(No Model.) 5 Sheets—Sheet 1.

M. A. WHEATON.

CAN HEADING MACHINE.

No. 477,584. Patented June 21, 1892.

Fig. 1.

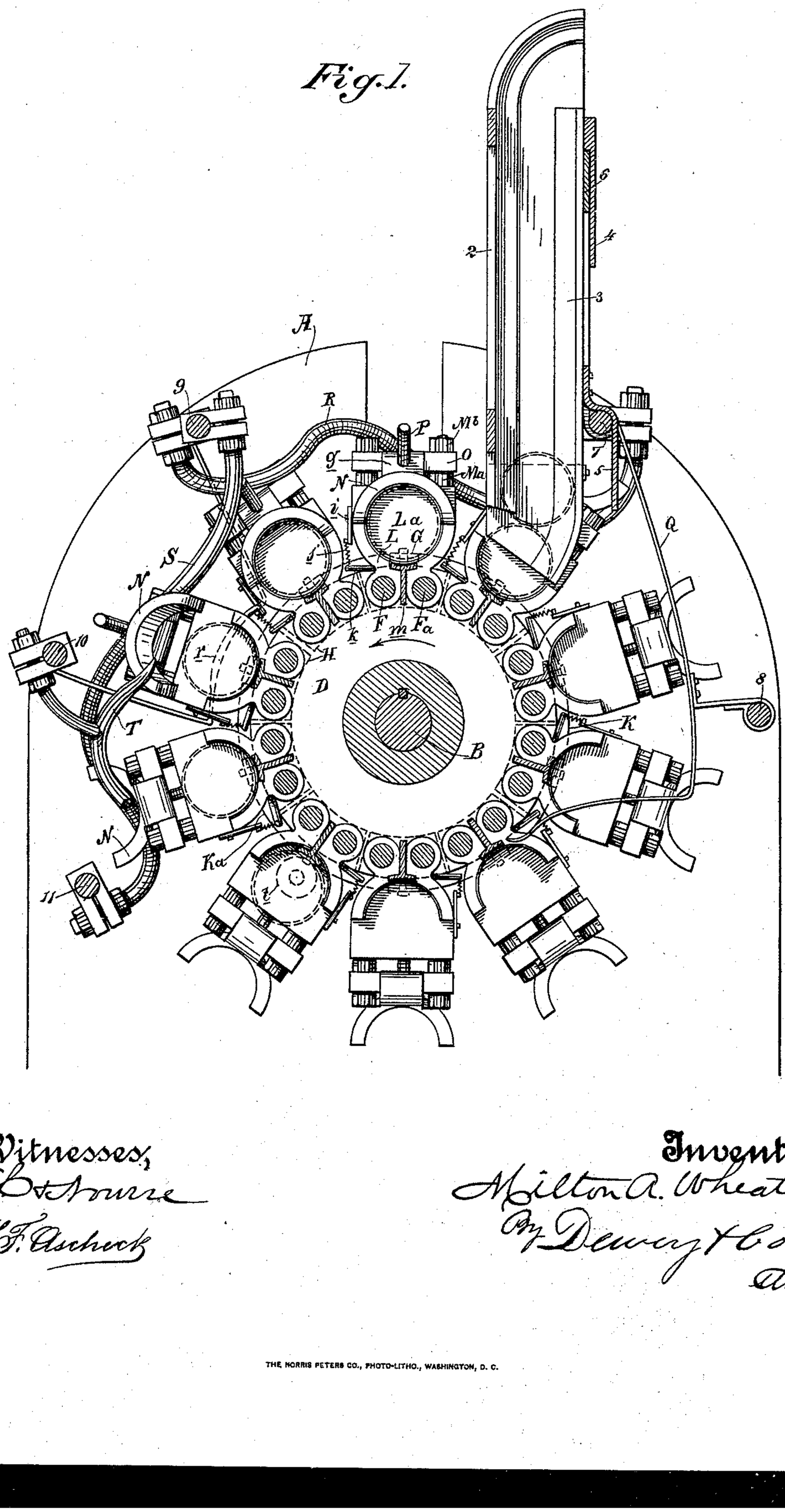

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Fig. 2.

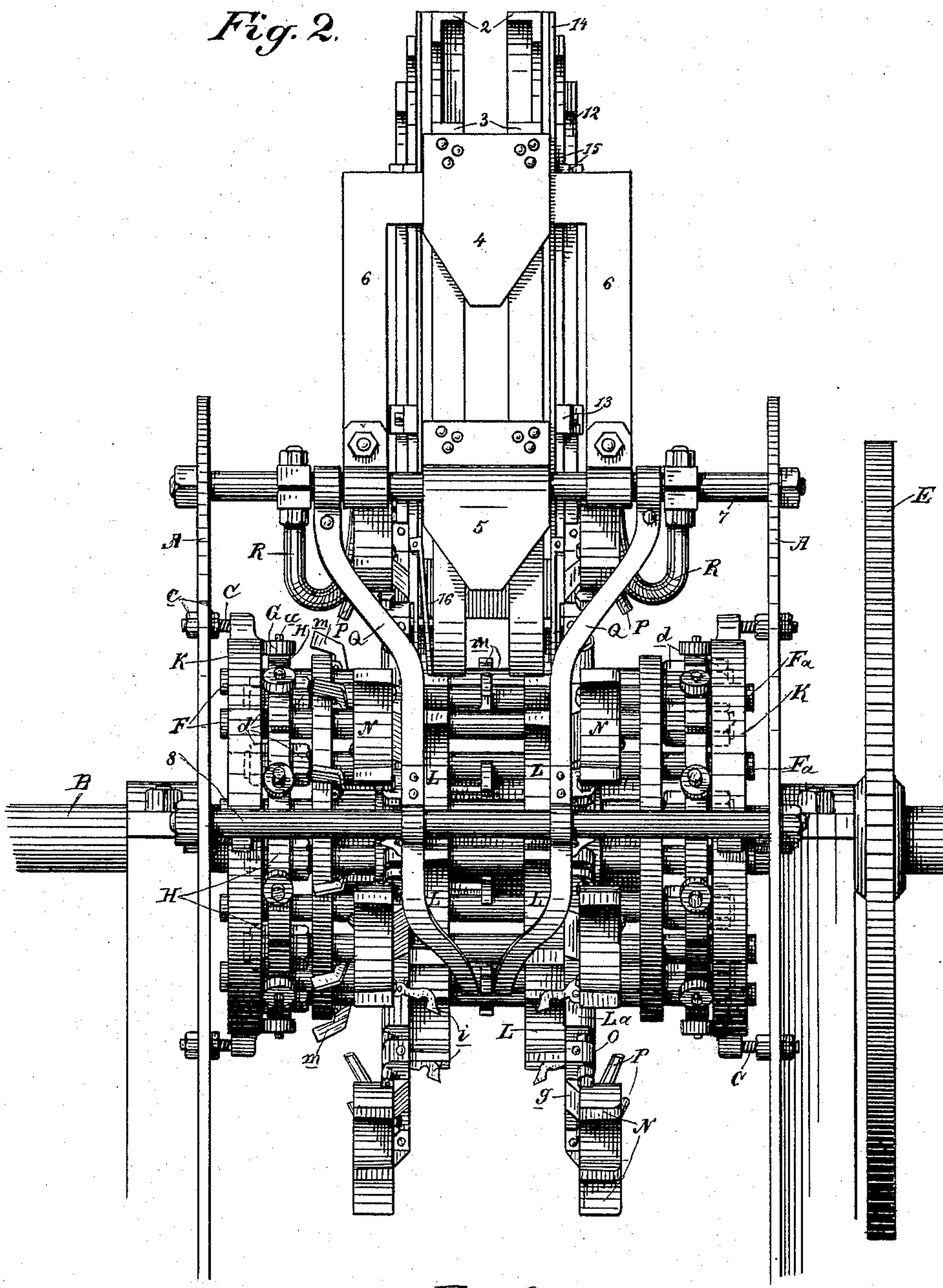

Fig. 3.

