(No Model.) 3 Sheets—Sheet 1.

C. F. HINTZE.

FOLDING MACHINE.

No. 410,098. Patented Aug. 27 1889.

Fig. I.

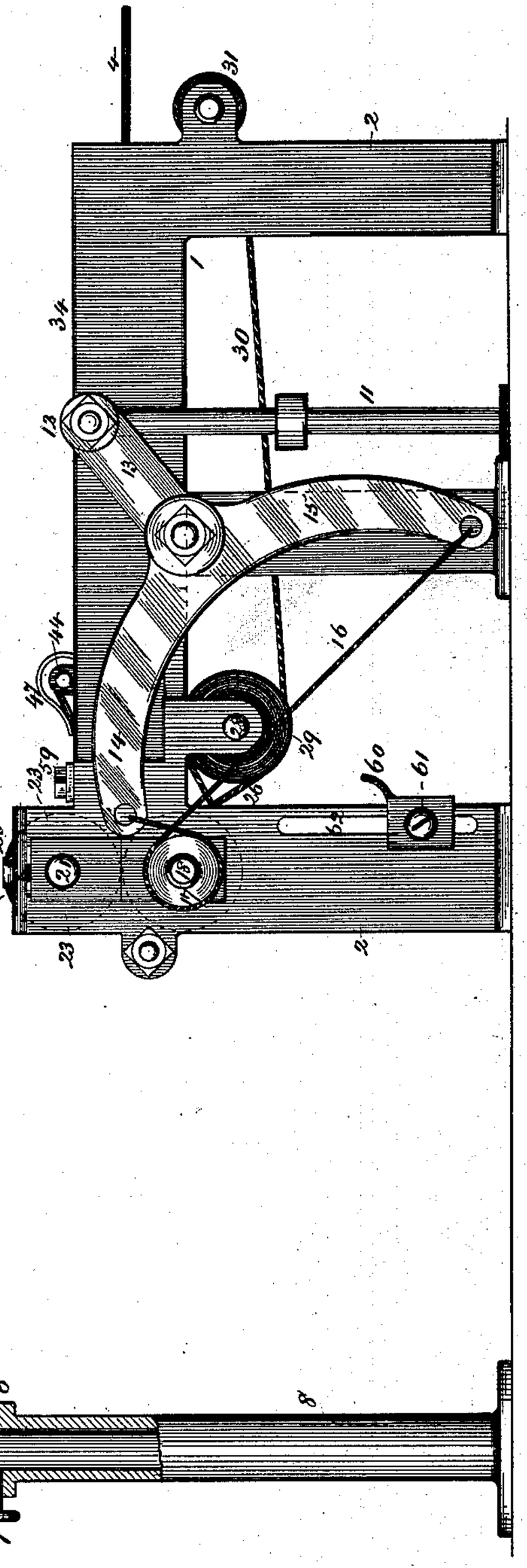

Fig. II.

