the peripheries of said disks and be fluxed, all as and for the purposes set forth.

15. In combination with the vertical slide d^6, the arms or yokes d^4 d^4, pivoted horizontally to said slide, the chucks journaled by trunnions to said arms, pinion d^{10} and its shaft, arm d^{12}, secured to said shaft, link d^{13}, pivoted at one end to said arm and at its other end to slide d^6, a cam-rod provided with a rack for engaging with said pinion, and a cam for operating said cam-rod, all as and for the purposes set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 11th day of August, A. D. 1891.

CHARLES W. SLEEPER.

Witnesses:

CHAS. M. REED,

NATHAN H. DANIELS.