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Fig. 4.

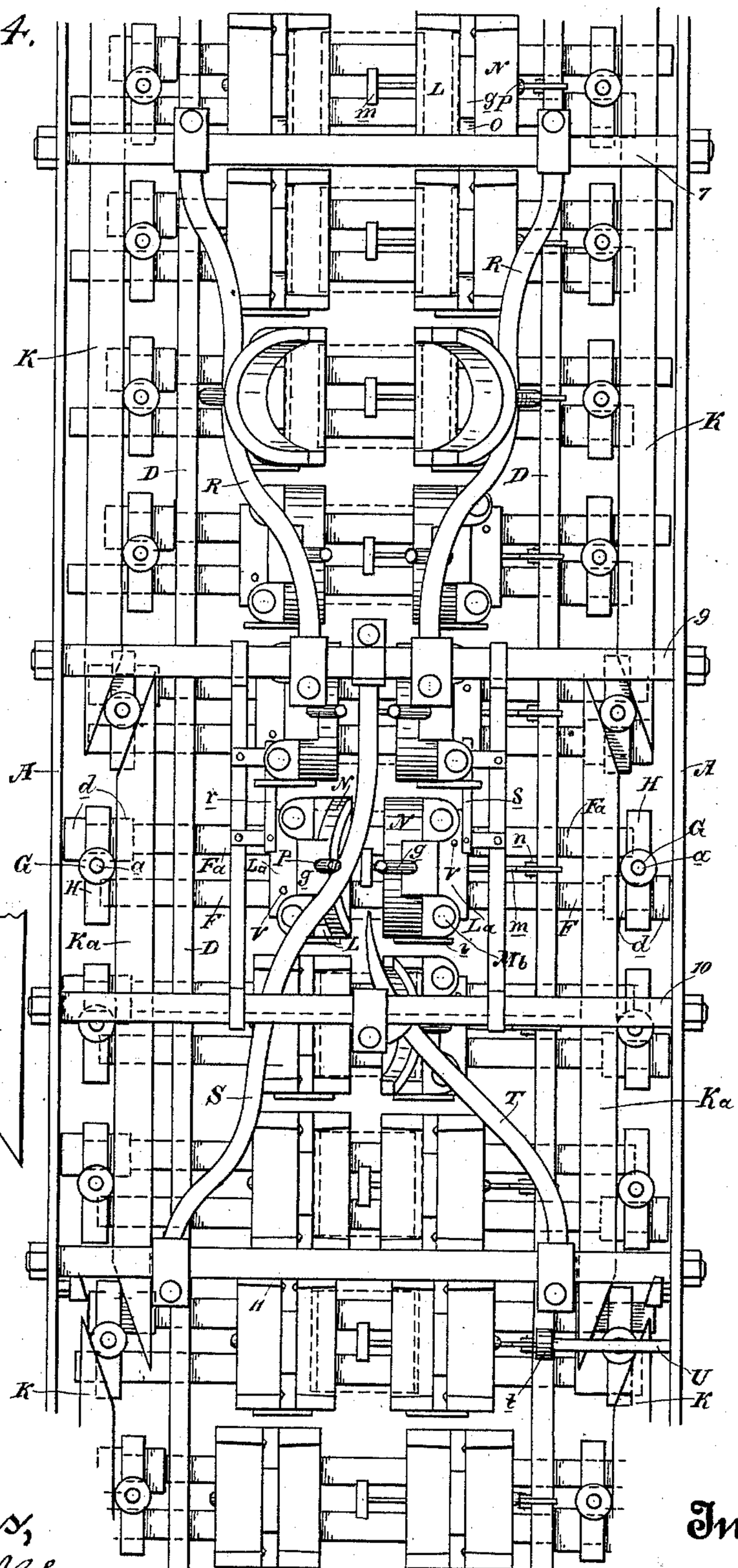
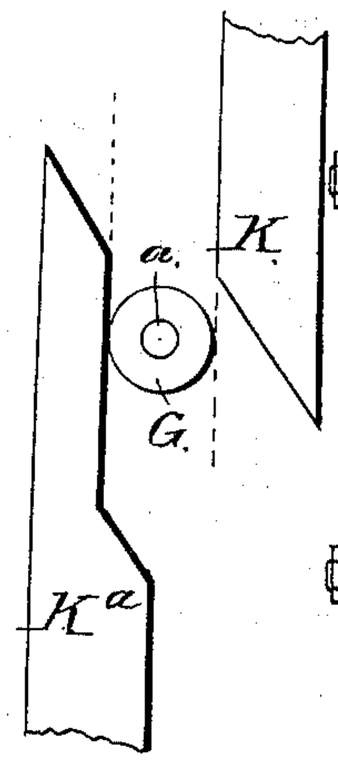


Fig. 9.



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CAN HEADING MACHINE.

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Fig. 5.

