(No Model.) 6 Sheets—Sheet 1.

M. JENSEN.

CAN CRIMPER AND CAPPER.

No. 376,804. Patented Jan. 24, 1888.

Fig. 1.

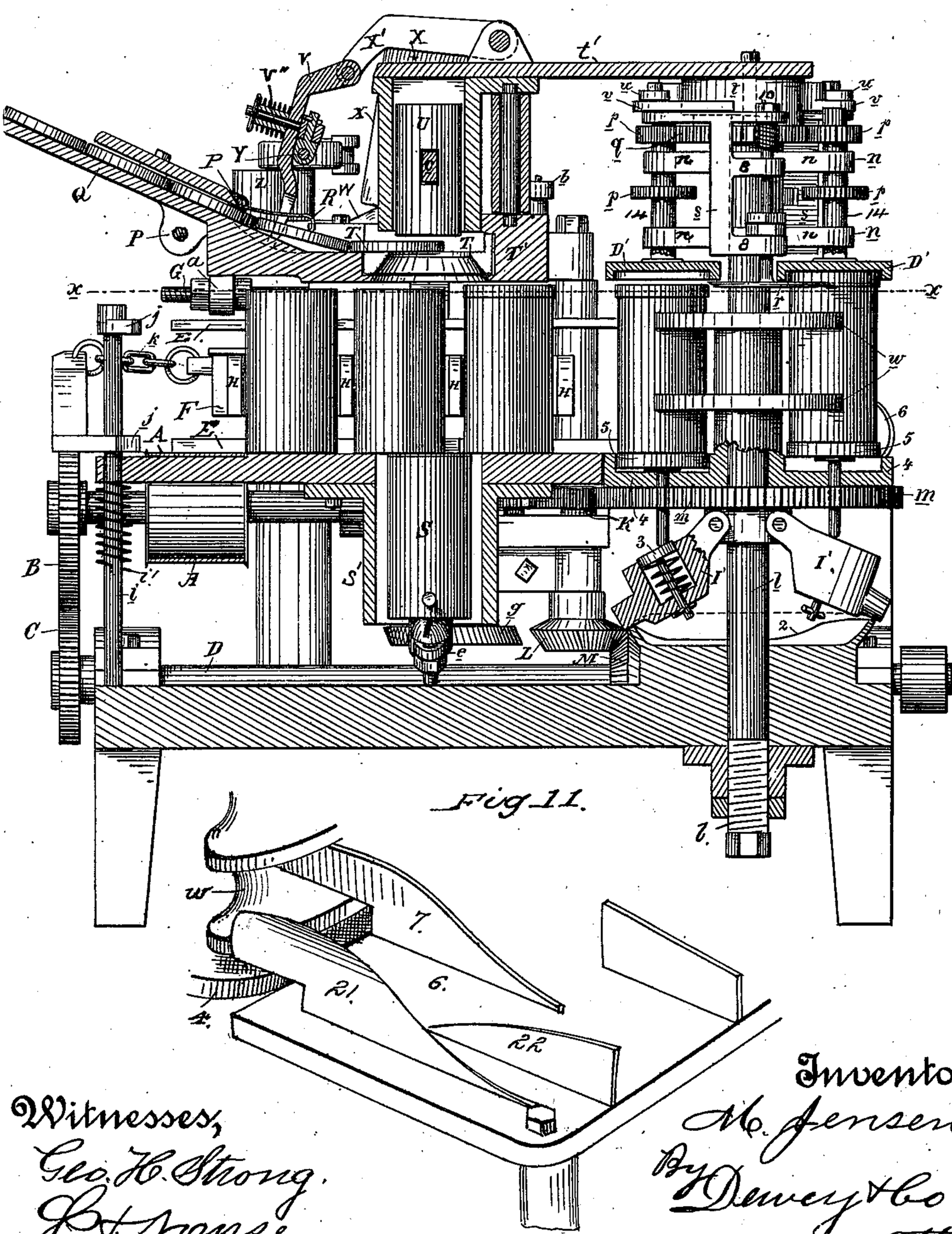

Fig. 11.

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(No Model.) 6 Sheets—Sheet 2.

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CAN CRIMPER AND CAPPER.

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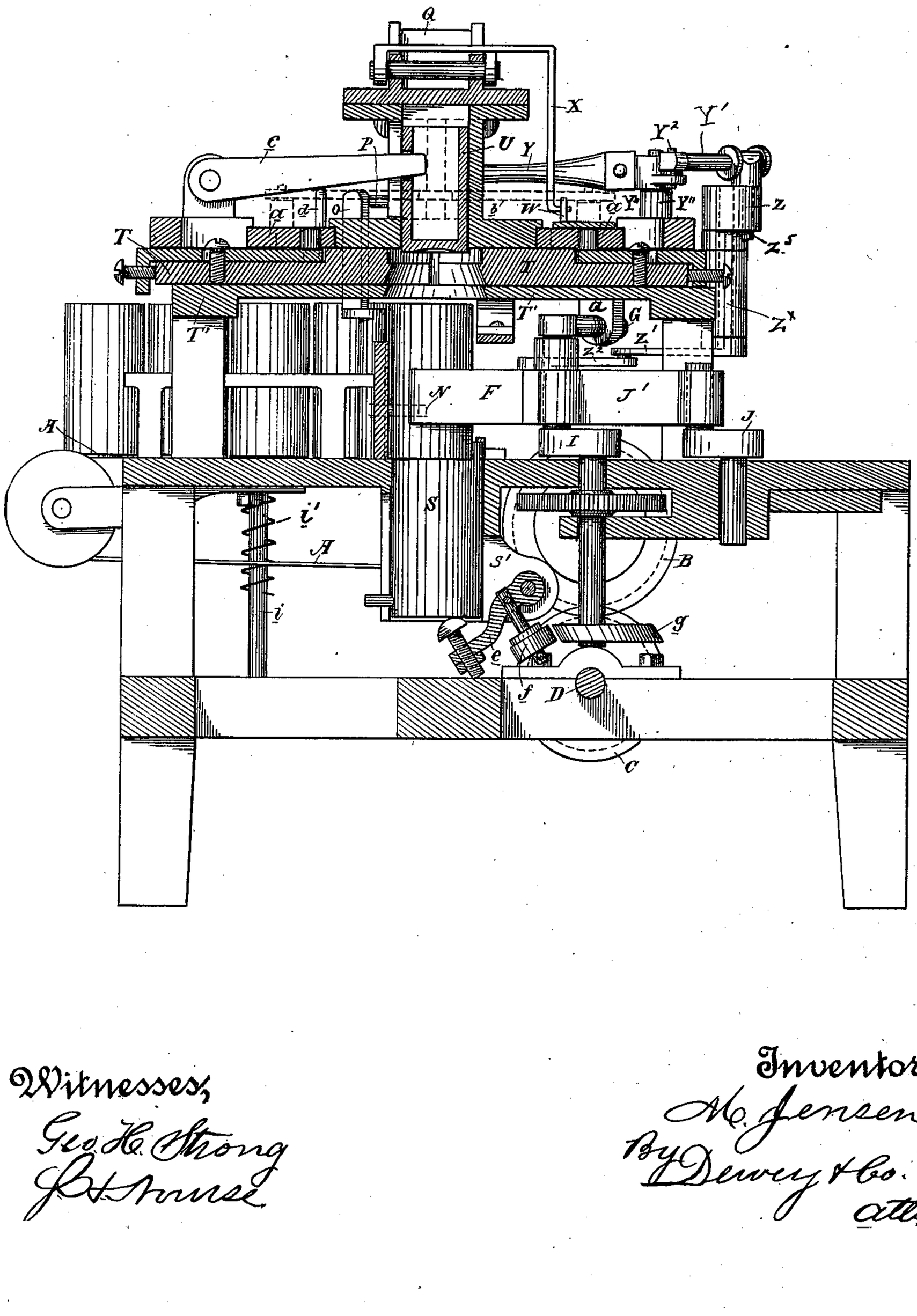
Fig. 2.



