

(No Model.)

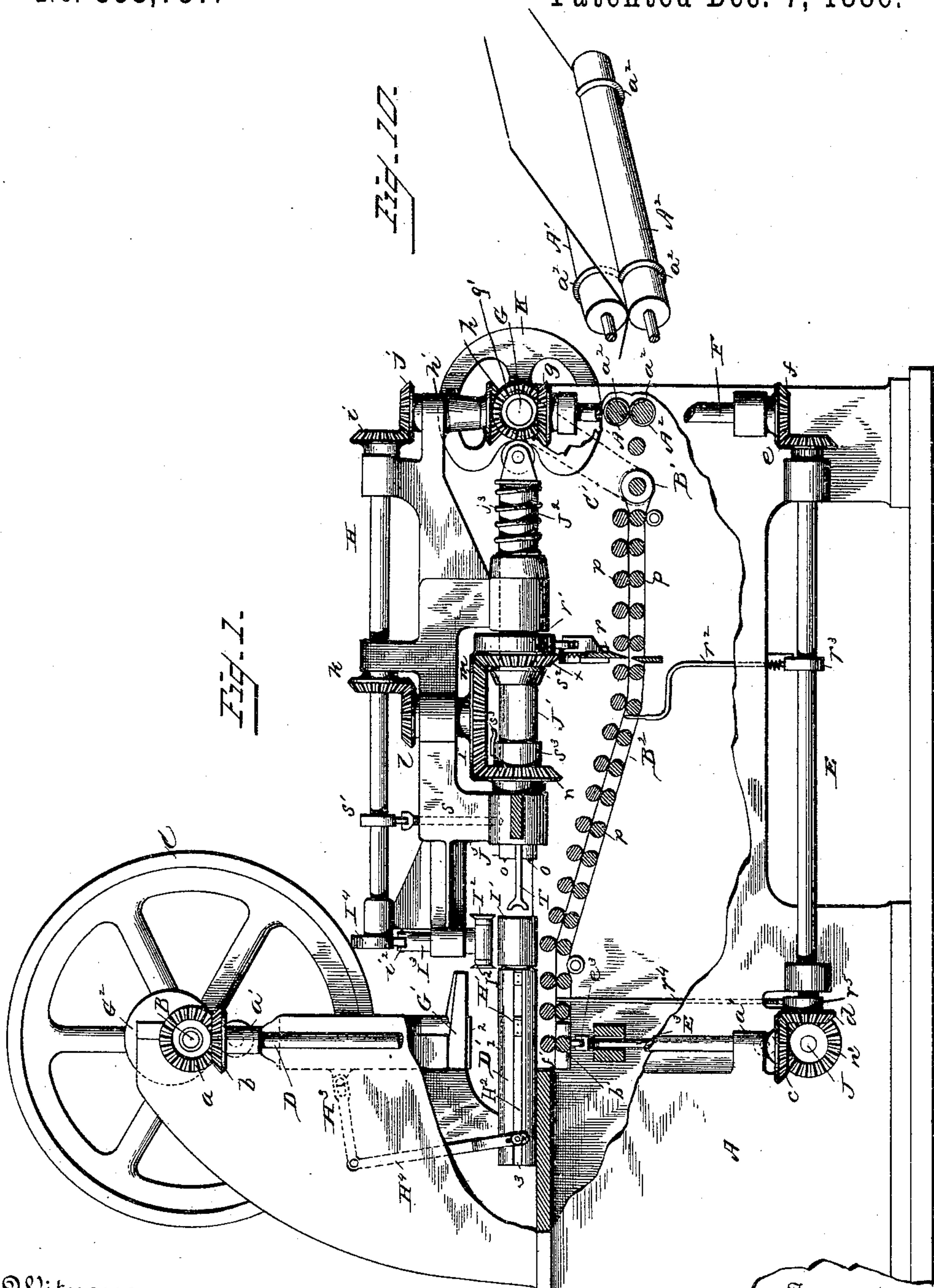
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E. J. DOLAN.