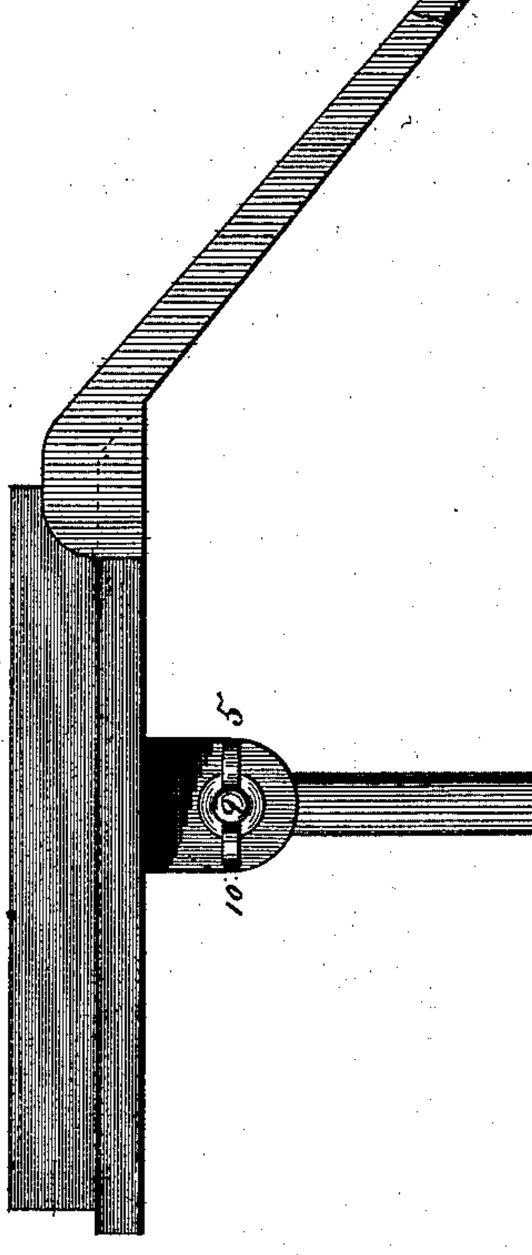

Fig. I.

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(No Model.) 3 Sheets—Sheet 2.

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Fig. III.