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(No Model.) 6 Sheets—Sheet 3.

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CAN CRIMPER AND CAPPER.

No. 376,804. Patented Jan. 24, 1888.

Fig. 3.

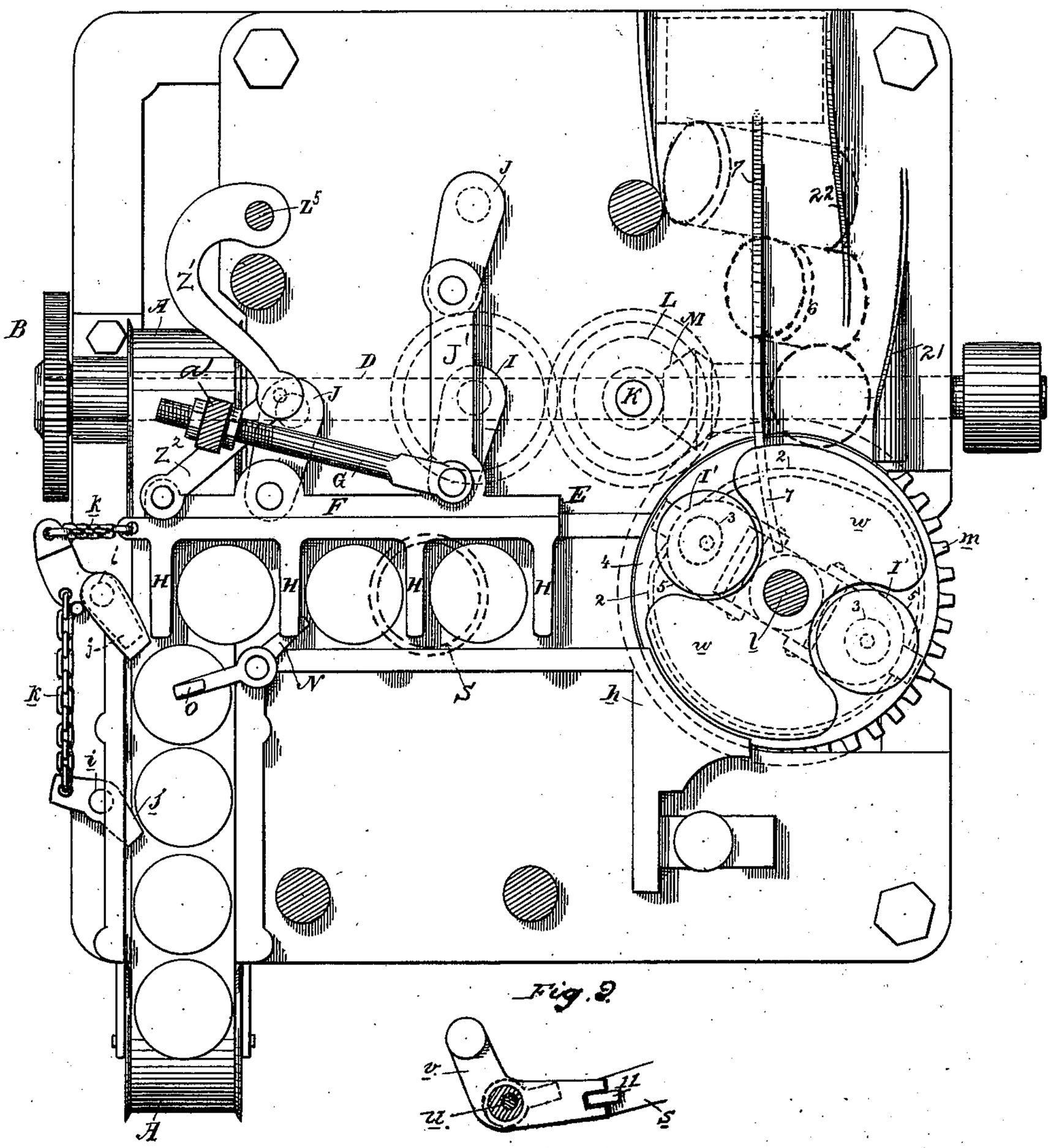

Fig. 2.

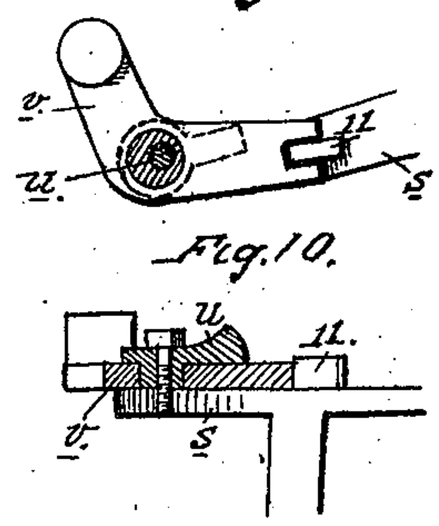

Fig. 10.