CAN MAKING MACHINE.

No. 353,737.

Patented Dec. 7, 1886.



Witnesses
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Chas. L. Sturtevant

Inventor
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(No Model.)

3 Sheets—Sheet 2.

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Fig. 2.

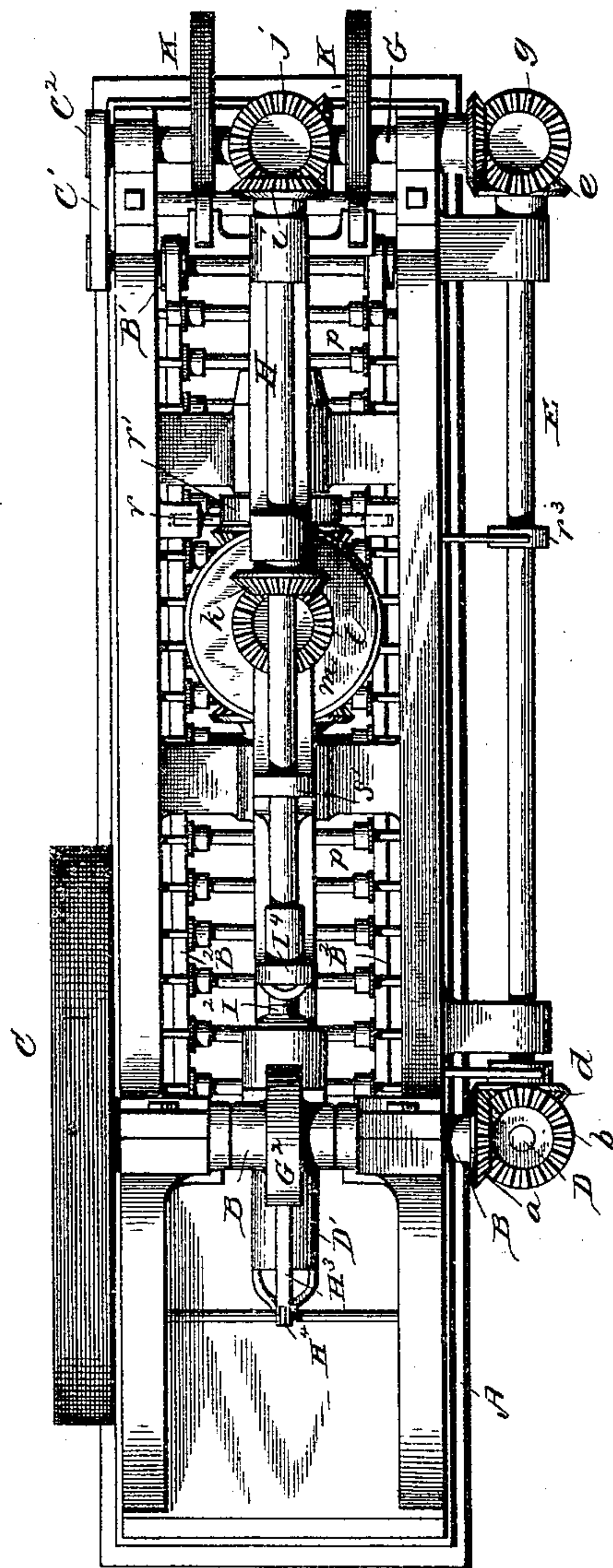
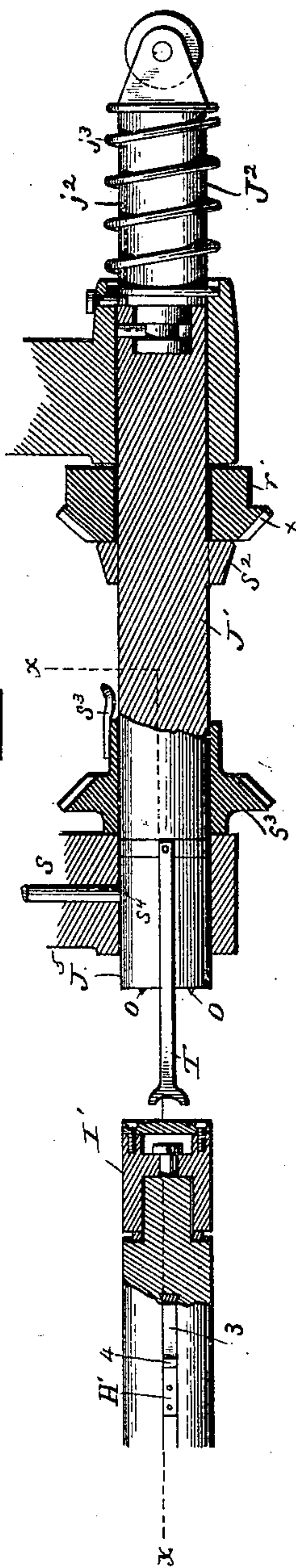


