(No Model.) 3 Sheets—Sheet 1.

J. SOLTER.

CAN MAKING MACHINE.

No. 577,459. Patented Feb. 23, 1897.

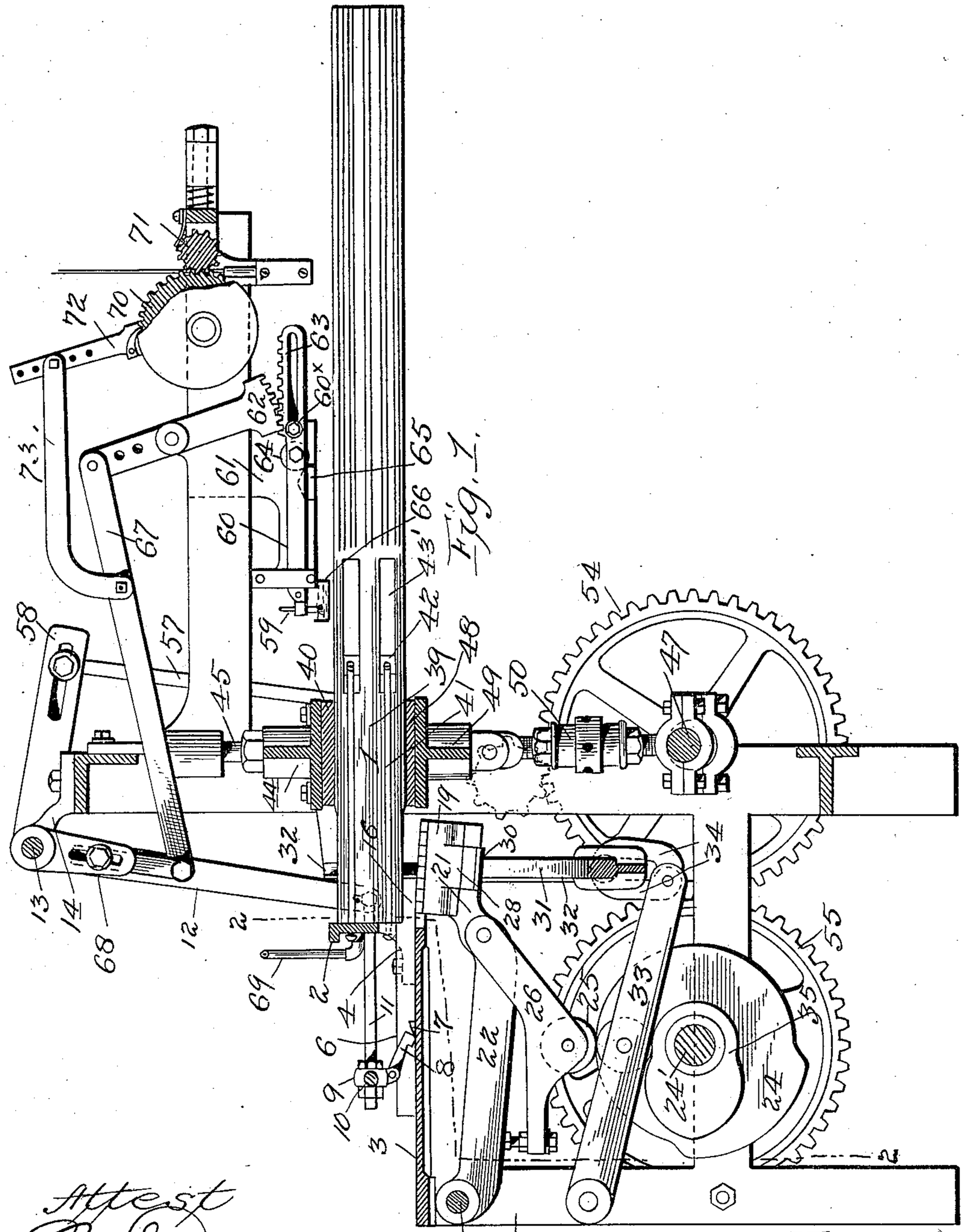

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