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(No Model.) 6 Sheets—Sheet 4.

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CAN CRIMPER AND CAPPER.

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Fig. 4.

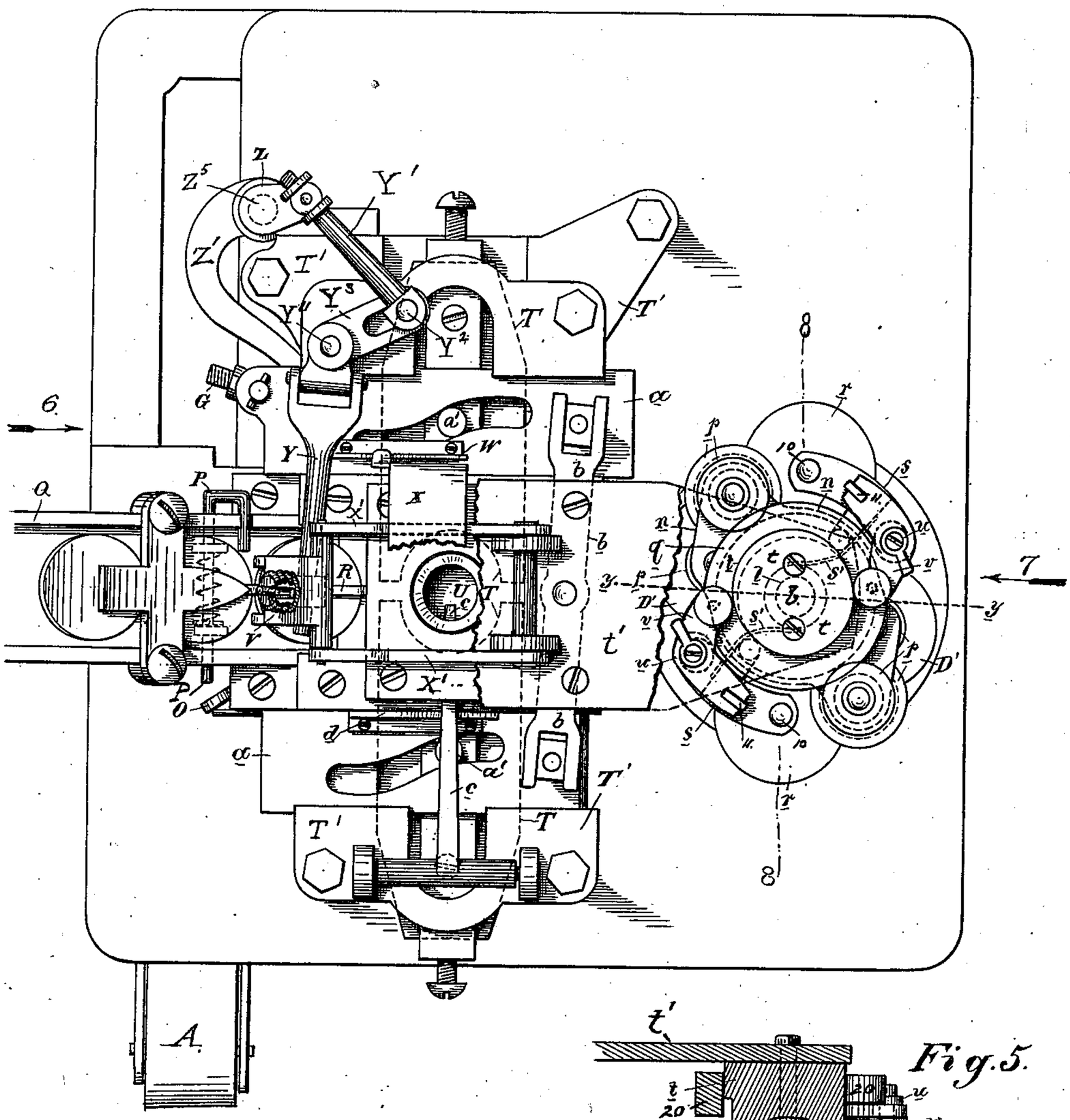
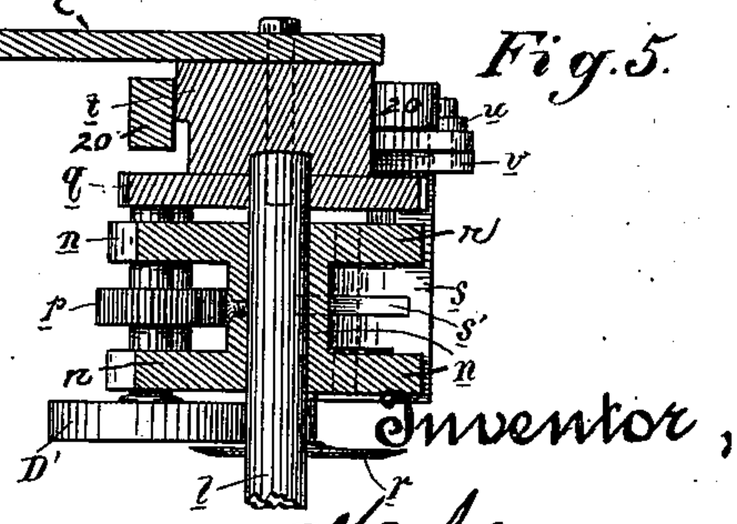


Fig. 5.



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(No Model.) 6 Sheets—Sheet 5.

