

(No Model.)

3 Sheets—Sheet 1.

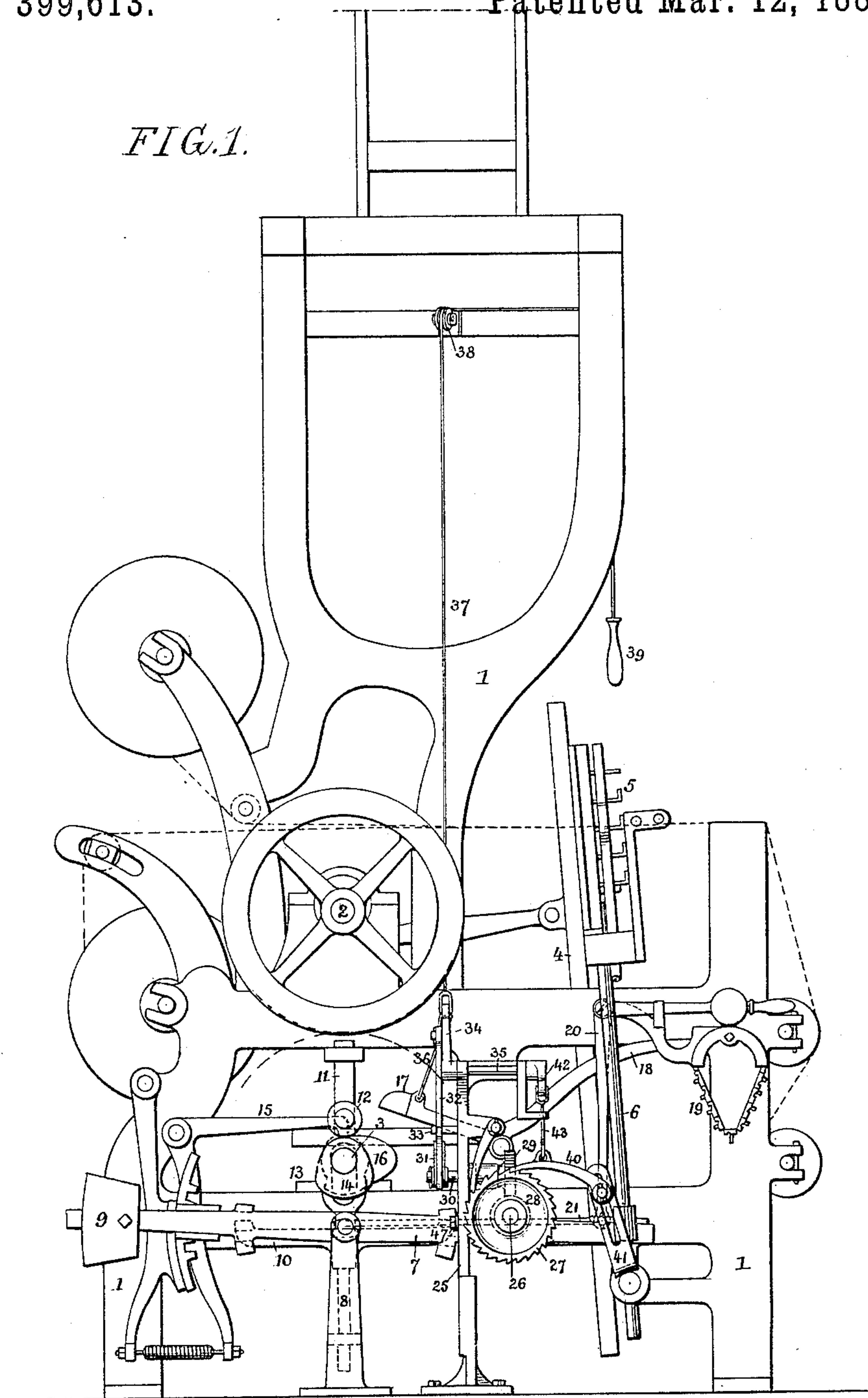
F. HEBDEN.

SHUTTLE BOX PATTERN MECHANISM FOR LOOMS FOR WEAVING
FABRICS HAVING END BORDERS.

No. 399,613.

Patented Mar. 12, 1889.

FIG. 1.



Witnesses:
William D. Garner.
Geo. E. Parker

Inventor:
Frank Hebdon,
by his Attorneys,
Howson & Howson

(No Model.)