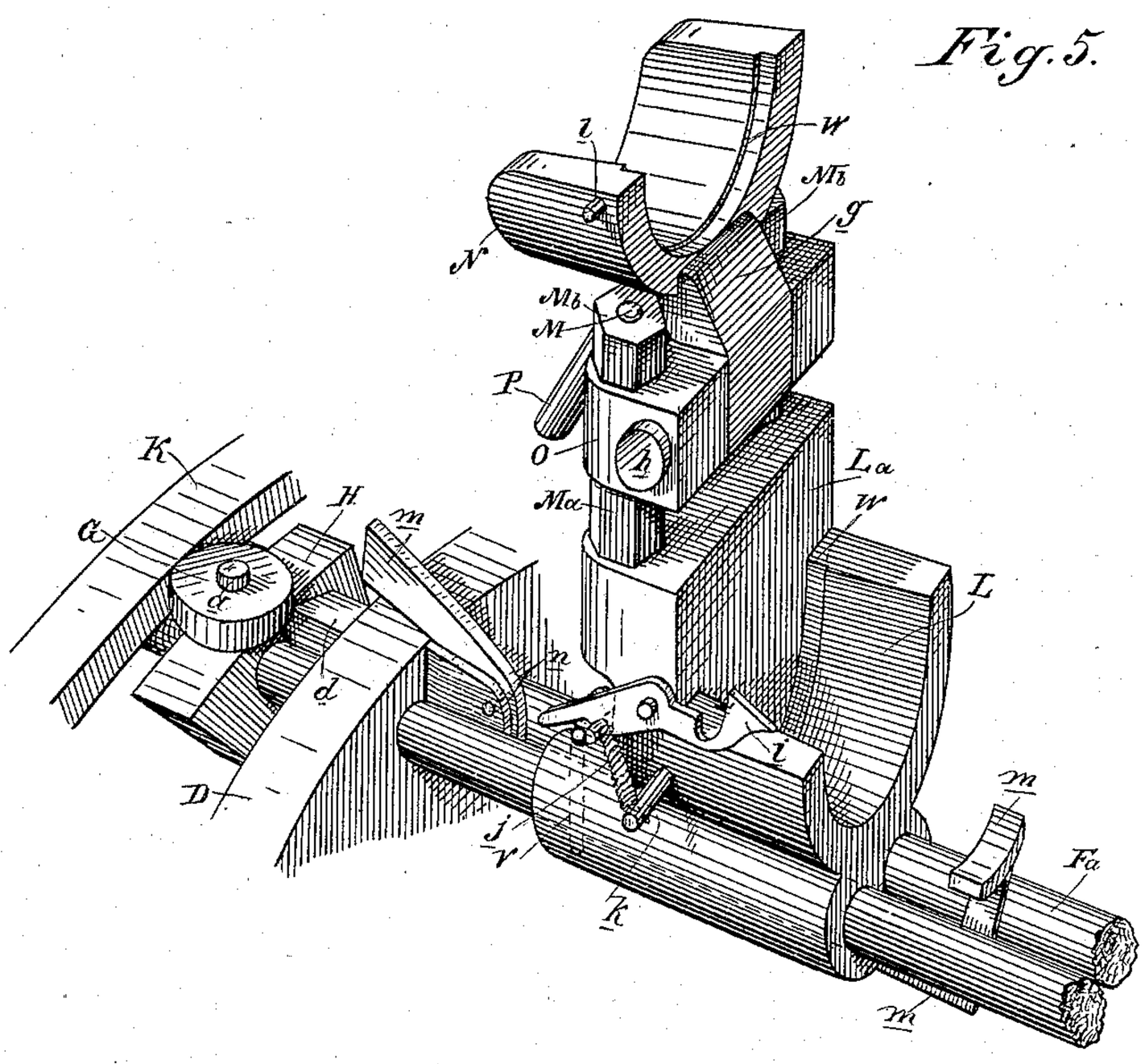
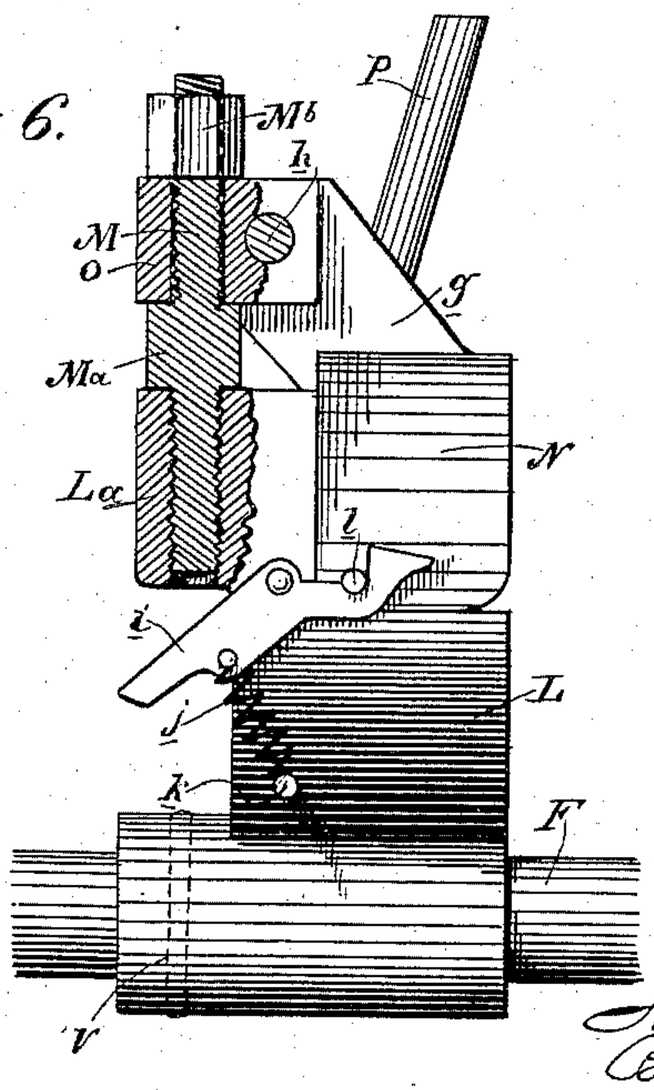


Fig. 6.



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(No Model.) 5 Sheets—Sheet 5.

M. A. WHEATON.

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Fig. 7.

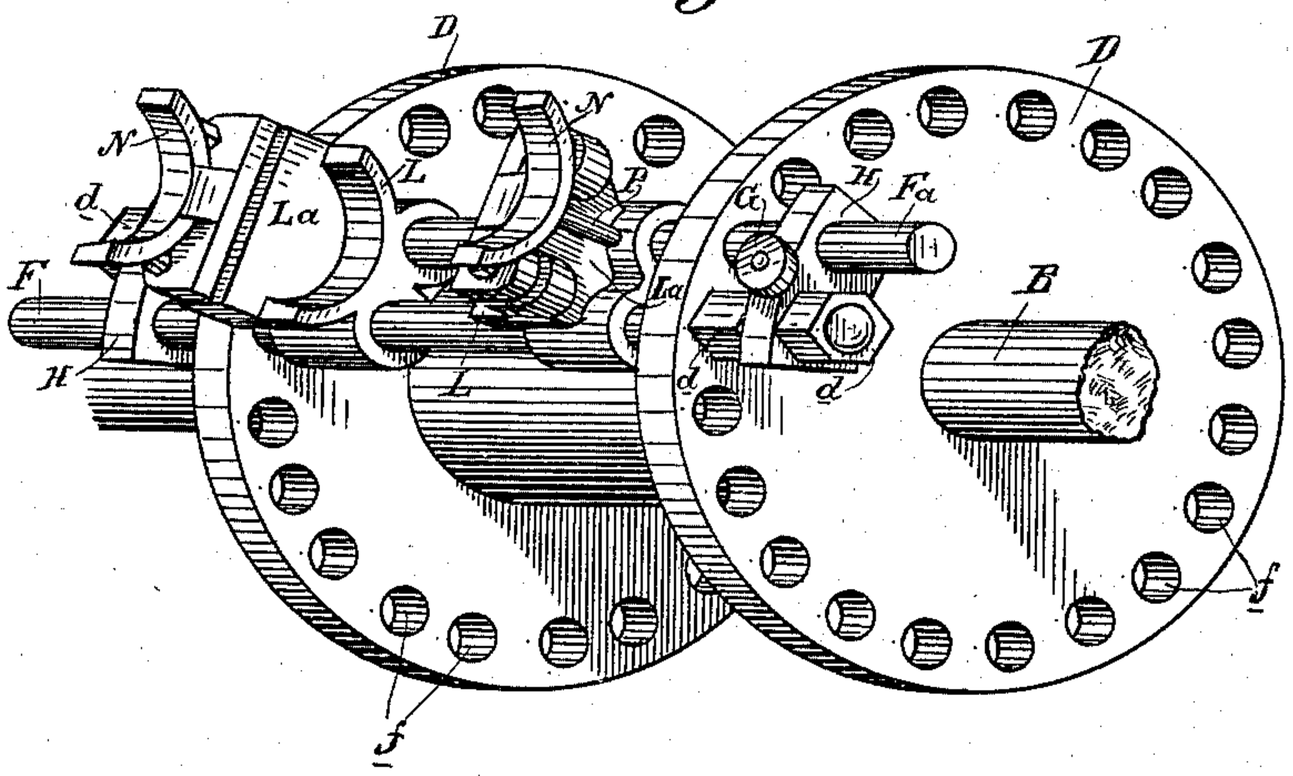
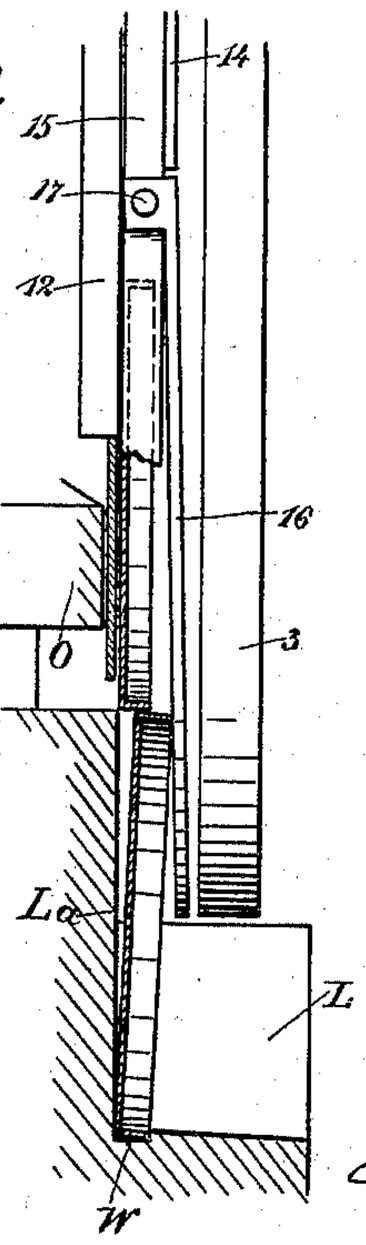