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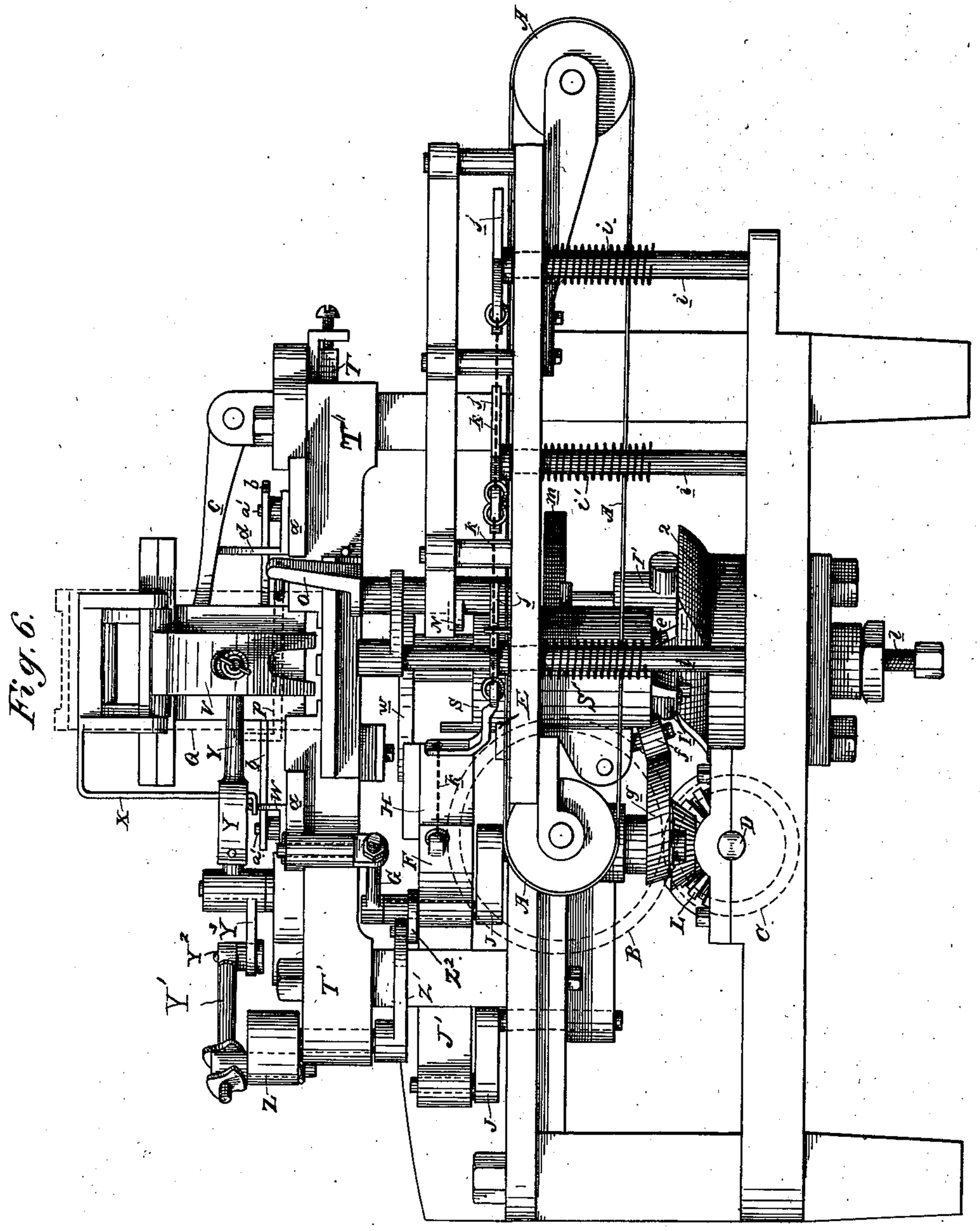
CAN CRIMPER AND CAPPER.

No. 376,804. Patented Jan. 24, 1888.

Fig. 6.



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(No Model.) 6 Sheets—Sheet 6.

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CAN CRIMPER AND CAPPER.

No. 376,804. Patented Jan. 24, 1888.

Fig. 8.