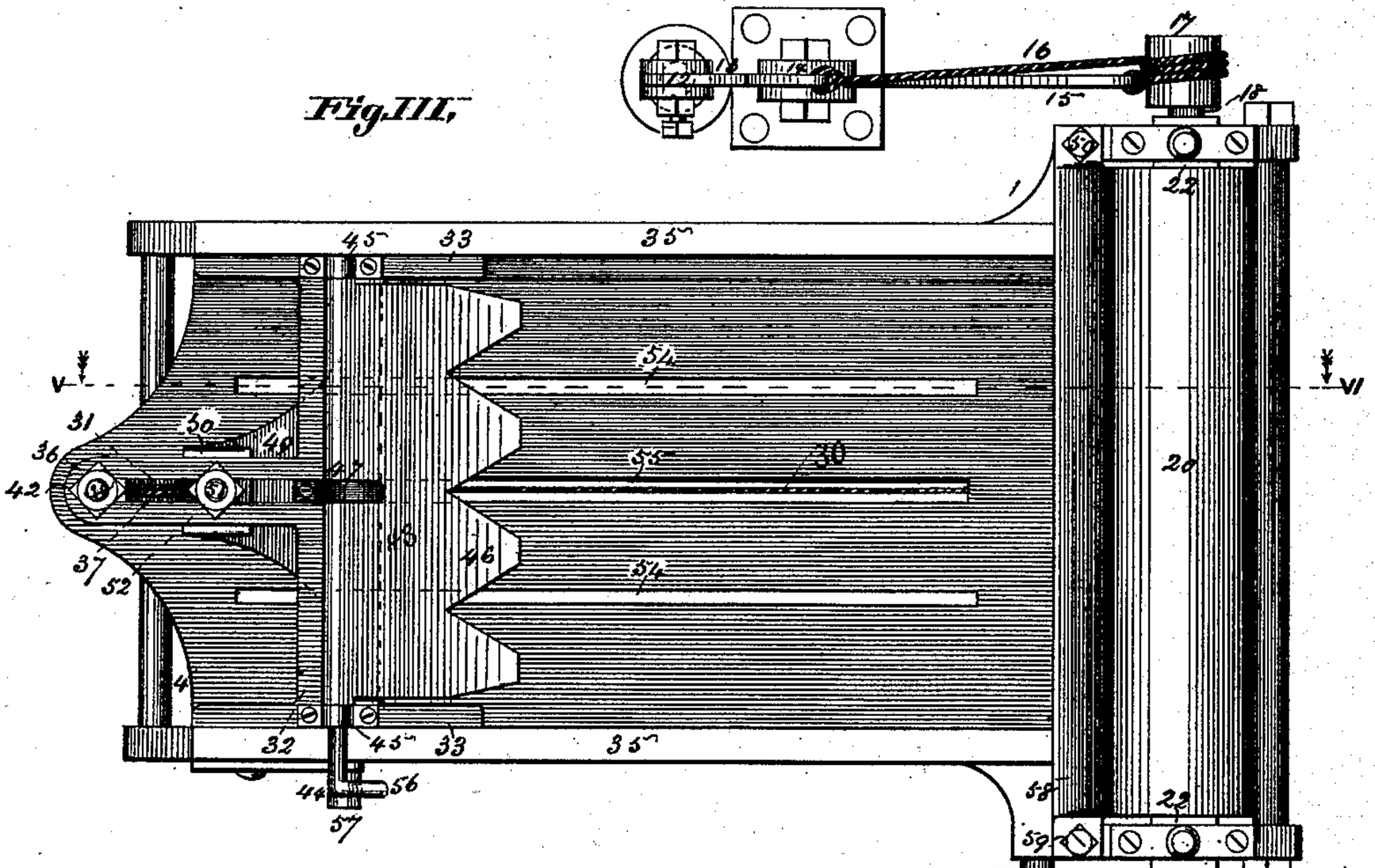
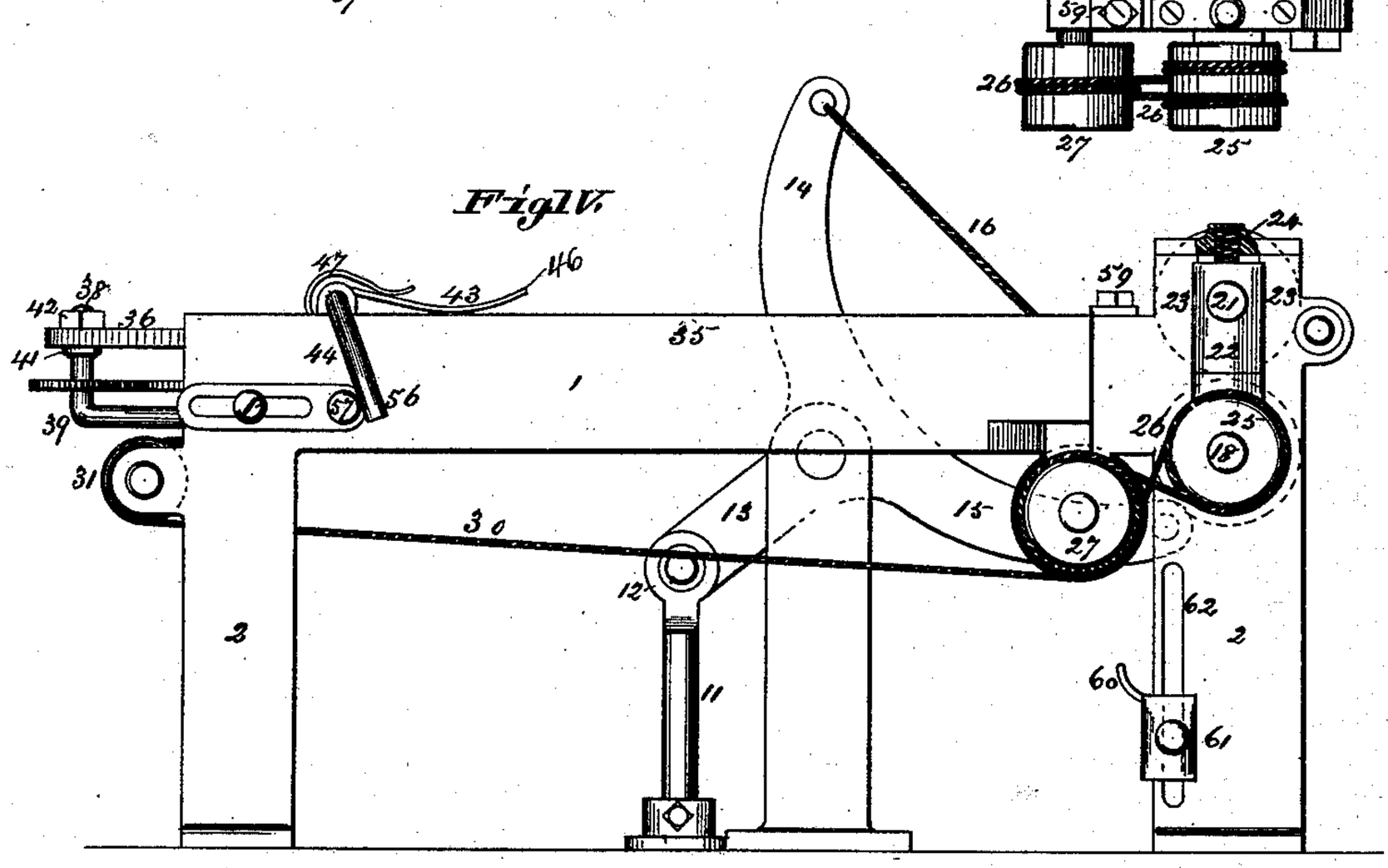