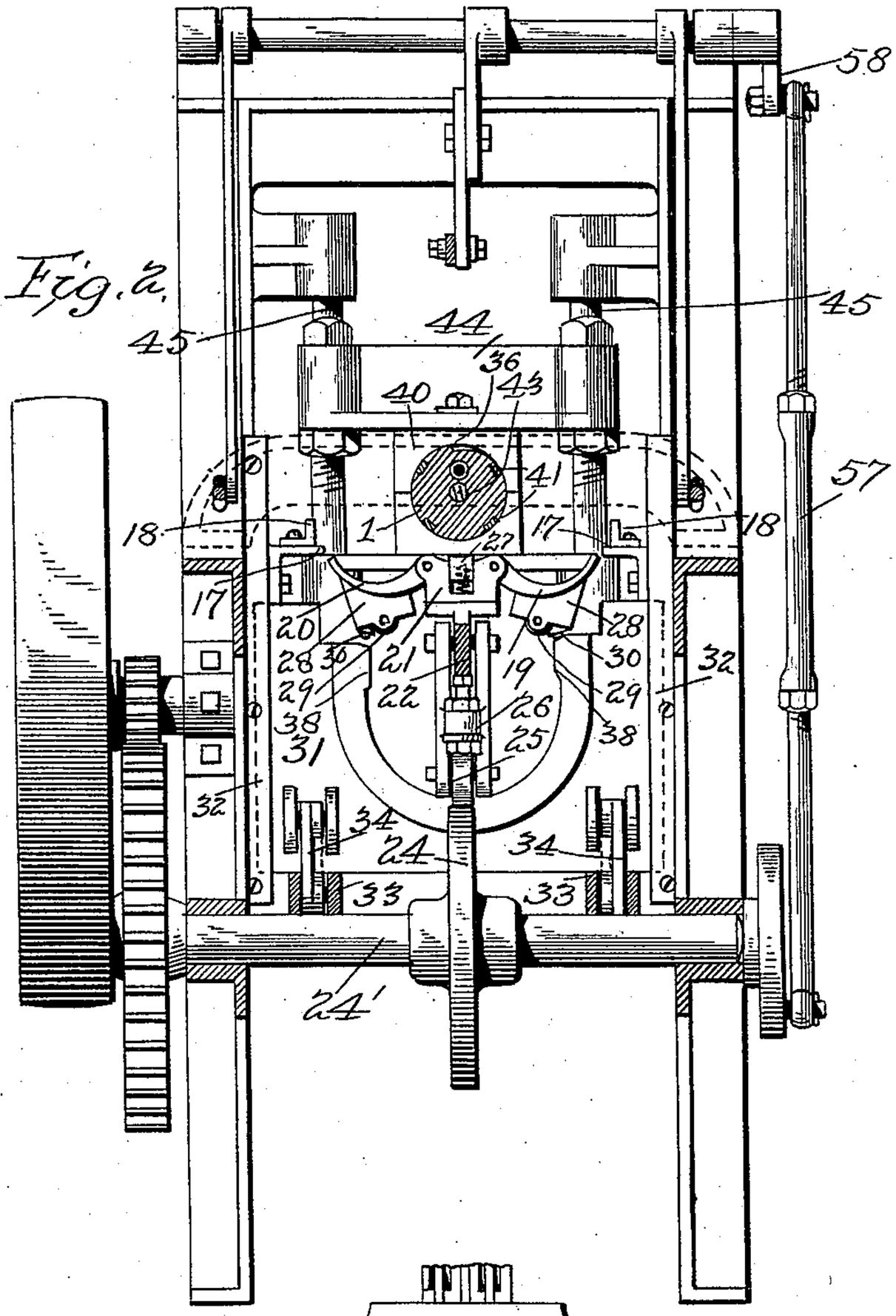
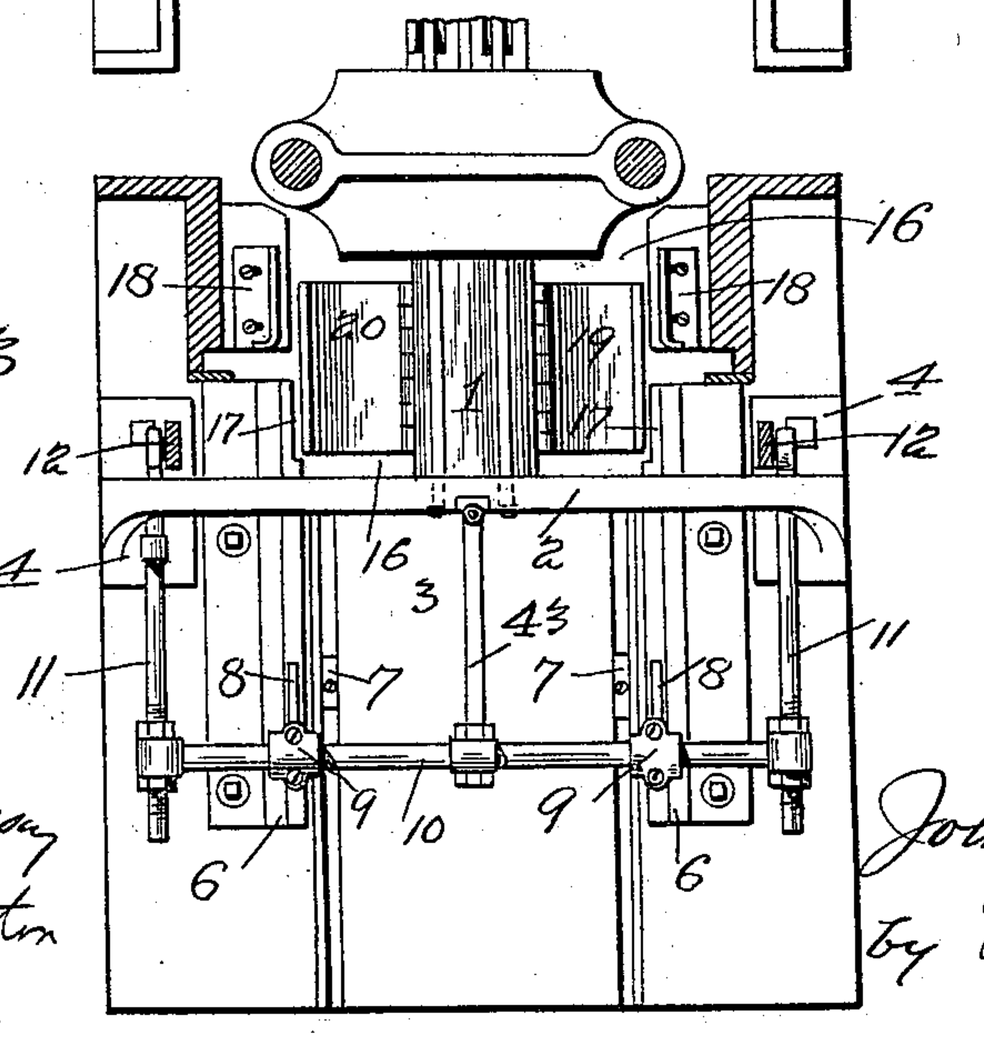


Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

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CAN MAKING MACHINE.

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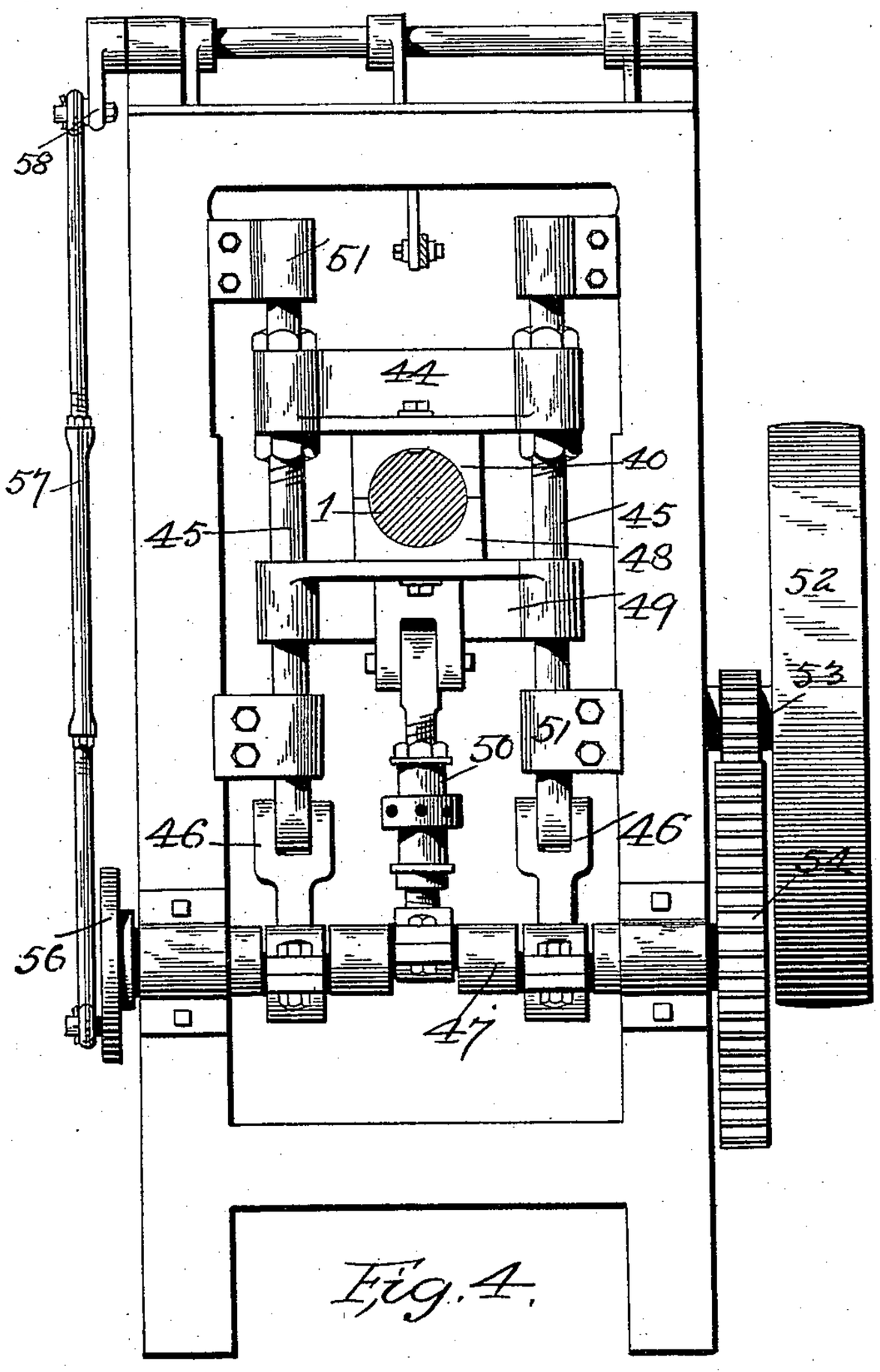

Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN SOLTER, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF TO GEORGE L. KREBS, OF SAME PLACE.

CAN-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 577,459, dated February 23, 1897.

Application filed September 12, 1896. Serial No. 605,659. (No model.)

To all whom it may concern:

Be it known that I, JOHN SOLTER, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Can-Making Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to the form of machine for making can-bodies described and shown in the application for United States Patent, Serial No. 580,803, filed February 26, 1896.

In my present machine I have applied mechanism for automatically feeding the flat blanks to and for folding them automatically about the mandrel, the folders being so controlled by the automatic mechanism as to insure the interlocking of the edges of the blanks which have been previously broken or bent.

In the accompanying drawings, Figure 1 is a side view of the mandrel with the operating mechanism and frame partly in elevation and partly in section. Fig. 2 is a sectional view on line 2 2 of Fig. 1 with parts omitted. Fig. 3 is a detail plan view of the feed-table and terminal extension of the mandrel with the folders in place. Fig. 4 is a rear view of the seaming-dies and operating mechanism.

In the drawings the mandrel 1 is of cylindrical form and is supported at its front end by being bolted to a cross-truss 2, extending in arch form over the feed-table 3 and having downturned end portions 4 bolted thereto, the said feed-table being supported by the main frame 5.