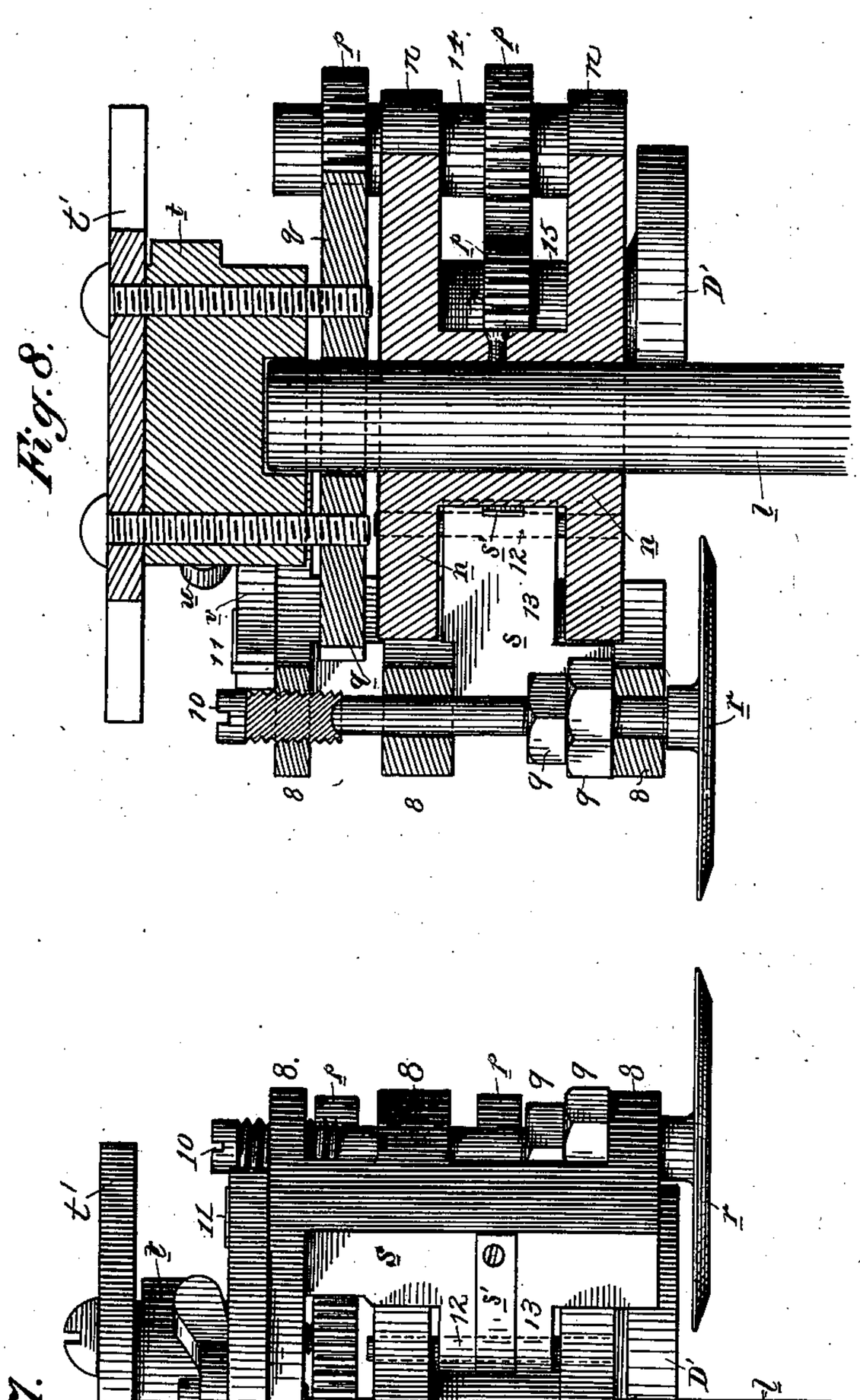
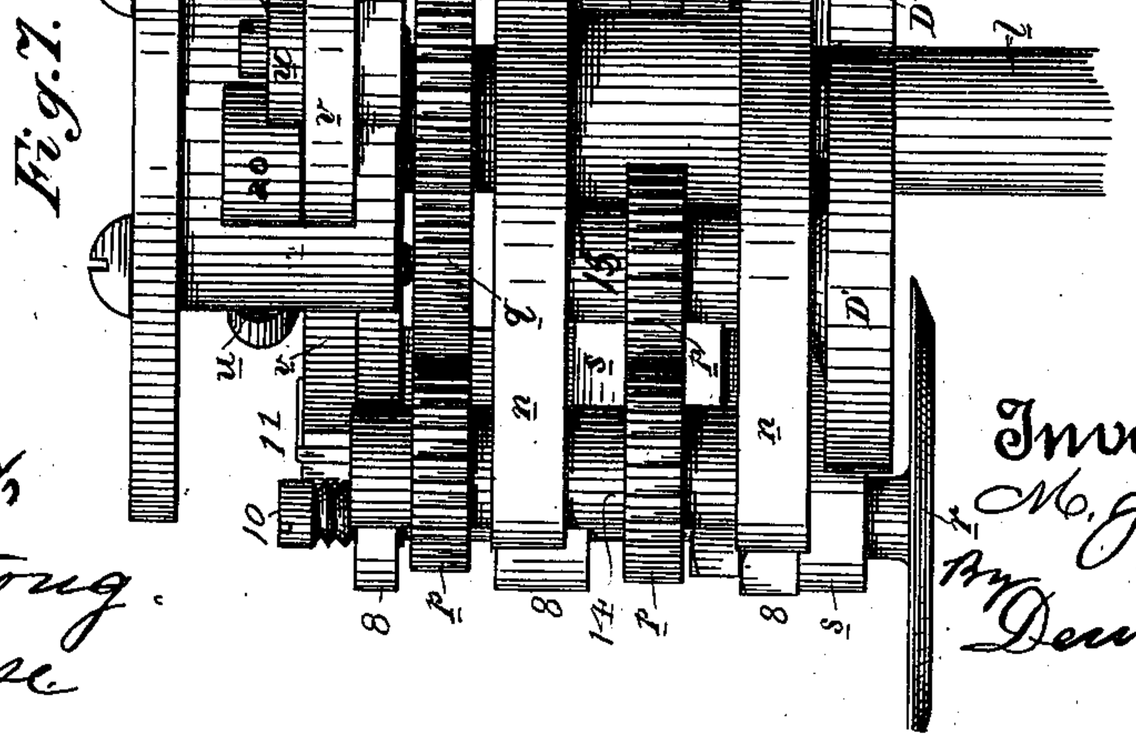


Fig. 7.



Witnesses,
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UNITED STATES PATENT OFFICE.

MATHIAS JENSEN, OF ASTORIA, OREGON, ASSIGNOR OF ONE-HALF TO THE JENSEN CAN FILLING MACHINE COMPANY, OF SAME PLACE.

CAN CRIMPER AND CAPPER.

SPECIFICATION forming part of Letters Patent No. 376,804, dated January 24, 1888.

Application filed January 24, 1887. Serial No. 225,414. (No model.)

To all whom it may concern:

Be it known that I, MATHIAS JENSEN, of Astoria, Clatsop county, State of Oregon, have invented an Improvement in Can-Crimpers and Cappers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a machine for capping and crimping cans; and it consists of certain details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section taken through the plane of the crimper and the feed-chute for the caps and the channel through which the cans are carried from the belt to the crimper. Fig. 2 is a transverse section taken through the axis of the plunger by which the caps are placed upon the cans. Fig. 3 is a horizontal section taken in a plane through the channel in which the cans are transferred from the feeding-belt to the crimper. Fig. 4 is a plan of the parts above line X X of Fig. 1. Fig. 5 is a vertical cross-section of the crimper through line Y Y of Fig. 4. Fig. 6 is a side elevation of the machine, looking in the direction of the arrow 6, Fig. 4, and showing three posts, *i*, instead of two. Fig. 7 is an enlarged side elevation of upper part of the crimping-mechanism in the direction of arrow 7, Fig. 4. Fig. 8 is a vertical section of the same on line 8 8, Fig. 4. Figs. 9, 10, and 11 are details to be hereinafter referred to.