Fig. IV.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. V.

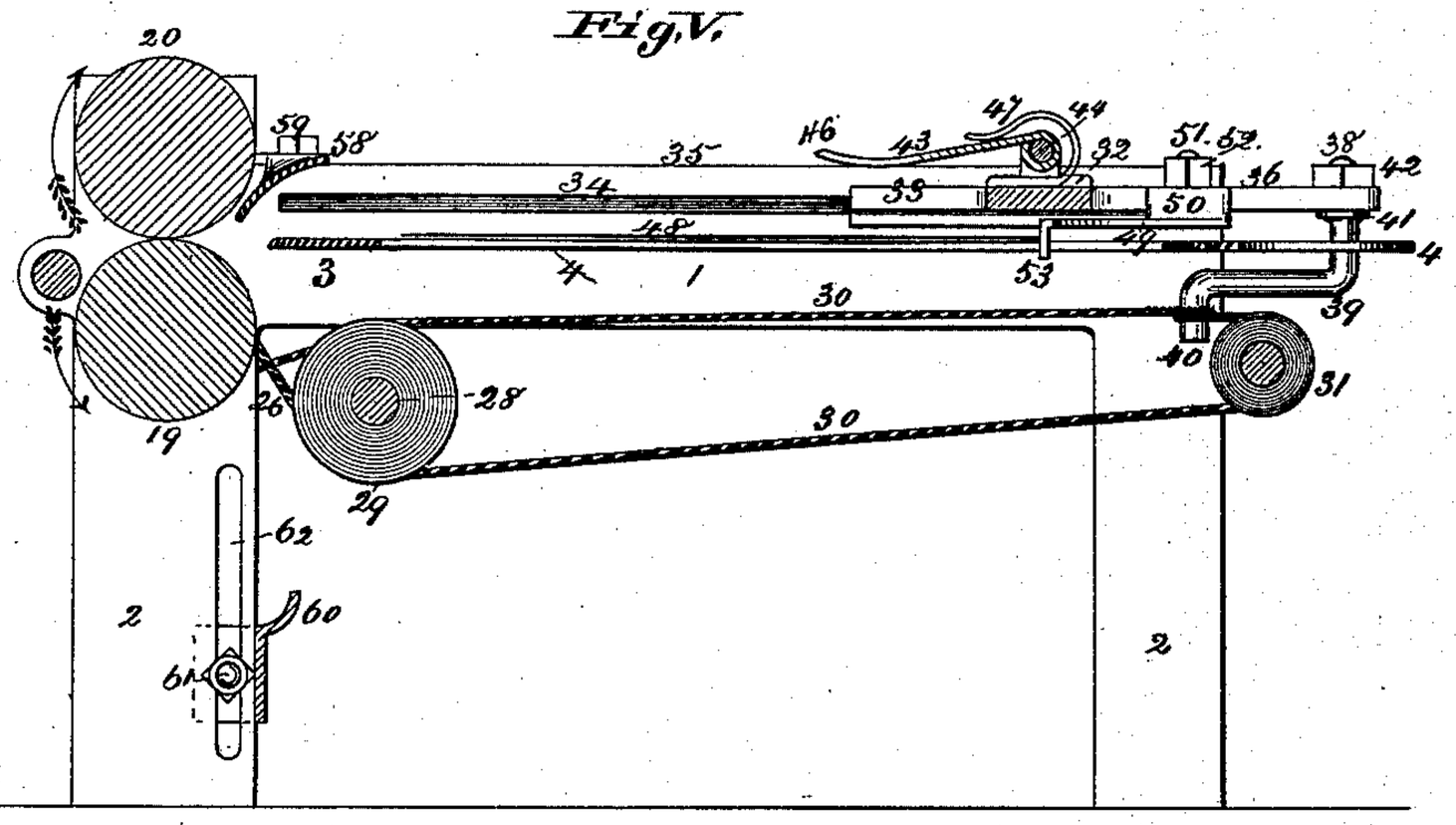