Fig. 8.



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UNITED STATES PATENT OFFICE.

MILTON A. WHEATON, OF SAN FRANCISCO, CALIFORNIA.

CAN-HEADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 477,584, dated June 21, 1892.

Application filed November 27, 1891. Serial No. 413,323. (No model.)

To all whom it may concern:

Be it known that I, MILTON A. WHEATON, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Can-Heading Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to can-heading machines; and it consists of the constructions and combinations of devices which I shall hereinafter fully describe and claim.

In the drawings, Figure 1 is a vertical section taken through the middle of the machine from front to rear. For convenience I designate the left-hand side of Fig. 1 as the "front" of the machine and the right-hand side of Fig. 1 I designate as the "back" of the machine. Fig. 2 is a view showing an elevation of the back of the machine. Fig. 3 is a horizontal cross-section taken through the feed-chute. Fig. 4 is a plan view of the circumference of the machine as it would appear if unrolled and spread out in a horizontal plane. Fig. 5 is a perspective detail view of one of the sets of jaws of the machine with its connecting devices. In this view the jaws are open, the outside jaw N being turned over on its hinge-bolt *h* one-half of a revolution. Fig. 6 is a side view of the same set of jaws closed and locked together. Fig. 7 shows the main driving-shaft B of the machine and a spool with two end disks D D, each one of which is perforated with twenty holes *f*, arranged in a circular line concentric with the driving-shaft B and near to the periphery of the disk; also, two sets of open jaws, which stand facing each other, and rods F and F^a, which carry the jaws; also, collars H H and nuts *d d*, which are used in connection with the rods F and F^a, and also a friction-roller G, one of which is pivoted by a stud *a* to each collar H for the purpose of moving the rod to which the collar is attached, as hereinafter explained. Fig. 8 is a sectional edge view showing a portion of the lower part of one of the chutes for the can-heads with a portion of adjacent parts. Fig. 9 is an enlarged detail showing the cut-away portions of the cam-rings K and K^a and one of the rollers G.

The same letters and figures of reference in the several figures of the drawings indicate corresponding parts.

In the drawings, A represents the main frame of the machine.

In my machine the outside jaw of each set of jaws opens away from the inside jaw of the set about an axis which is transverse to a line passing through the centers of the two sets of jaws, and incidentally through the central axial line of each can-body when it is in place between the jaws. By constructing a machine with the jaws opening in this direction I am enabled to arrange the sets of jaws in a circle and very near to each other, as no space need be left between the sets of jaws in the same circular line to accommodate their opening toward each other, and I thereby make a machine which will head cans with great speed, while its own motions are comparatively slow.

No particular form of frame is requisite. It is shown in the drawings as being composed of thick metal sheets at each side of the machine, secured to upright standards, which furnish supports for the boxes in which the main shaft B turns. Perforations are made wherever necessary through these metal side sheets, through which metal rods and bolts are passed to furnish the cross-pieces of the frame, and also to furnish fastenings and connections for other devices. These rods and bolts are made adjustable sidewise with the machine by being themselves secured by adjustable screw-nuts on one or both sides of the respective metal sheets, which form the sides of the frame.

7, 8, 9, 10, and 11 in Figs. 1, 2, and 4 show cross-rods that connect the two sides of the frame and constitute the cross-pieces of the frame.

In Fig. 2 is shown the driving-wheel E, mounted upon the main shaft B. This driving-wheel may be either a belt-pulley or a gear-wheel, but I prefer a gear-wheel, since it runs at only a slow rate of speed, for which belts are not so well adapted. The machine is driven by power applied in any convenient manner to the driving-wheel.

In Figs. 2 and 7 are shown two disks D D. These disks are each perforated by a row of twenty holes, which pass through them near

their peripheries in a circular line, which is concentric with the main shaft B. Metal rods F and F[a] pass through these holes and are used for carrying the jaws, as hereinafter described. Each one of these rods passes through both of the disks, as shown in Fig. 7. The rods operate in pairs, one rod moving in one direction while the other moves in the opposite direction. The two disks mentioned are shown in the drawings as forming the ends of a spool, which is fixed upon the central shaft B. Instead of forming the ends of a spool the disks may be made separate from each other and fastened directly upon the main shaft. The disks are fixed at a suitable distance from each other, such distance depending upon the length of the cans to be headed and the idea of the constructor as to the amount of space that he may desire to have left vacant between the disks or occupied by other mechanism that he may place between them.

Each pair of rods F and F[a] carry and operate two sets of jaws. I designate both of the two halves that form the entire circular ring that incloses a can-head and one end of the can-body as a "set of jaws." The half of this entire ring which is nearest to the rods F and F[a], I designate as the "inside jaw," and the other half of the ring which turns back away from the inside jaw when the jaws open I designate as the "outside jaw." The outside jaws are marked N in the drawings and the inside jaws are marked L. Each one of the inside jaws L, with its inside extension, through which the rods F and F[a] pass, and also the back part L[a] are shown in the drawings as being made in one solid piece of metal. Instead of this the parts, if preferred, may be made separately, so that either part may be replaced by a new one in case of wear.