This apparatus is especially intended to receive cans which have been filled with fish or other material, and by means of a belt and a feeder or carrier to transfer them to a point where they receive a cap, and afterward transfer them still farther to a crimper, by which the caps are crimped into place upon the can, the latter being discharged after the completion of the operation and delivered into a conveyer, which carries them to the machine for applying the acid to solder the covers upon them. To carry out this work I employ a feed-belt, A, upon which the cans are delivered in an upright position with their open ends upward. This belt travels above the table of the machine, passing around drums or rollers at each end. The drum at the inner end is mounted upon a shaft having a gear-wheel, B, upon its outer end, and this engages with a gear-wheel or pinion, C, upon the main driving-axle D, which is journaled in the lower part of the frame, and may be driven by a crank or by a belt-pulley or other suitable or convenient contrivance for applying power thereto. Stops or bars E extend across the table at right angles with the belt A, and their ends extend above the belt, so that when the cans reach these bars they are prevented from moving any farther with the belt. They are then taken by the feeder or carrier F and transferred by successive stages across the table, the first stage delivering them upon a rising and falling plunger, S, by which they are raised so that the upper ends of the can will enter the cap, which has been placed in proper position for the operation, while the next stage carries the can across so as to deliver it to the crimper. The feeder or carrier by which these successive movements of the can are produced consists of a horizontal arm, F, extending across the table at right angles with the feed-belt, and having four arms or prongs, H, projecting at right angles from it, and at sufficient distances apart to admit of a can being received between them so as to be transferred by their movements. This arm F is mounted upon the pins of three cranks, I and J J. These cranks have vertical shafts, which are journaled in the frame, and power is applied to move them, so that they produce a circular sweeping motion of the feeder or carrier and the forked arms. By this motion the cans are moved across the table. The motion is obtained by means of the crank I, while the two cranks J J serve as guides to produce a parallel motion. The shaft of the crank I extends downward through the table and has a gear-wheel attached to it, which meshes with another gear-wheel of a second vertical shaft, K. This shaft has a beveled gear-wheel, L, upon the lower end, which is engaged by a similar beveled wheel, M, upon the driving shaft or axle D, and motion is thus communicated to operate this carrier. When a can has been brought by the belt A to the cross or stop bar E, the feeder F will be brought around so that the first two of the forked arms H in

its outward sweep take the can from the belt and push it against the trigger-arm N. The can, pressing against this arm, will turn it and the vertical shaft upon which it is mounted, and this will operate an upwardly-projecting arm, O, which in turn presses against the sliding spring-arm P, the upper end of which is curved or extends into or above the inclined chute Q, in which the caps are placed face downward, and this arm thus stops the caps and prevents their being moved any farther down in the chute until the can has, as before described, moved it by means of the trigger N. The action of the can moving the trigger N, the arm O, and the sliding arm P, releases one of the caps within the chute and allows it to slide down beneath the spring R, which extends down the chute and has its lower end bent so as to rest upon a horizontal table at the bottom of the chute, and thus prevent the cap moving any farther until it is forcibly carried forward by the proper mechanism. The can is carried forward between the second and third arms H of the feeder and is deposited upon the top of a vertically-moving plunger, S, which is operated by a mechanism from below, to be hereinafter described, so as to raise the can and force its upper end between the tapering or conical sides of the guides T', as shown. Above this guide are two slides, T, which will be closed together at this instant to receive the cap. A cap has been taken from beneath the spring R by a suitable mechanism and carried forward and placed in a countersink on top of the slides and above the guiding-cone, which receives the upper end of the can. The cone serves as a guide to bring the can up directly and exactly in line with the cap, and it also serves to compress the fish or material which may project slightly above the top of the can, so that it will be properly inclosed and forced into place when the cap is put on to the can by the action of the moving plunger. When this is completed, the plunger S is depressed, being followed down by the plunger U until the can again arrives at the level of the table, when the can is again seized by the sweeping movement of the feeder, being taken this time between the third and fourth carrying-arms and moved forward toward the crimping mechanism. Two movements of the carrier are necessary to transfer the can from the carrying-belt to the top of the plunger, the first and second arms taking it from the belt, and the second and third place it upon the plunger. It is removed from the plunger between the third and fourth, and is finally placed upon the rotary table by the fourth arm and at the fourth movement of the carrier.

The caps are carried forward from beneath the spring R by means of a swinging forked lever, V, which is fulcrumed in a yoke upon the upper part of the frame, this yoke having its rear end also fulcrumed or pivoted, so that it may be raised by the action of a cam, W, fixed to a sliding bar and reciprocating beneath an arm, X, which is fixed to the yoke X' and projects down at one side, so as to be actuated by the cam. The effect of this cam is to raise the yoke, lifting with it at the same time the forked lever V while it is being carried upward along the chute, so as to drop behind one of the caps and move it forward from beneath the spring R. Through this forked lever a shaft, V'', passes, having a swivel or universal joint on its inner end, which receives the end of a lever, Y, which is so actuated as to swing the forked arm backward and forward. The shaft, which passes through the forked lever V, has a spring upon its outer end, so as to relieve any strain which may come upon the parts during their reciprocation. The forked arm or lever drops by gravitation behind the cap, which is resting against the end of the spring R, its two prongs catching the cap upon each side of the spring, the flexibility of which allows the cap to be forced from beneath it and carried forward into position to be placed upon the can. The lever Y, by which the fork of the cap-moving lever is actuated, is connected through an oscillating vertical shaft, Y^2, to which it is hinged, with a crank, Z, upon the top of a vertical shaft, Z^5, the lower end of which is connected with the feeder F, by means of an arm, Z', and link Z^2, so that the sweep of the feeder will cause the shaft to oscillate, and thus actuate the cap-carrying lever V at the proper time with relation to the movement of the can upon the table beneath. The connecting-arm Y', between the crank Z and the crank which actuates the lever Y, is provided with set-nuts for its adjustment, and the crank-pin with which it connects may also be moved in a slot in the crank-arm Y^3, so as to adjust and regulate the throw of the cap-moving lever. The spring adjustment of the shaft V'', carrying the swivel or universal joint through which motion is directly transmitted to the lever V, allows of a certain movement which enables me to place and hold the caps to their exact place without a direct positive motion, which would be difficult to make exact and keep in order. Before the arm V has moved the cap the feeder F is again on its way with a can from the holding-trigger N over the plunger S, and as soon as the can leaves the trigger N the spring will again have control over the sliding arm or stop P, which is thus drawn into the track of the caps moving down the inclined chute. The feeder F, with the cans on its forward movement, pushes the trigger outward out of the way and therewith the arm O inward against P, overcoming the tension of the spring around P, and thus clearing the track for another cap. The crank-pin of the crank Y' is adjustably secured in the slot of the operating-crank Y^3 by means of a screw-bolt, Y^2, passing through the slot, and having a nut below to screw the whole tight together when in its desired position. By this construction

no caps can come within reach of the arm V until a can is in proper position to receive them.

Above the feeder or carrier F, upon a suitable support, are two slides, *a*, moving in guides parallel with the direction in which the caps move between them from the bottom of the inclined chute to the position where they are placed upon the cans. These slides have inclined or cam-shaped slots made in them, and pins *a'* project upward into these slots from the transversely-moving slides T, which are situated below them, so that as these slides *a* are moved backward and forward they will actuate the transverse slides T, so as to hold the cap above the can until the can has been pushed up into it, after which they are opened to release the cap and allow the can and cap to be depressed, as before described.