Fig. VI.

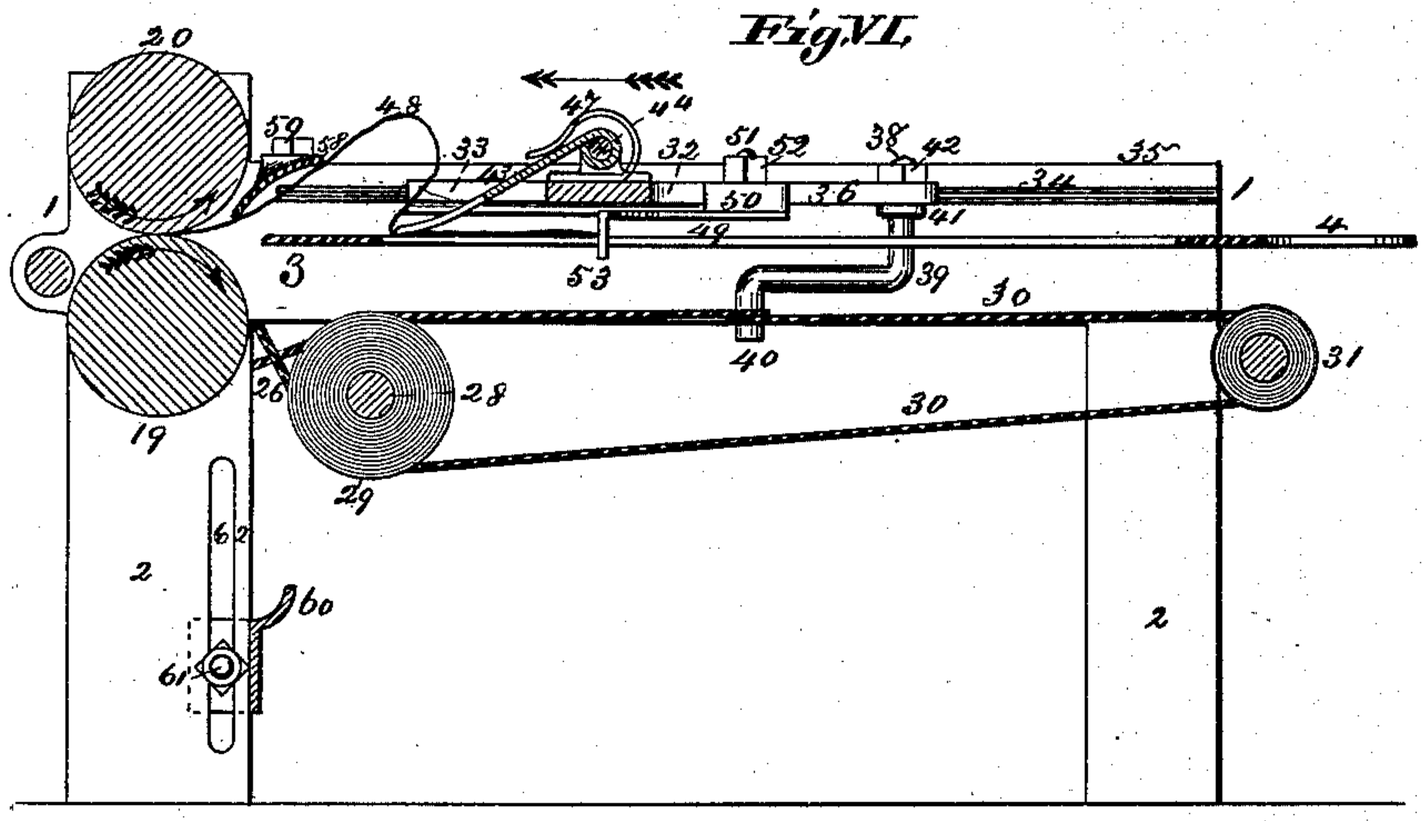
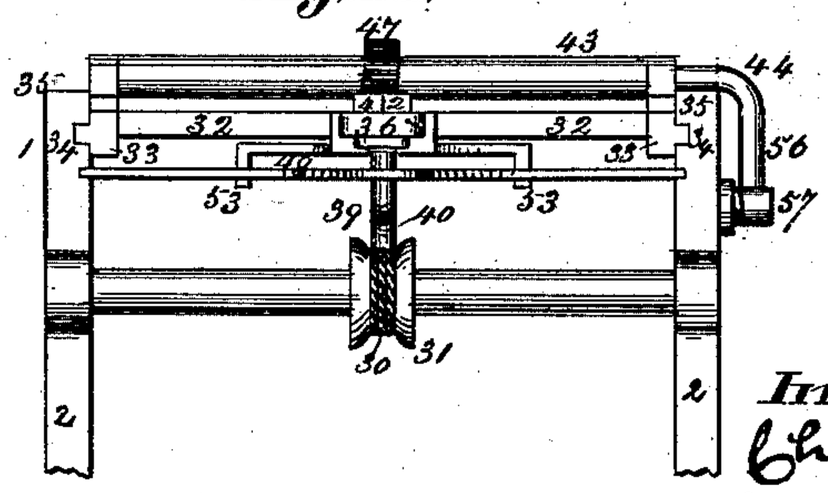