Two screw-bolts M M are made with a flange M[a] near their middle part and with screw-threads cut both above and below the flange, as shown in Fig. 6. These bolts are screwed down into the block L[a] nearly to the flanges. Metal blocks O O are perforated, so as to slide down over the upper ends of the bolts and rests upon the flanges M[a]. Nuts M[b], Fig. 5, on the upper ends of the bolts screw down tightly upon the blocks O O and fasten them rigidly in place. The blocks O O may be raised or lowered to perfectly adjust the distance between the outside jaw N, which is carried by the blocks O O and hinge-bolt *h*, and the inside jaw L by loosening the nuts M[b] and turning the bolts M M, so as to screw them farther into or out of the back L[a], and then again tightening the nuts M[b] upon the blocks O O. The outside jaw N is made with a shank *g*, as shown plainly in Fig. 5. This shank *g* fits in the space between the blocks O O, and a hinge-bolt *h* passes through the blocks O O and the shank *g* of the outside jaw and hinges the outside jaw in its place, so that it may stand open, as shown in Figs. 5 and 7, or be turned and closed, as shown in Fig. 6. A latch *i* is pivoted to the edge of the back L[a] and is fixed normally in the position shown in Figs. 5 and 6 by a spring *j*, which is fixed at one of its ends to a small stud in the latch and at its other end is fixed to a stud *k*, that projects below from the edge of the back L[a]. A small stud *l* projects from the side of the outside jaw, and when the outside jaw is turned down and closed with the inside jaw the stud *l* in descending will strike the upper edge of the latch *i*, and, pressing it downward, will pass into the notch shown in the latch, when the spring *j* will retract the latch and lock the two jaws together, as shown in Fig. 6. A long metal pin P is fixed in the outside jaw or in its shank, as shown, and is used as a lever for the purpose of revolving the outside jaw on its hinge-bolt, so as to open and close the jaws, as required. The pin P at the proper time strikes against bent cam-rods, which are fixed in their several positions, as hereinafter explained, and when the pin P comes in contact with either one of such cam-rods it revolves the outside jaw, to which it belongs, around the hinge-bolt *h* in the direction which may then be required. A pin V passes through the inward extension of each inside jaw and one of the rods F or F[a], as shown in Fig. 5, and thereby secures the set of jaws, with their fastenings and connections, to the rod and compels them to move with it. Each pair of rods F and F[a] carries two sets of these jaws with their fastenings and connections. The other set of jaws that are placed upon the rods F and F[a], as shown in Fig. 7, is fastened by a similar pin to the other rod F[a], so that one set of each companion sets of jaws is fastened to the rod F of each pair of rods, while the other set of jaws is fastened in the same manner to the other rod F[a]. As these rods move in opposite directions, their movements cause the two sets of companion jaws which they carry to alternately approach toward and recede from each other when the machine is in operation. There are twenty sets of these jaws in the machine shown in the drawings, and they are all made precisely alike and all operate precisely alike. They all have the same kind of fastenings and connections, except that, as ten sets of the jaws stand facing the other ten sets, one half of the latches *i*, with their fastenings, are fixed upon the right-hand edges of the backs L[a], while the other half are fixed upon the left-hand edges of such backs. This is done in order that the latches *i* may all be upon the back sides or edges of the jaws as they revolve forward around the central shaft.

H is a collar that is perforated, and both rods F and F[a] pass through it. On the end of rod F[a] (shown in Fig. 5) a screw-thread is cut long enough to permit a nut to be used on both sides of the collar, with something to spare for adjustments. The rod F[a] first has the inside nut screwed upon it, then the collar H is placed on it and the second or outside nut is screwed upon it. Upon the other end

of its companion rod F another collar H is fastened in the same manner. The rods, either before or after the collars are fastened to them, are put in their places in the disks, the two sets of companion jaws being placed upon the rods as the rods are being placed in the disks. The sets of jaws are fastened to their respective rods by the pins V V, as before described. The smooth end of each rod passes loosely through the collar that is fastened to the adjacent end of its companion rod. This is done only for the purpose of holding the collar better in its place, and is not necessary. In this manner one of the collars is attached rigidly to one end of one of the rods and the other collar is attached rigidly to the other end of its companion rod, and one of the sets of jaws is attached to one of the rods, while the other set is attached to the other rod. One rod slides loosely through the inner extension of the inside jaw and through one end of the collar, and the other rod slides loosely through the corresponding extension of the other inside jaw and through one end of the other collar.

Upon each one of the collars H is fixed a suitable stud *a* and a friction-roller G. These friction-rollers are moved in a direction that is lengthwise with the rods F and F^a by coming in contact with the inclines at the ends of sectional cam-rings K and K^a. (Shown in Fig. 4.) These cam-rings K and K^a are placed concentric with the central shaft B. Only a limited movement of the friction-rollers G and rods F and F^a are required, as each of the sets of jaws which they carry will not require to be moved more than one inch in either direction in ordinary machines. The sectional cam-rings K and K^a are inclined near their ends, as shown in Fig. 4, and are stationary, being fixed rigidly to the frame. As the friction-rollers G are carried around by the revolving shaft they come in contact with the inclined edges of the sectional cam-rings, and are thereby forced to move crosswise with the machine until the inclines that are near the ends of the sectional cam-rings are passed and the straight edges of the cam-rings are reached by the rollers. The friction-rollers draw with them the rods F and F^a and the two sets of jaws which they carry. In their movements crosswise with the machine each friction-roller belonging to the same companion pair of rods, with the collar and rod and set of jaws which it draws with it, moves in one direction, while the other friction-roller belonging to the same pair of companion rods and the collar and rod and set of jaws which it draws with it moves in the opposite direction. Each set of jaws is fixed nearest to the free-sliding end of the rod that carries it and farthest from the end to which the collar H is attached. By means of this arrangement the two sets of jaws that face each other on the same pair of rods approach toward each other when the friction-rollers that are attached to those rods are drawn in opposite directions from each other, and when the same friction-rollers move toward each other the two sets of jaws will move farther apart from each other. By means of the screw-thread on each one of the rods F and F^a and the nuts *d* on each side of the collar H the rods F and F^a can be moved and adjusted lengthwise, and the two sets of jaws, which are fixed to them, as described, can be moved permanently nearer to each other or farther apart. The friction-rollers G, bearing against the sectional cam-rings K and K^a, fix and control the relative positions of the opposing sets of jaws, which stand facing each other in the machine, and by means of screw-threads on the bolts C and the nuts *c*, by means of which the sectional cam-rings K and K^a are attached to the frame of the machine, the sectional cam-rings which are opposite to each other across the machine may be moved closer together or farther apart, and in this way the opposing sets of jaws may be moved permanently, either nearer together or farther apart, as may be desired.