The flat can-body blanks, which have previously had their edges broken in the ordinary manner, are laid one by one by the operator upon the feed-table 3 between the guides 6 thereon and with their front edges in rear of the stop-pieces 7, which prevents retraction of the blanks. The front edges are engaged by the feed-fingers 8, pivoted to blocks 9, secured on a cross-bar 10, which is carried by rods 11, working through guide-openings in the cross-truss and reciprocated by levers 12, extending down from a rock-shaft 13, journaling in bearings 14 at the top of the frame. The blank, when pushed to the rear by the feed-fingers, moves below the transverse truss and under the end of the mandrel, which is supported at a slight distance above the plane of the feed-table. At the limit of the rearward movement the blank is left above an opening in the table at 16, its edges, however, resting upon the ledges 17 adjacent to the opening, and supplemental guides 18 being provided on the table to further guide and insure the accurate position of the blank. In this position the flat blank is directly above the automatic folding mechanism, which consists of wings 19 20, pivoted to a block 21, which is raised and lowered to clamp the blank to and release it from the mandrel by a lever 22, which carries the block rigidly and which is pivoted on a cross-bar 23 of the frame. The lever is raised to set the clamp-block against the blank and hold it to the mandrel by a cam 24 on a shaft 24′, journaled in the frame, said cam acting upon a roller 25, carried by an arm 26, pivoted to the lever 22 at its rear end and having a forward extension with an adjustable bolt bearing on the under edge of the lever 22. By this the throw of the lever 22 may be accurately adjusted to suit different materials or to compensate for wear.

The clamp-block has a yielding section 27, which bears against the blank and by its yielding pressure prevents straining of the parts. When the clamp-block is raised, the blank is held firmly to the mandrel centrally of its under side and then the wings are swung to fold the projecting edges about the mandrel.

With this machine, as before stated, blanks are used which have had their edges previously broken, and it is my object to simply fold the blank and interlock its edges automatically about the mandrel at one point and then to complete the seam by simply moving the body-blank to another point, where its interlocked edges are formed into a complete seam. For this purpose the mandrel at the point where the folders operate is reduced in diameter, so that the body may be folded loosely about it in order that one bent edge may slip over the other edge to be interlocked therewith when the folders retract. This reduced portion of the mandrel forms the terminal extension thereof, under which the blank is first fed, as above stated. The fold-

ers are curved to conform to the curve of the completed can-body, and they have blocks 28 on their under sides carrying rollers 29 and wear-pieces 30. They are raised immediately after the clamp is set by a cross-head 31, moving in guideways 32 of the frame and operated through a double lever 33, pivoted at the front of the frame and having its rear ends connected with the sliding cross-head by links 34. This double lever is operated by cams 35 on the cam-shaft, only one of which is shown in Fig. 1.

As shown in Fig. 2, the position of the bearing-surfaces of the cross-head relative to the wear-blocks and rollers of the folding-wings is such that in the upward movement of the cross-head the wing 19 on the right of Fig. 2 will be operated first, thus getting the underlapping edge into position against the stop-shoulder 36 of the mandrel, and the movement of the wing 20 continues after that of 19 has ceased, so that the overlapping edge will be made to slip or snap over the underlapping edge to get into position for the interlocking action. This difference in movement, it will be noticed from Fig. 2, arises from the fact that the bearing-surface on the right cross-head is higher and in contact with the block of the wing 19, while that on the left does not come into contact with its wing 20 until the wing 19 has been partially folded, owing to the fact that the bearing-surface on the left is lower down than that on the right. When the wings are completely folded, their rollers move on the vertical surfaces 38, and thus the wing first folded may remain in position to hold the blank while the other wing is completing its folding movement. When the folders retract, the natural spring of the metal of the blank will cause the overlapping edge thereof which has snapped over the underlapping edge to interlock therewith. The clamp-block remains in contact with the blank until after the folding-wings retract.

After the edges are interlocked the wings fall away, and the body-blank, loosely held by the reduced terminal extension of the mandrel, is ready to be moved to the rear onto the part of the mandrel 39 of the full diameter and under the seaming-die 40. In this movement the blank is expanded to its full diameter and its edges are completely locked, ready for the seaming operation. This rearward movement to the blank is given by feed-slides 41, similar to those used by me heretofore, which move in grooves in the side of the mandrel and are connected to a cross-head 42, reciprocated from the feed mechanism by a bar 43′, extending centrally through the mandrel and connected with the cross-bar 10. The mandrel is slotted at 43, as in my case above referred to, to permit proper connection to be made between the feed-slides and the cross-head.