Fig. VII.



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UNITED STATES PATENT OFFICE.

CHARLES F. HINTZE, OF ST. LOUIS, MISSOURI.

FOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 410,098, dated August 27, 1889.

Application filed November 10, 1888. Serial No. 290,434. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. HINTZE, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Folding-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This machine is intended for folding paper and other flexible sheets. It may be used with a printing-press, or separately.

Figure I is a side elevation of the machine. Fig. II is a perspective view of a folded sheet. Fig. III is a top view of the machine with the feed-board removed. Fig. IV is a side elevation of the machine, showing the opposite side to that shown in Fig. I. Fig. V is a longitudinal section at V V, Fig. III, showing the parts in normal position; and Fig. VI is a similar section showing the parts in operation. Fig. VII is a detail end elevation.

1 is a suitable frame having supporting-legs 2.

3 is a table, upon which the sheet to be folded is laid, being fed from the feed-board 4. The feed-board is joined at 5 to a vertically-adjustable standard 6.

7 is a set-screw screwing into the tubular fixed part of the standard and having bearing against the movable rod forming the upper part of the standard.

9 is a screw forming the pivot of the hinge 5, and 10 is a thumb-nut, by which the hinge may be made rigid.

11 is a rod having vertical reciprocation and pivoted at the upper end, at 12, to one arm 13 of a lever having arms 14 and 15.