Fig. 5.



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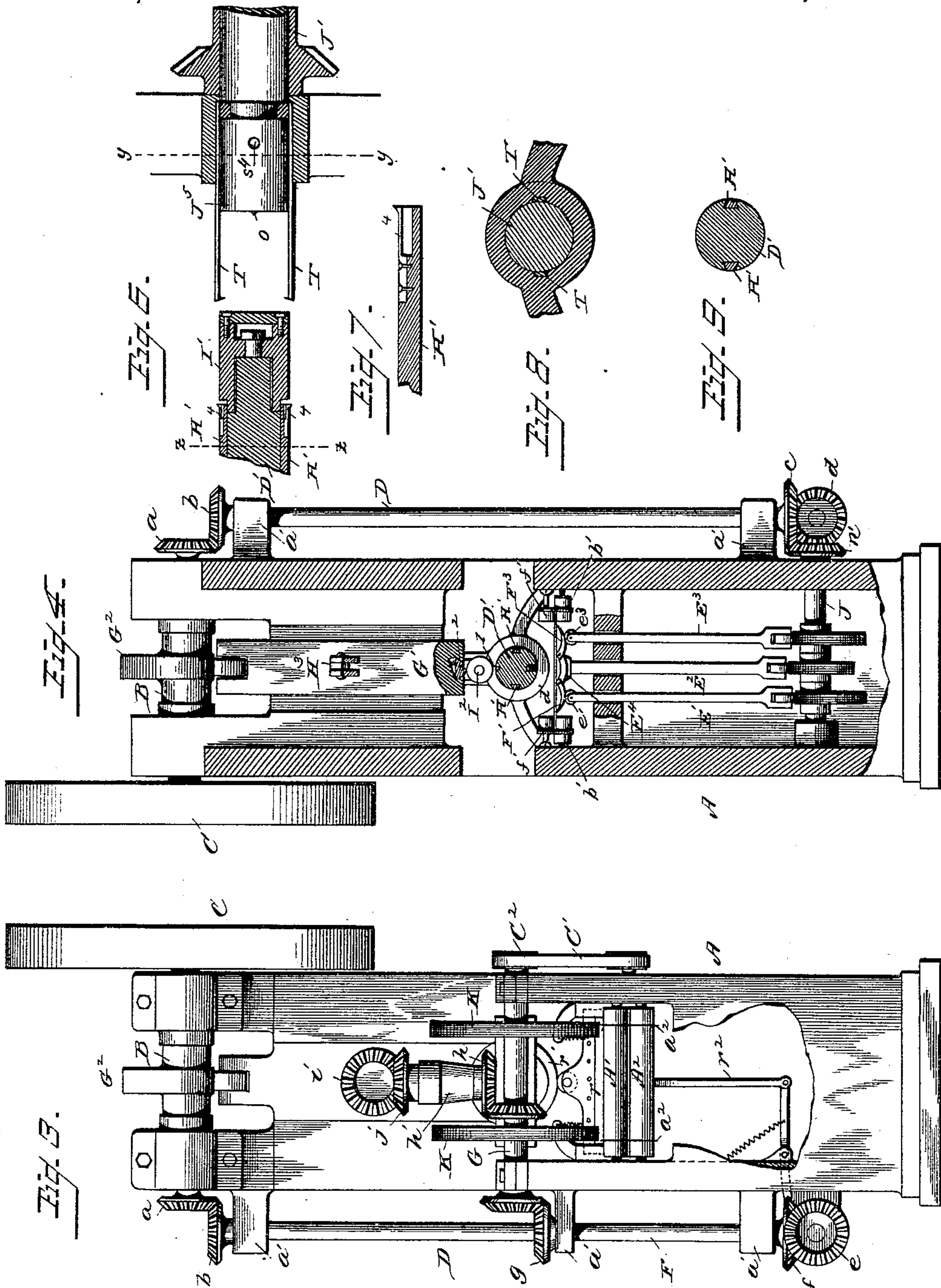
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UNITED STATES PATENT OFFICE.