The slides *a* are united by a transverse arm or lever, *b*, which connects with pins projecting upward from the slides *a*, so as to engage each end of this oscillating arm, which is pivoted or fulcrumed at the center. One of the slides is connected, by an adjustable connecting-rod, G, with the crank I, by which the sweep of the feeder is produced, so that the slides *a* move simultaneously with the movement of the feeder, and thus operate the transverse slides T, as before described.

The support or frame T', within which the transverse slides T are guided, has a hole conical on its lower face made vertically through it of the same diameter as the outside of the caps to be used.

On top of each of the slides T is a countersunk recess, within which the caps rest upon the lower edges of their flanges. The side of the countersunk recess in each of the slides T toward the entering caps is planed out, so as to allow the caps to pass in when moved forward by the oscillating arm V. Before the feeder-arm H has fully left the can in its first forward movement from the carrying-belt the plunger S will commence to rise with the can on it, the upper end entering the funnel shaped guide just described, through which it is forced until the cap is properly placed. As soon as the upper end of the can enters the cap the slides T are withdrawn, so as to fully clear the cap. The can is then lowered by the plunger S, the plunger U following it down, resting on top of the cap, so as to steady the can while descending. Just as the can is about to stop its downward movement the feeder F will have returned, and with its third arm or fork will carry the can off the plunger, moving it forward toward the crimper. With the next sweep it will move the can with the fourth arm H into the crimping device, and if the cans are properly delivered upon the belt A there will be one taken from there at every revolution of the feeder B, which will receive its cap and arrive at the crimper in its turn, as described. The plunger U is lifted by means of an arm, *c*, which enters its upper end, having its outer end pivoted or fulcrumed upon the frame, so that the lever extends across above the slide *a*, which has an inclined upwardly-projecting lug or cam, *d*, and this cam, moving beneath the lever as the slide reciprocates, alternately raises it and allows it to drop, its descent being caused by gravitation as the cam is removed. The plunger S is raised by the arm *e*, one end of which acts against the bottom of the plunger, the other end being fulcrumed to a fixed support, and having a roller, *f*, turning upon a downwardly-projecting arm or shaft, as shown. This roller is engaged and actuated by a cam, *g*, upon the lower end of the vertical shaft which carries the crank I. The action of this cam upon the arm *e* raises the plunger S, which drops by gravitation, or, if preferred, may have a spring applied, so as to cause it to move with greater activity.

h is a semicircular or curved guide, by which the cans are delivered into the crimper.

i are vertical shafts at one side of the carrying-belt A, having arms *j*, which are caused to swing above the belt by means of spring *i'*, coiled about the vertical shaft *i*, as shown. These arms projecting above the belt control the movements of the cans which may be placed upon the belt, and only allow them to move forward so as to arrive at the feeder F in proper time to be received by it and carried forward. The arms are connected together, and also to the feeder, by chains or other loose connections, as shown at *k*, and the arms are turned back from the belt at the proper time by the movement of the feeder, to allow the cans to be carried forward, so as to be received by it as described.

In crimping the cans the usual method of applying a wheel against the caps on the cans while they are turning is employed. Here two similar crimping devices are carried, one upon each side of a vertical shaft, *l*, which has a gear-wheel, *m*, secured to it, this wheel meshing with a gear-wheel upon the vertical shaft K, before described, which carries the gears by which the capping apparatus is driven.

A support, *n*, is fixed upon the vertical shaft *l*, and the rotating heads D' have their shafts journaled in this support. The lower surfaces of these crimping heads are concave, so as to fit over the top of a can when it is brought beneath them, and the heads are caused to spin or rotate by means of a train of small gear-wheels, *p*, the upper one of which meshes with a stationary gear, *q*, so that as they travel around this stationary gear they are caused to rotate, and thus turn the head, and by its friction or grip upon the top of the can to cause the latter to spin or rotate.

The gearing *p* consists of a shaft, 14, carrying two pinions, the upper one engaging with the fixed gear *q*, the lower one with a pinion on the shaft 15, which carries the wheel D'. The pinions on the shaft 14 transmit the proper movement to the shaft D'.

r are the crimping-wheels, the vertical shafts of which extend upward through three

wings, 8, formed on the bracket *s*. Nuts 9 hold the shaft in its proper position, and the screw 10, entering from the top wing, regulates the revolving of the wheel, as shown in Figs. 1, 7, and 8.

The arms *v*, projecting from the hangers *s*, have rollers 20 upon them, which travel in contact with the stationary cam *t*, while the pivot-pin 12 connects the bracket, by the arm 13, to the wings *n*, the latter being keyed to the shaft I, Figs. 4, 5, 7, and 8. By the action of this cam the hangers are turned so as to move the crimping-wheels against the edges of the caps, which project below the heads D', and as the cans are caused to turn or rotate by the heads these wheels will act to crimp the heads upon the cans. In order to regulate the pressure of the crimping-wheels against the cap, I employ adjusting eccentric collars *u*, which are partly in the arms *v*, carrying the rollers which travel against the stationary cam *t*, as before described. One end of the arms *v* is held by pins 11 to the hangers *s*, said pins being made slightly narrower than the slots to permit the eccentric collars to move the arms *v*. It will therefore be seen that by turning the eccentric the opposite end of the arms carrying the rollers which travel in contact with the stationary cam *t* may be moved out or in, and thus affect the action of the rollers.

w are guides fixed to the vertical shaft *l* of the crimper below the support *n*, so as to revolve with the shaft. These guides have two semi-cylindrical openings to receive the cans and guide them to the crimping-heads.