16 is a cord or belt whose ends are connected to the ends of the arms 14 15, and which is coiled one or more times around a sheave or pulley 17 upon the shaft 18 of a roller 19. Above the roller 19 is a gravitating roller 20, whose gudgeons 21 turn in boxes 22, which have vertical movement between guides 23.

24 are springs adapted to force the boxes 22 downward, so as to press the roller 20 down upon the roller 19, or upon any object between the rollers. The shaft 18 carries a sheave or pulley 25, around which is coiled a cord or belt 26, which is also coiled around a pulley 27 upon a shaft 28, which carries a sheave or pulley 29, around which is coiled a cord or belt 30, which is carried around an idle-sheave 31 at the other end of the machine. The cords or belts 16, 26, and 30 should be coiled a number of times around the pulleys 17, 25, and 29, and the coils should be made fast to the pulleys at one point, so that they cannot slip on the pulleys. As the lever 13 14 15 oscillates, the rollers 19 20 and the shaft 28 have rotary reciprocation.

32 is a slide or cross-head, whose edges 33 work in guide-grooves 34 of the sides 35 of the frame. The slide has a rearward extension or arm 36, slotted longitudinally at 37. Through the slot 37 extends the screw-threaded end 38 of a bent rod 39, whose other end 40 is attached to the cord or belt 30. The rod 39 has on it a collar 41, which bears against the under side of the arm 36, and a nut 42 upon the end 38 bears upon the top of the arm 36, so as to fix the rod rigidly to the arm and cause the slide to move with the cord or belt 30.

43 is a push-plate supported on a rock-shaft 44, turning in bearings 45 on the slide or cross-head 32. The free edge 46 of the plate is arranged to swing downward and upward to and from the table.

47 is a spring, whose purpose is to force the edge and press it upon a sheet 48, which is to be folded.

49 is a feed-plate having jaws 50, that embrace the arm or extension 36.

51 is a bolt or stud set in the plate 49, extending upward through the slot 37, and carrying a nut 52, which bears on the arm or extension 36, and thus fixes the feed-plate rigidly to the slide or cross-head, while at the same time it gives means for the longitudinal adjustment of the plate upon the slide. The plate 49 has pins 53, which extend downward through longitudinal slots 54 in the table. The table has also a central slot 55, in which works the drive-rod 39. The rock-shaft 44 (which carries the plate 43) has a depending arm 56, which, as the slide or cross-head 32 moves backward, comes in contact with an adjustable stop pin or stud 57 and turns the shaft, so as to throw the free edge 43 of the plate upward from the table to leave the way clear for a sheet to be folded.

58 is a fender or guide, by which the ad-

vancing edge of the sheet is guided between the rollers 19 20, and by which the front part of the sheet is held down in a proper position for the folding of the sheet. The fender or guide 58 is made removable, being held in place by two screws 59. It is not used when it is desired to give the paper a single fold, for in such case the fender or guide is removed from the machine and the sheet passed down edgewise between the rollers 19 20 and the front edge of the table 4 until the lower edge of the sheet reaches an adjustable ledge 60, secured to the legs of the machine by bolts 61, that pass through lugs at the ends of the ledge and vertical slots 62, made in the legs.