EDWARD J. DOLAN, OF PHILADELPHIA, PENNSYLVANIA.

CAN-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 353,737, dated December 7, 1886.

Application filed July 17, 1886. Serial No. 208,333. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. DOLAN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Can-Making Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings and letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a side elevation, partly broken away. Fig. 2 is a plan. Fig. 3 is a front end view, shown partly in section. Fig. 4 is a rear end view, partly in section. Fig. 5 is a longitudinal section through the main shaft. Fig. 6 is a horizontal section on the line xx of Fig. 5. Fig. 7 is a detail view of the plunger. Fig. 8 is a cross-section on the line yy of Fig. 6. Fig. 9 is a cross-section on the line zz of Fig. 6. Fig. 10 is a detail of trimming-rollers.

This invention relates to can-making machines, and has for its object to form a complete can automatically in the one machine.

The invention consists in the peculiar combinations and the novel construction, arrangement, and adaptation of parts, all as more fully hereinafter described, shown in the accompanying drawings, and then sought to be specifically pointed out in the claims.

Referring to the drawings by letter, A designates the frame of the machine, B the main shaft, and C a driving-pulley thereon, and to which motion may be imparted from any suitable source of power.

Upon the opposite end of the shaft B is a beveled pinion, a , meshing with the beveled pinion b upon the upper end of the vertical shaft D, which is journaled in suitable brackets, a' , upon the frame and carrying upon its lower end the beveled pinion c .

E is a horizontal shaft suitably journaled near the bottom of the frame, and carrying upon one end a beveled pinion, d , meshing with the pinion c on the shaft D, and at its other end the beveled pinion e , meshing with the beveled pinion f , carried upon the lower end of the shaft F, which carries at its upper

end the beveled pinion g , which in turn meshes with a beveled pinion, g' , on the shaft G. This latter pinion meshes with the pinion h , carried by a vertical shaft suitably journaled in the brackets h' on the frame of the machine, and carrying at its upper end the beveled pinion j , meshing with the beveled pinion i on the horizontal shaft H, which is suitably journaled in the frame and carries near the center of its length the beveled pinion k , meshing with the beveled pinion l on the vertical shaft I, which carries at its lower end the beveled pinion m .

J' is a transverse shaft carrying loosely upon one end a beveled pinion, n , meshing with the pinion m , just described, and J is a shaft carrying at one end the pinion n' , meshing with the pinions c and d , as shown in Figs. 1 and 4.

Suitably journaled at the front end of the machine are the trimming-rollers $A' A^2$, provided near their outer ends with cutters a^2 , which trim the sheet of tin to the proper width as it passes between them.

B' is a roller suitably journaled at the rear of the trimming-rollers, and b is a suitable roller journaled at the rear end of the machine.

B² is an endless belt passing around the outer ends of said rollers. Motion is imparted to said belt by means of the belt C', passing around the roller B' and a roller, C², on the shaft G.