The die mechanism for completing the seam is substantially the same as that described in my former application, and it includes a die 40, carried by a cross-head 44, operated through rods 45 and links 46 from a crank-shaft 47, arranged near the bottom of the frame. A thrust-block 48, carried by a cross-head 49, guided on the rods 45, is operated simultaneously with the die by an adjustable link connection 50 with the crank-shaft. The rods 45 reciprocate in guides 51 on the frame. The die and thrust-block are by this mechanism operated in opposition to each other. The crank-shaft is operated from the driver-pulley 52 and gears 53 54, and the latter gear operates the cam-shaft through a gear 55. A face-plate 56 on the crank-shaft operates the rock-shaft 13 through the pitman 57 and arm 58. I simplify the driving mechanism by thus placing the crank-shaft at the lower part of the frame and by connecting it through gearing with the cam-shaft.

From the seaming-die the body-blank is moved to the rear by the movement of the new blank abutting thereagainst, and in this movement it passes under a fluxing device, which applies flux to the seam by means of a brush 59, carried on an arm 60, which is reciprocated in guides on a supporting-bracket 61 by a segment 62, pivoted to said bracket and engaging rack-teeth 63 on the rear end of the arm 60. This arm carries a roller 64, which by sliding on a cam 65, having double inclines, gives to the arm a rising-and-falling movement as it reciprocates. This movement will raise the brush out of the flux-pan 66 and lower it onto the seam and then return it to the pan again for a fresh supply of flux. The segment-lever is oscillated through a link 67, connected thereto, and an arm 68 on the rock-shaft 13. The rear end of the arm 60 is slotted, and one of the guides 60× passes through this.

In this machine I employ burners within the mandrel, which, as in my former application, play directly upon the inner side of the seam through a slot in the mandrel. I have not shown such burners, but simply indicated the gas-pipe at 69 for leading the gas thereto.

The solder-feed wheels 70 71 are the same as in my former case, the wheel 70 being operated step by step through a pawl-lever 72 and a link 73, connected at its forward end to the link 67.

I claim as my invention—

1. In combination the mandrel having a reduced extension, and a pair of folding-wings pivotally supported and adapted to fold a blank of flat form about the reduced part of the mandrel and means for operating the wings, the edges of the blank being interlocked by the retraction of the wings, substantially as described.

2. In combination the mandrel having a reduced extension, a seaming-die operating at the part of the mandrel of the full diameter, the pivoted folding-wings, operating against the reduced part of the mandrel and operating means therefor to permit the retraction of

one wing in advance of the other to interlock the edges of the can-blank, substantially as described.

3. In combination the seaming-die, a mandrel having a reduced extension beyond the same and adapted to permit the feeding thereto of a flat can-body blank and means for folding said blank from its flat form about the reduced extension and for interlocking the seam, substantially as described.

4. In combination the seaming-die, a mandrel having a reduced extension and pivoted folding-wings operating at the reduced extension, substantially as described.

5. In combination the seaming-die, a mandrel having a terminal extension beyond the die of reduced diameter adapted to permit the feeding of the blanks directly thereto and folders operating at the said reduced terminal extension, substantially as described.

6. In combination the seaming-die, the mandrel having the reduced extension beyond the same, the folders operating at said reduced extension, and means for feeding the blanks automatically between the reduced extension and the folders, substantially as described.

7. In combination the feed-table, the cross-truss extending in arch form over the same, the mandrel having its forward extension secured thereto, the folders arranged to operate on said extension, the seaming-die in rear of said extension, and the feed mechanism operating over the folding-table, substantially as described.

8. In combination the mandrel, the pivoted folders, the clamp-block carrying the same, the lever carrying the clamp-block, the cross-head for operating the pivoted folders and means for operating the lever and cross-head, substantially as described.

9. In combination the die and thrust-block, the mandrel, the folding mechanism, the cam-shaft and cams for operating the folding mechanism, the crank-shaft for operating the seaming-die and thrust-block, and the gearing between the said cam and crank shafts, substantially as described.

10. In combination the mandrel, the seaming mechanism, the flux-brush, the arm for carrying the same having the rack, the segment for reciprocating the arm and the cam having the double incline, substantially as described.

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

JOHN SOLTER.

Witnesses:
GEO. E. TAYLOR,
JOHN R. MITCHELL.