The operation of the machine is as follows: Where it is desired to make two folds in a sheet, as seen in Fig. II, the plate 43 is adjusted so that its front or free edge is distant from the pins 53 the width of one of the outer leaves of the folded sheet, and the slide or cross-head is so adjusted on the rod 39 that the free edge of the plate 43 will just reach the rollers 19 20 at their point of contact at its most advanced position. The parts, when the sheet is fed upon the table, are in the position seen in Figs. III, IV, and V. The rod 11 now moves upward and the cross-head or slide moves forward, the pins 53 pressing against the rear edge of the sheet 48, and pressing its front edge between the rollers 19 20. These rollers are rotating in the direction indicated by arrows in Fig. VI, so that the edge of the sheet does not pass between them. As the movement of the cross-head carries the arm 56 out of contact with the stop 57, the free end of the plate 43 descends on the sheet 48, and as the cross-head advances a fold is made at the line on which the edge rests, which is carried between the rollers 19 20. When the rod 11 begins to descend, the rotation of the rollers 19 20 is reversed, and they turn in the direction indicated in Fig. V, so as to carry the sheet between them and press the folds, the front edge of the sheet and the fold made by the edge of the plate 43 passing through together and the other fold being made equidistant between the other fold and the front edge of the sheet as the sheet is about to leave the rollers. After a sheet has been once passed through the machine it may be passed through again to cross-fold it.

The manner of giving a single fold to a sheet has been hereinbefore described.

I claim as my invention—

1. The combination, in a folding-machine, of the table 3, the pressure-rollers, as 19 20, and a reciprocating push-plate, as 43, adapted to form an upward bend and a fold in the paper and push such fold between the rollers.

2. The combination, in a folding-machine, of a table adapted to receive the sheet to be folded, the feed-plate, the hinged push-plate 43, having reciprocating longitudinal and oscillating movements, and rollers 19 20, having reciprocating rotary motion, all adapted to operate substantially as set forth.

3. The combination, in a folding-machine, of the table 3, provided with slots 54, the reciprocating cross-head or slide 32, the push-plate 43, hinged to the cross-head, push-pins 53, connected to the cross-head and traversing the slots 54, and rollers 19 20, having rotary reciprocation, all adapted to operate substantially as set forth.

4. The combination, in a folding-machine, of the table 3, provided with slots 54, the reciprocating cross-head 32, plate 49, carrying push-pins 53 and adjustably attached to the cross-head, push-plate 43, hinged to the cross-head, and rollers 19 20, having rotary reciprocation, all adapted to operate substantially as set forth.

5. The combination, in a folding-machine, of the table 3, with slots 54, the cross-head carrying the hinged push-plate 43 and adjustable plate 49, with push-pins 53, traversing the slots 54, slotted extension 36 on the cross-head, and actuating-rod 39, passing through the slot 37 and adjustably secured to the extension 36, and the rollers 19 20, having rotary reciprocation, all substantially as set forth.

6. The combination, in a folding-machine, of the table 3, adapted to receive the sheet to be folded, the cross-head 32, having slotted extension 36, rod 39, passing through the slot 37 of the extension and through a slot 55 in the table and secured to the reciprocating cord or belt 30, and rollers 19 20, having rotary reciprocation, substantially as and for the purpose set forth.

7. The combination of table 3, with slots 54 and 55, the cross-head 32, carrying hinged push-plates 43 and push-pins 53, the rod 39, cord or belt 30, secured to rod 39, sheaves or pulleys 17, 25, 27, 29, and 31, cords or belts 16 and 26, and lever 13 14 15, all connected and arranged to operate substantially as and for the purpose set forth.

8. The combination, in a folding-machine, of the table 3, cross-head 32, having longitudinal reciprocation over said table, hinged push-plate 43, secured to a rock-shaft 44, having bearing on the cross-head, arm 56 on the rock-shaft, and stop 57, secured to the table or frame, and reciprocating rollers 19 20, all adapted to operate substantially as set forth.

9. The combination, in a folding-machine, of the table 3, with slots 54 55, cross-head 32, push-plate 43, plate 49, with push-pins 53, rod 39, adjustably connected to the cross-head, drive-roller 19, pressure-roller 20, shafts 18 and 28, sheaves or pulleys 17, 25, 27, 29, and 31, cords or belts 16, 26, and 30, and actuating-lever 13 14 15, attached to the end of the cord or belt 16 and to an actuating-rod 11, all connected and adapted to operate substantially as set forth.

CHARLES F. HINTZE.

Witnesses:
SAML. KNIGHT,
EDW. S. KNIGHT.