The arms, forming each side of the openings, are rounded upon their outer ends, so that they may receive the cans while in motion, and also discharge them by crowding them outward. These guides *w*, by reason of the connection of the driving-gear with that which drives the capper, will alternately present themselves at the proper time with relation to the discharge stroke of the feeder F, so that the can will be delivered in each one of the openings in the guide, when it is immediately lifted up with its cap in the crimping-head D', as follows:

Beneath the driving gear-wheel *m* are hinged two arms, I', the hinged ends being toward the center and the outer ends traveling over the fixed cam 2 beneath them, so that they are carried around by the rotation of the vertical shaft to which they are hinged. Within each of the arms I' are fixed spiral springs, and a plate or plunger, 3, rests upon each of these springs, moving vertically in the arms, as shown. The circular table 4, upon which the cans are received, and which is situated just below the guide *w*, has depressions made in its upper surface, and disks 5 fit into these depressions, so that their upper surfaces in a normal position will be level with the surface of the table. These disks have stems extending down through the table and through the driving gear-wheel *m*, which revolves with the table, so that their lower ends rest upon the spring-plungers 3. The cans, which are delivered into the semicircular guides *w*, rest directly upon the disks 5, and as the table and guide rotate the lever-arms I', traveling over the cam 2, are raised up, and through their action the stems of the disks 5 are raised, thus forcing the cap into the spinning or turning head D' above. The springs of the plungers 3 are stiff enough to hold the cans firmly in place, but do not cause any strain by reason of inequality of lengths or other irregularity. Springs S' withdraw the crimping-flanges from the can when the hanger arms are released from the cam E.

The wheel or disk *r* being applied to the cap while the can is spinning, the cap is properly crimped upon the can while the table and guide make a half-revolution, after which the can is delivered from the guides *w* on the table into the discharge-chute 6.

An arm, 7, projects into the space between the guide-flanges, so that when the can strikes this arm the further movement of the guide *w* crowds it out into the chute. This chute, which is formed by the arms 7 and plate 21, has a centrally-disposed plate, 22, as shown in Fig. 3. From this construction it will be seen that the first can is received in the receiving end of the chute in a vertical position, and is advanced along said chute by the succeeding cans. As the second can enters the chute it forces the first can onto the inclined plate 22 in such a manner that said inclined plate strikes the bottom of said can to one side of its vertical center, and thereby tilts it slightly. The succeeding cans now cause the first can to be still further tilted over on its side and against the arm 7, and finally to roll out of the chute into the machine, where the acid is applied and the soldering done, the whole being completed without further handling.

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

1. An endless traveling carrying-belt, a stop, E, extending across it to change the direction of the cans, and arms swinging over the belt, whereby the delivery of the cans from the belt to the feeder is rendered exact, substantially as herein described.

2. The endless carrying-belt upon which the cans are placed, the transverse stop extending over the belt at a point where the cans are received by the feeder, the feeder, and the arms swinging across the belt, so as to stop the cans and determine their time of delivery to the feeder, in combination with connecting links or devices extending from these arms to the feeder, so that they may be moved backward by the movement of the feeder to allow the cans to advance upon the belt, substantially as herein described.

3. In combination with a transverse belt, the feeder having the projecting arms between which the cans are received from the belt and

the actuating devices by which the motions of the feeder are produced, substantially as herein described.

4. In combination with a transverse belt, the capping-table, and crimper, the feeder having the projecting arms to receive the cans and transfer them from the belt to the capping-table and from the capping-table to the crimper, successively, together with the mechanism by which its movements are produced, substantially as herein described.

5. The inclined chute into which the caps are placed and a stop extending across said chute, so as to prevent the caps from moving downward, in combination with a trigger extending across the path of the cans as they are moved toward the capping-table, said trigger being connected with the stop, so that as it is moved backward by the passage of the can it withdraws the stop to allow a cap to move down the chute, substantially as herein described.

6. The inclined cap-carrying chute with the stop and releasing-trigger actuated by the movement of a can toward the capping-table, in combination with the spring-holder R, substantially as herein described.

7. The inclined cap-carrying chute with its stop actuated by the passage of a can toward the capping-table, the cap-holding spring extending below the stop, and the oscillating forked arm by which the caps are removed from the spring and delivered into position to be placed upon the can, substantially as herein described.

8. The inclined cap-carrying chute with its stop, spring, and the feeding-arms, in combination with the transversely-moving slides having the countersink to receive the caps and hold them while the can is being advanced toward the cap, substantially as herein described.

9. The vertically-moving plunger upon which the cans are delivered by the feeder, in combination with the conical guide situated above the cans, and the transversely-moving slides upon which the caps are received and held, with a mechanism by which the slides are withdrawn as the can enters the cap, substantially as herein described.

10. The vertically-moving plunger by which the can is raised to receive the cap, and the guide into which the upper end of the can enters the transversely-moving cap-holding slides, in combination with the second plunger moving vertically above the cap and following it down by gravitation or otherwise, so as to steady the can in its descent after the cap has been applied, substantially as herein described.

11. The vertically-moving plunger upon which the can is received, a carrier for placing the can upon the plunger, and a mechanism by which this plunger is reciprocated vertically in combination with a second plunger, which rests upon the top of the cap and steadies it while descending, and a mechanism for raising the second plunger before the arrival of the next cap, substantially as herein described.

12. The receiving-table and means for removing the cans therefrom, in combination with the vertically-revolving shaft with its driving-gear, the chambered rotating heads for receiving the caps and upper ends of the capped cans, gearing by which motion is imparted to said heads, and the vertically-moving disk by which the can is raised and the cap held within the rotating head, substantially as described.

13. The rotating heads, the shaft *l*, and means for rotating said heads, a table supported on said shaft, and vertically-moving disks carried by said table, in combination with the cams 2 and the lever-arms I′, carried by said shaft, traveling over the cams and raising the disks to force the caps into the rotating heads, substantially as and for the purpose described.

14. The rotating heads, the vertical shaft *l*, means for rotating said shaft and heads, the receiving table on said shaft, and vertically-moving disks mounted in the table, in combination with the hangers *s*, carried by the vertical shaft, crimping-wheels mounted in said hangers, and the cams for operating the crimping-wheels, substantially as herein described.

15. The vertical shaft *l*, the receiving-table thereon, and guiding-plates onto which the cans are received, in combination with rotating heads carried by said shaft, vertically-moving disks mounted in said table and receiving the bottoms of the cans, in combination with the hangers *s*, carried by said shaft, crimping-wheels mounted in the hangers having arms traveling in contact with a cam, an adjusting mechanism for the same, and means for actuating the vertical shaft, rotating heads, and vertically-moving disks, substantially as described.

16. The intermittingly-operating can-feeder, the traveling belt from which the cans are removed by the carrier, a mechanism for feeding the caps and placing them upon the cans, and a crimping mechanism, in combination with a driving-shaft, gearing, and intermediate mechanisms by which the whole are driven in unison with relation to each other, substantially as herein described.

In witness whereof I have hereunto set my hand.

MATHIAS JENSEN.

Witnesses:
C. W. FULTON,
G. C. FULTON.