D' is the seaming cylinder, around which the blank is formed and seamed in any suitable way. One convenient means is shown in Fig. 4, in which d' is the blank; D', the cylinder; E', E², and E³, upright bars operated by cams on the shaft E. The pushing-bars E' E³ are provided with friction-rollers $e' e^3$, respectively. The bar E² has a convex bearing-surface, E⁴, to accommodate a portion of the circumference of the cylinder D'.

F' F³ are convex jaws or wings hinged upon opposite sides of the bearing E⁴, which, when the bars E' E³ are forced upward, clamp the blank around the cylinder, after which the seaming is done in the following manner: The cylinder D' is provided upon its upper surface with an oblique recess or die, 1, and the plunger C' carries the follower 2, which, when it descends, forces the blank into the recess or die 1, the shape of which it then as-

sumes. The shafts of the rollers f' are pivoted in any suitable way so as to allow of their readily yielding upward to permit the upward movement of the blank by the jaws $F' F^3$, as clearly shown in Fig. 4.

After the edges of the blank have been folded to form the seam the plunger G' is caused to ascend by means of springs (not shown) arranged within the bearings, which movement of the plunger, through the medium of the links $H^3 H^4$, forces forward the plunger H' on the end of the horizontal rods H^2 . The cylinder D' is formed with longitudinal recesses 3, from which project the springs 4, which serve to press against the edge of the rear end of the body of the box, and in the further movement of the plunger H' the box is forced forward upon the crimping-cylinder I' , where the crimping on of the bottom is done.

I^2 are idle crimping-rollers carried by the plunger I^3 , which is provided with a friction-roller, i^2 , and operated at proper intervals by the cam I^4 on the shaft H .

Motion is imparted to the shaft J' from the shaft H by means of the pinions $k l$, shaft I , and pinions $m n$.

The shaft J' is adapted to be moved longitudinally forward at proper intervals by means of the cam K upon the shaft G . The portion J^2 , which is a section independent of the remainder of the shaft, is prevented from revolving by means of a longitudinal groove, j^2 , upon its outer surface, which engages with a corresponding pin upon the inner surface of the journal-box within which it moves. The return of the shaft, after the same has been moved forward by means of the cam K , may be provided for by any suitable arrangement of springs, as j^3 , adapted to accomplish the purpose. The end J^5 of the shaft J' is provided with points or projections $o o$, adapted to engage with corresponding recesses in the end of the cylinder I' . This construction is clearly shown in Fig. 5.

In operation the sheet of tin from which it is desired to construct the body of the box is passed between the cutting-rollers $A' A^2$, where it is trimmed by the collars or cutters a^2 to the proper width. From this point the strip passes between the friction-rollers $p p$ and is carried to the knife r , operated by means of the cam r' upon the shaft J' . x is a beveled pinion loose on the shaft J' and formed integral with the cam r' , the object of which construction will be hereinafter described. The sheet is caused to stop at the proper point by means of the stopping-pin r^2 , which is forced upward by means of its engagement with the cam r^3 upon the shaft E . The tin sheet having been cut to the proper length, the stop r^2 is withdrawn and the sheet continues its course between the friction-rollers until it reaches a point directly beneath the seaming-cylinder D' , around which it is bent and the edges seamed, as heretofore described, and is thence forced forward upon the cylinder I' by the mechanism above de-

scribed provided for this purpose. r^4 is a stopping-pin operated by the cam r^5 on the shaft E , which cam is so arranged as to project the said pin at proper intervals to stop the sheets of tin and prevent them from crowding one upon the other, and allow one of said sheets to be bent around the cylinder D' before the next sheet reaches the bending-jaws.

A circular piece of tin of suitable size to form the bottom of the can is placed over the end J^5 of the cylinder J' , where it is held by the projections $o o$ of the shaft J , and with the next successive forward movement of the shaft J' it is securely clamped against the end of the cylinder I' and held securely in position by means of the projections $o o$ upon the end of the shaft, J^5 . The crimping-rollers I^2 are then forced downward, and the roller at the right of the machine, engaging with the edge of the disk of tin thus held in place against the end of the cylinder, serves to securely crimp the same in place, thus forming the bottom of the can, and the other roller, I^2 , serves to prevent the can-bodies from being forced from the cylinder J' , although this latter roller is not necessary, and may be sometimes omitted.