At the inside edge of the jaws, next to the back L^a, is cut an annular channel W to receive the can-head. The front edge of the channel W forms an annular shoulder that covers the front edge of the rim of the can-head and forms an abutment, against which it may bear. This annular shoulder reduces the open diameter within the jaws, so that it is just small enough to surround the end of the can-body—that is, to have the head placed upon it—and guide it into the rim of the can-head when the can-head is forced forward. From this annular shoulder to the outward edge of the jaw the jaw flares outwardly, thus increasing the diameter of the ring formed by the closed jaws as it extends forward from the can-head channel W. By this arrangement the end of the can-body is received in the inside jaw L at a point where the diameter of the jaw is greater than the diameter of the can-body, and if the can-body is considerably "out of round," as it usually is, it will be inclosed by the jaws and headed, the same as though it was exactly round when the jaw received it.

In Fig. 5 is shown a bent lever *m*, which is pivoted at *n*. This lever is bent downward, so as to pass underneath the inside jaw L. After passing underneath the jaw the inner end of the lever rises up between the jaws, as clearly shown in Fig. 5. At the inner end of the lever *m* is fixed an attachment that is shaped so as to about fit the side of the can-body when one is in the jaws. A friction-roller *t*, mounted on the end of a stationary stud-arm U (shown in Fig. 4) is permanently located at the proper point, so that the shorter end of the lever *m* will come in contact with it and force the attachment at the inner perpendicular end of the lever against the can, and thereby force it out from its place in the jaws. This should occur after the heads have been forced upon the can-body and just when the jaws have opened and the two sets have

slightly drawn apart, so as to loosen their pressure upon the can and at the point at which it is desired to eject the headed can from the machine. A good arrangement is to cut away, as shown in Fig. 9, the inside edge of the cam-rims for a few inches back from the point where the friction-rollers G first strike the inclines and leave them of such shape that when the jaws have separated enough to loosen the headed can the jaws will remain at that distance apart until the rollers have passed the few inches along the cut-away part of the cam-rims, when they will move inward to the edge of the cam-rims, where they are not cut away, and the jaws will be separated to their farthest distance from each other. This will give ample time in which to throw the headed can out from the jaws before the jaws have separated far enough to pull off either of the can-heads. Each of the outside jaws has fixed to it a long pin P, as shown. By means of these pins and the two pairs of bent rods R R and S T these outside jaws are opened and closed, as heretofore explained. Another pair of short cam-rods *r r* are used for unlocking the outside jaws from the inside jaws, so as to permit the outside jaws to open at the proper time. The cam-rods R R are bent in a partially-spiral form, and located, as shown, so that the pins P P of two opposite sets of jaws will come in contact with them and be turned by them in the directions desired. (See Figs. 1, 2, and 4.) The pins P P always come in contact with the cam-rods R R when the outside jaws to which the pins belong are open and the pins are pointing downward, as shown in Fig. 5. The pins follow along the cam-rods and are turned by them, and make the jaws to which they are attached revolve around their hinge-pins *h* and close with the inside jaws. A short cam-rod *r* (shown in Figs. 1 and 4) is supported by metal straps attached to the stationary cross-rods 9 and 10 of the machine frame, and is so located that as the machine revolves around the main shaft the under side of the short end of the locking-levers *i* will come in contact with the cam-rod *r* and be lifted up and made to unlock the jaws from each other, so that they may be separated and opened after the heads have been forced upon the can that is held by them. A similar short cam-rod *r* (shown in Fig. 4) operates in the same way to unlock the opposite set of jaws and allow them to be opened also.

S and T are two stationary cam-rods that are bent in a partially-spiral form and placed in the positions shown, so that as the machine revolves the pins P P will come in contact with them when the jaws are closed and will follow along them lengthwise, and thereby the pins and the jaws to which they belong will be revolved around their hinge-pins *h h* and the jaws opened. In forcing the can-heads upon the can-body the two sets of jaws will advance so nearly together that there will not remain a sufficient amount of room between them to allow the outside jaws to swing open at the same time without coming in contact with each other. For this reason it is necessary that one of the outside jaws should be partly opened in advance of the opening of the other. To accomplish this result, the cam-rod S extends farther up in the machine than does the cam-rod T. One of the pins P therefore comes in contact with the cam-rod S before the other pin P comes in contact with the cam-rod T, and the pin P that comes in contact with the cam-rod S, and the jaw belonging to it will be revolved and partly opened before the other pin P and the jaw belonging to it will have commenced to open. The cam-rod S is fastened to the cross-rod 9 of the machine above the point at which the pin P comes in contact with it.

Q Q, Figs. 1 and 2, are used as guide-rods to guard against accidents. After the can has been headed and ejected from the machine the two sets of jaws in which the can was headed should remain open until they are carried around under the chute and receive another can-body with the heads that are to be placed upon it. While passing along this distance the outside jaws of the two sets, if left unguarded, are liable to swing partly shut and not be in the proper position to pass under the chute when they reach it. For this reason the guide-rods Q Q are so placed that the outside jaws will be prevented from closing as they ascend at the back of the machine, and will be guided so that they will pass under the chute in the proper open position to receive the can-heads and can-body. The upper parts of the rods Q Q, above the points at which they cease to act, as guide-rods are spread apart and carried upward for the purpose of conveniently fastening them to the cross-rod 7 of the machine-frame. They are also secured lower down to the cross-rod 8 of the frame. The lower ends of these guide-rods Q Q are bent, as shown in Fig. 1, so their extreme lower ends will reach under and throw out from the machine any can or can-body that may accidentally remain in the jaws instead of being ejected from them at the proper place.

The chutes for delivering the can-bodies and can-heads into the jaws of the machine may be of any convenient construction. As shown in the drawings, the chute for the can-bodies is made of four pieces of angle-iron 2 2 and 3 3, fastened together with metal sheets or cross-pieces. The lower end of the chute should be made so as to confine the can-body as closely as possible and not interfere with its freely passing through the chute. This is in order to prevent its getting wedged by bounding out of its proper position when it strikes the jaws in its downward passage. Short guides should extend in front of the chute to secure the placing of the ends of the can-body equally upon each one of the jaws L L.

The chutes for the can-heads are placed at the sides of the chute for the can-bodies. The

vertical rods 12 12 serve as the outsides of the head-chutes. These vertical rods are held in their positions by suitable brackets 13, Fig. 3, extending across the chutes and secured to their vertical side pieces 15, Fig. 8. At the inside of their lower ends the rods 12 have fastened to them a thin metal sheet that extends nearly across the chute to better guide the can-heads into the jaws. The rods 12 are cut short, so that no part of the jaws can come in contact with them. The thin metal sheets at the inside of the lower ends of the rods extend below the rods. They are hung so as to allow the backs L^a of the jaws to pass under them, and their inside faces should be in line, both vertically and crosswise, with the inside faces of the backs L^a, so that the latter will form a continuation of the front side of the chute while the can-head is passing from the chute into the jaw.

It is of the greatest importance that every can-head shall pass with certainty into the channel W of the inner jaw. Whenever the can-head fails to pass directly into the channel W, it is quite sure to be mashed in the machine and be destroyed. In order to more certainly guide each can-head into its channel W in the inner jaw, I form the back of the chute in two parts. The upper part 14, Figs. 3 and 8, is simply a straight sheet of metal fixed rigidly in its position. In Fig. 8 is shown the lower part of the back. (Marked 16.) This lower part of the back extends downward in front of the back L^a of each passing jaw as far as practicable and allows the jaw L to pass under it. The can-head passes between this downward extension and the face of the back L^a. I arrange this lower part 16 so that its lower end may swing toward the back L^a of each passing jaw. I do not permit it to swing far enough in the opposite direction to allow the edges of the can-heads in the chute to pass each other, and thus get wedged in the chute.

At each of the opposite corners of the swinging back 16 is fixed a lug 17, by means of which this swinging back is pivoted to the two vertical side pieces 15 of the chute, one of which is shown in Fig. 8. (See 15 and 17, Fig. 8.) These pivots are placed considerably at one side of the vertical line of the back, so that the weight of the part will cause its lower end when unobstructed to swing toward the back L^a of the passing jaw. As the can-head is delivered into the jaw while the jaw is passing the chute, the tendency of the swinging back 16 is to swing toward the back L^a, and the can-head channel W makes it bear with a slight pressure against the front edges of the descending can-head rim, and thereby presses the can-head against the back L^a and directs it more certainly into its channel W. A gentle spring may be used to make the back 16 swing against the rim of the can-head and press the head against back the L^a, as above described. This pressure against the can-head should not be enough to create a friction that would stop the movement of the can-head nor so little as not to insure its delivery with certainty into the channel W. In Fig. 8 the lower can-head is shown with its upper edge leaning away from the back L^a. It is for the purpose of placing and retaining the can-head directly against the back L^a as it slides into the channel W, and preventing any such leaning, that I make the part 16 to swing with the slight pressure against the can-head, as described.

A frame 6 6 is rigidly attached to the cross-rod, as shown at Fig. 2. Two strong metal sheets 4 and 5 are fastened across the chutes, as shown in Fig. 2. Below their fastenings these metal sheets are each respectively bent far enough away from the chutes to allow the top of the frame 6 6 and the cross-rod 7 to respectively pass in between the sheets 4 and 5 and the chutes. The sheets 4 and 5 are respectively hooked over the top of the frame 6 6 and the cross-rod 7, and hold the chutes in their proper positions. By means of this method of connecting the chutes with the machine the chutes may be at any time removed by simply lifting them vertically from the machine.

On the sides toward the back of the machine the lower ends of the chutes are curved a little forward, as shown in Fig. 1. This curvature is made for the purpose of delivering the heads and bodies of the cans from the chutes into the jaws on a line that is radial with the circle in which the jaws revolve around the central shaft.

The operation of the machine is as follows, viz: The chutes are kept filled with can-heads and can-bodies. These stand in columns resting one upon the other, except the lower ones, which will rest upon such part of the jaws as happens to be under them. The machine is set in motion, and as it revolves the jaws will pass under the chutes and each set of jaws will receive the lowest can-body and also the lowest can-head that is in each one of the can-head chutes. The can-heads will be at each end of the can-body in the jaws. The jaws will pass forward from under the chutes, carrying the can-body and can-heads with them, and will be followed by the next sets of jaws, which will in like manner receive the next can-body and next can-heads then in the bottoms of the chutes. Each can-body and the can-heads belonging to it will be carried forward by the jaws as fast as they receive them, and the columns of can-bodies and can-heads will constantly descend and fill the places of those thus carried away in the jaws. As the jaws pass forward the pins P P in the outside jaws will strike against the cam-rods R R, and those jaws will be turned over and close with the lower jaws under them. The levers *i* will operate as before described and lock the jaws together with the can body and heads fast inclosed within them. The friction-rollers G G, belonging to the rods F and F^a, which carry that set of jaws, will then come

in contact with the inclines at the ends of the sectional cam-rings K^a at each side of the machine and will be drawn farther apart, thereby drawing the two sets of jaws toward each other and forcing the can-heads upon the can-bodies. The under side of the short ends of the levers *i* will next strike the upper sides of the cam-rods *r r* and unlock the outside jaws from the inside jaws. Before the short ends of the levers *i i* have passed the entire length of the cam-rods *r r* the pins P P will have struck the cam-rods S and T and opened the jaws far enough so that they cannot close together and be again locked before they shall have been fully opened. As the machine continues to rotate, the jaws will be fully opened and the friction-rollers G G will pass beyond the sectional cam-rings K^a K^a, and will strike the inclines reaching back from the ends of the sectional cam-rings K K. Just as the rollers strike the sectional cam-rings K K, and before the sets of jaws are drawn far enough apart to make it possible for either of the can-heads to be pulled off from the headed can that is in them, the short end of the bent lever *m* will come in contact with the stationary friction-roller *t*, and the headed cam will be thrown from the jaws. As the friction-rollers G G pass along the inclines at the ends of the sectional cam-rings K K they will be pressed toward each other and the two sets of jaws to which they belong will be moved to their farthest limit from each other. They will continue in this position until they have again passed under the chutes, ready to repeat their operations by heading another can.

All the sets of jaws in the machine operate exactly alike, and each one of the sets repeats the operations above described. The machine is continuous in its operation and is capable of doing more than double the work of any other can-heading machine ever made.

I have described my machine with the sectional cam-rings K and K^a placed upon both sides of the machine and making all of the jaws move crosswise with the machine. While I prefer this method of construction, it is not necessary. It is only necessary that there should be sectional cam-rings on one side of the machine. One of every pair of the companion rods, either F or F^a, may be made rigid with one of the disks D. When this is done, all of the jaws that are on one side of the machine will be carried around in a direct line and all of the jaws on the other side of the machine will move crosswise with the machine as they are carried around. When only one-half of the jaws move crosswise with the machine, the inclines on the one set of sectional cam-rings should be increased, so as to move those jaws a greater distance, and thereby obtain all the crosswise movement for them that is required for accomplishing the same results that are accomplished when all the jaws move crosswise with the machine, as herein described.

As my machine is new in its general plan and in its details of construction and operation, I do not confine myself to the particular construction herein described. The machine may have a greater or less number of jaws and be changed in many other respects and still contain the substance of my invention.

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

1. In a can-heading machine, the combination of the inner semicircular jaw, which is carried around a central axis without changing its position in the radial line of the circle in which it is carried around, with an outside movable jaw opening about an axis transverse to the central line of the closed jaws to receive the can head and end of the can-body and again close around them, substantially as and for the purposes herein described.

2. In a can-heading machine, a series of sets of jaws which are carried around a central axis without changing their radial position with relation to such central axis and in which the outside jaw of each such sets opens by moving around an axis that is transverse to said central axis, in combination with mechanism for opening and closing such jaws, substantially as and for the purposes herein set forth.

3. In a can-heading machine, the combination of a set of jaws which are carried around a central axis without changing their position radially from such axis, in combination with mechanism for moving such set of jaws toward another set of similar jaws, substantially as and for the purposes herein set forth.

4. In a can-heading machine, two sets of jaws facing each other and carried around an axis without changing their position radially from such axis, in combination with mechanism by which the jaws are opened and closed, mechanism for forcing the jaws toward each other for putting the can-heads on the can-body, and mechanism, substantially as described, for moving the sets of jaws farther from each other after the heads have been placed upon the can-body.