In order that the shaft J' may be stopped in its revolution, so as to secure an engagement of the points o with the corresponding openings in the end of the cylinder I' , a pin, s , is provided, which is caused, by reason of its engagement with the cam s' on the shaft H , to enter a hole, s^4 , in the upper surface of the shaft, J^5 . At the time of such engagement of the pin s with the hole s^4 the forward movement of the shaft J' causes the beveled portion s^2 of said shaft J' to frictionally engage with the clutch s^3 , thus causing it to rotate with the pinion n , which is in engagement with the pinion m on the shaft I .

The construction and operation of this clutch mechanism will be best understood by referring to Figs. 1 and 5, in which it will be seen that the portion s^2 is formed integral with the shaft J' , and of course revolves with it, while the pinion n , carrying the clutch s^3 , the beveled pinion x , and cam r' , are sleeved loosely upon said shaft. The beveled pinion x is formed integral with the cam r' , as clearly shown in Fig. 5. When the shaft J' is forced forward by the cam K , the beveled portion s^2 engages the clutch s^3 , causing said shaft to revolve with the pinion n . The engagement of the beveled pinion x with the pinion m causes the cam r' to actuate the knife r at proper intervals.

The bottom of the box having thus been securely clamped in place, the pin s is disengaged from its engagement with the shaft J^5 by means of a spring, (not shown,) and at the same time the beveled portion s^2 of the shaft is, by means of the spring mechanism heretofore referred to, withdrawn from its engagement with the clutch s^3 , and the beveled pinion n being again thrown into engagement with the pinion m , the shaft is allowed to revolve, and the bottom of the can is crimped securely in place by means of the idle-roller I^2 . The box which has thus

been completed still remains upon the cylinder I', and is removed therefrom by means of an attachment to the shaft J', which is clearly shown in Fig. 5 of the drawings.

5 T represents flat strips of spring metal, one of which extends along upon each side of the shaft J', within suitable grooves formed in the bearing, as shown in Fig. 8. The end of each of these spring-strips T is provided with hooks
10 adapted to spring down over the edge of the can. The can being thus grasped by the spring-strips T, the box is drawn off from the cylinder I' by the return movement of the shaft J', as will be readily understood.

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

1. The combination, with the trimming-rollers and forming and seaming devices, of
20 an endless carrier arranged between said trimming-rollers and forming and seaming devices, and a vertically-operating knife arranged to divide the sheet into proper lengths as it passes over said carrier, substantially as described.

25 2. The combination, with the trimming-rollers and forming and seaming devices, of an endless carrier arranged between said trimming-rollers and forming and seaming devices, a vertically-operating knife arranged to divide
30 the sheet into proper lengths as it passes over

said carrier, and a stop arranged in advance of said knife, substantially as and for the purpose specified.

3. The combination, with the trimming-rollers and forming and seaming devices, of
35 an endless carrier arranged between said trimming-rollers and forming and seaming devices, a vertically-operating knife arranged to divide the sheet into proper lengths as it passes over
40 said carrier, and two stops arranged between said knife and the forming and seaming devices, substantially as and for the purpose specified.

4. The combination, with the cylinder I', of a vertically-reciprocating plunger, an idle
45 crimping-roller carried thereby, and a horizontally-reciprocating bottom-clamping device provided with means for removing the finished can, substantially as described.

5. The combination, with the cylinder I', of the plunger I³, provided with friction-roller
50 I², the idle crimping-roller I², carried by said plunger, the shaft H, and the cam I⁴ on said shaft, substantially as and for the purpose specified.

In testimony whereof I affix my signature in
55 presence of two witnesses.

EDWARD J. DOLAN.

Witnesses:

CHAS. L. STURTEVANT,
ALFRED T. GAGE.