5. In a can-heading machine having opposing sets of jaws carried around a central axis and in which the outside jaw of each set opens by moving around an axis that is transverse to said central axis, the combination of the rods F and F^a with the two sets of jaws which they carry, one of said sets of jaws being fastened to one of said rods and the other set of jaws being fastened to the other of said rods, substantially as herein described.

6. In a can-heading machine, opposing sets of jaws carried around a central axis and in which the outside or upper jaw of each set opens by moving around an axis that is transverse to said central axis and remains open while the can-head and end of the can-body are received by the inner or lower jaw and then closes with the inner or lower jaw and is locked therewith while the can-head is forced upon the end of the can-body.

7. In a chute for guiding the can-heads into

the jaws of a can-heading machine, the swinging part 16 or its equivalent in the lower part of the chute, whereby the delivery of the can-head from the lower end of the chute to its proper place in the jaw below is more accurately made, substantially as herein described.

8. The combination, with a set of jaws used in a can-heading machine and constructed substantially as shown, of the blocks O O, hinge-bolt *h*, and screw-bolts M M for the purpose of connecting the two jaws of the set together and adjusting and holding them in their proper positions relatively to each other, substantially as herein described.

9. In a can-heading machine, the combination of opposing sets of jaws carried around a central axis and in which the outside or upper jaw of each set opens about an axis that is transverse to said central axis, a pin P or its equivalent on the outside jaw, and a contact-piece, with which each pin engages to close each set of jaws, substantially as herein described.

10. In a can-heading machine having opposing sets of jaws carried around a central axis and in which the outside or upper jaw of each set opens by moving around an axis that is transverse to said central axis, the combination of said outside jaw of each set, the pin P, carried by said jaw, and the bent rod, with which the pin engages to open the sets of jaws, substantially as herein described.

11. In a can-heading machine having opposing sets of jaws carried around a central axis and in which the outside or upper jaw of each set opens about an axis that is transverse to said central axis, the combination, with said outside jaw, of the latch *i*, pivotally secured contiguous thereto, and a pin or stud on said outside jaw for operating the latch, substantially as herein described.

12. In a can-heading machine having sets of jaws in which the outside jaw of each set opens away from the inside jaw, around an axis that is transverse to the central axis of said sets of jaws, the combination of each one of the supporting-rods that carries one of the sets of jaws with a frictional wheel G or its equivalent and a sectional cam-ring K^a or its equivalent, for the purpose of moving the sets of jaws, with the supporting-rod, and forcing the can-head upon the end of the can-body, substantially as herein described.

13. In a can-heading machine operating substantially as herein described and having sets of jaws in which the outside jaw of each set opens away from the inside jaw, around an axis that is transverse to the central axis of said sets of jaws, the combination of the disks D D with the movable rods F F^a, the sectional cam-rings K K^a at one side of the machine, and a frictional roller G or its equivalent, substantially as herein described.

14. In a can-heading machine having opposing sets of jaws in which the outside or upper jaw of each set opens about an axis that is transverse to the central axis of said sets of jaws, the combination of the rods F and F^a for carrying said jaws, a support for said rods, means for rotating the support, the collars H for the rods, and the friction-roller G or its equivalent on said collars, substantially as herein described.

15. A can-heading machine consisting of the disks mounted upon a shaft and rotated in unison, rods passing through the disks in pairs near the periphery and parallel with the axis of rotation, and opposing jaws mounted upon the rods and each consisting of an inner half capable of movement parallel with the axis and an outer half movable with the inner half when closed together, said outer half being hinged to open outwardly from the inner half to admit the can heads and bodies, substantially as herein described.

16. A can-heading machine consisting of disks mounted on a shaft to rotate in unison, rods passing through the disks parallel with the axis of rotation, opposing jaws movable to and from each other upon the rods and each consisting of an inner half and an outer half hinged to open away from the inner half to admit the can heads and bodies, blocks to which the outer jaws are hinged, and screw-bolts and nuts by which the blocks are moved and the outer jaws adjusted with relation to the inner ones, substantially as herein described.

17. A can-heading machine consisting of parallel disks rotating in unison, rods passing through the disks parallel with the axis of rotation, opposing jaws movable to and from each other upon the rods and each consisting of an inner half having a single motion parallel with the axis, an outer jaw hinged to open and close about the inner jaw and also partaking of the end motion of the inner jaw, and a latch by which the jaws are locked together when closed, substantially as herein described.

18. In a can-heading machine, the opposing jaws in pairs adapted to receive the can-bodies and the opposite heads thereof and movable to and from each other, said jaws comprising an inner half and an outer half hinged to open and close with relation to the inner half, disks by which the jaws are carried around a common center of rotation, cams fixed with relation to the revolving disks, and pins fixed to the hinged outer jaws to engage the cams and open and close the jaws during their revolution, substantially as herein described.

19. In a can-heading machine, parallel disks rotating in unison about a common center, rods passing through the disks in pairs parallel with and around the center of rotation, opposing two-part jaws with mechanism by which the outer jaw of each set is opened and closed with reference to the inner jaw, fastenings by which one of an opposing set of jaws is secured to one of a pair of rods and the opposite set to the other rod, and mech-

anism by which the rods are moved longitudinally and the jaws are caused to approach and recede from each other, substantially as herein described.

20. In a can-heading machine, the parallel disks rotating in unison about a common center, rods passing through the disks in pairs parallel with and about the center of rotation, opposing two-part jaws with mechanism by which each opposing pair of jaws is opened to receive the can heads and body, fastenings securing one set of jaws to one of the rods and the opposite set to the other rod, collars fixed to the rods and anti-friction rollers journaled thereon, and stationary cam-rings over which the rollers pass to move the rods and cause the opposing jaws to approach and recede from each other, substantially as herein described.

21. In a can-heading machine, the parallel disks rotating in unison about a common center, rods passing through the disks in pairs parallel with and about the center of rotation, opposing two-part jaws, into which can-heads are received and placed upon the ends of can-bodies, each opposing set of jaws being secured to one of a pair of parallel rods, a mechanism by which the rods and opposing jaws are caused to approach and recede from each other as they revolve about the common center, and adjusting screws and nuts by which the sets of jaws may be moved toward or from each other upon their carrying-rods, substantially as herein described.

22. In a can-heading machine, the opposing two-part jaws supported around a common center, mechanism by which the jaws are opened to receive can heads and bodies, closed and moved toward each other to fix the heads upon the ends of the bodies and then retracted from each other, and a lever *m*, fulcrumed so that one end will act to lift the completed cans from the jaws when the latter are opened, and a fixed stud-arm engaging the opposite end of the lever and actuating it, substantially as herein described.

23. In a can-heading machine, the opposing sets of jaws arranged and revolving around a common center and in which the outer half of each jaw opens about an axis that is transverse to said central axis, a mechanism by which the outer half of each set of jaws is opened to receive the ends of the can-bodies, and the heads closed to hold and guide them when they are united together and opened to discharge the completed product, and guide-rods Q, whereby the outer swinging jaws are held open as they pass beneath the supply-chute to receive the can heads and body, substantially as herein described.

In witness whereof I have hereunto set my hand.

M. A. WHEATON.

Witnesses:
S. H. NOURSE,
HOLLAND SMITH.