3 Sheets—Sheet 2.

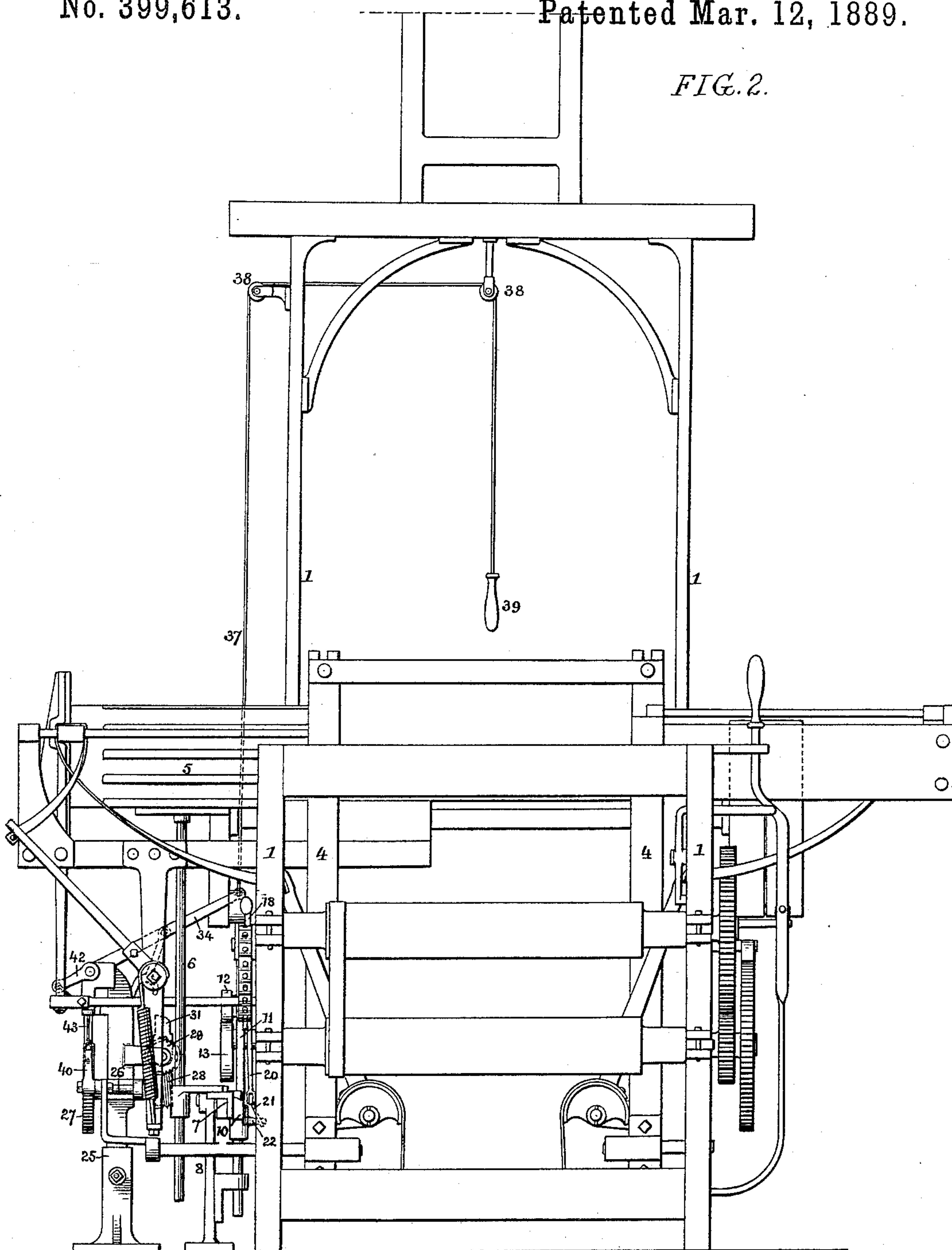
F. HEBDEN.

SHUTTLE BOX PATTERN MECHANISM FOR LOOMS FOR WEAVING
FABRICS HAVING END BORDERS.

No. 399,613.

Patented Mar. 12, 1889.

FIG. 2.



Witnesses:

William D. Bonner

Jno. E. Parker

Inventor:

Frank Hebden

by his Attorneys:

Howson & Howson

(No Model.)

3 Sheets—Sheet 3.

F. HEBDEN.

SHUTTLE BOX PATTERN MECHANISM FOR LOOMS FOR WEAVING
FABRICS HAVING END BORDERS.

No. 399,613.

Patented Mar. 12, 1889.

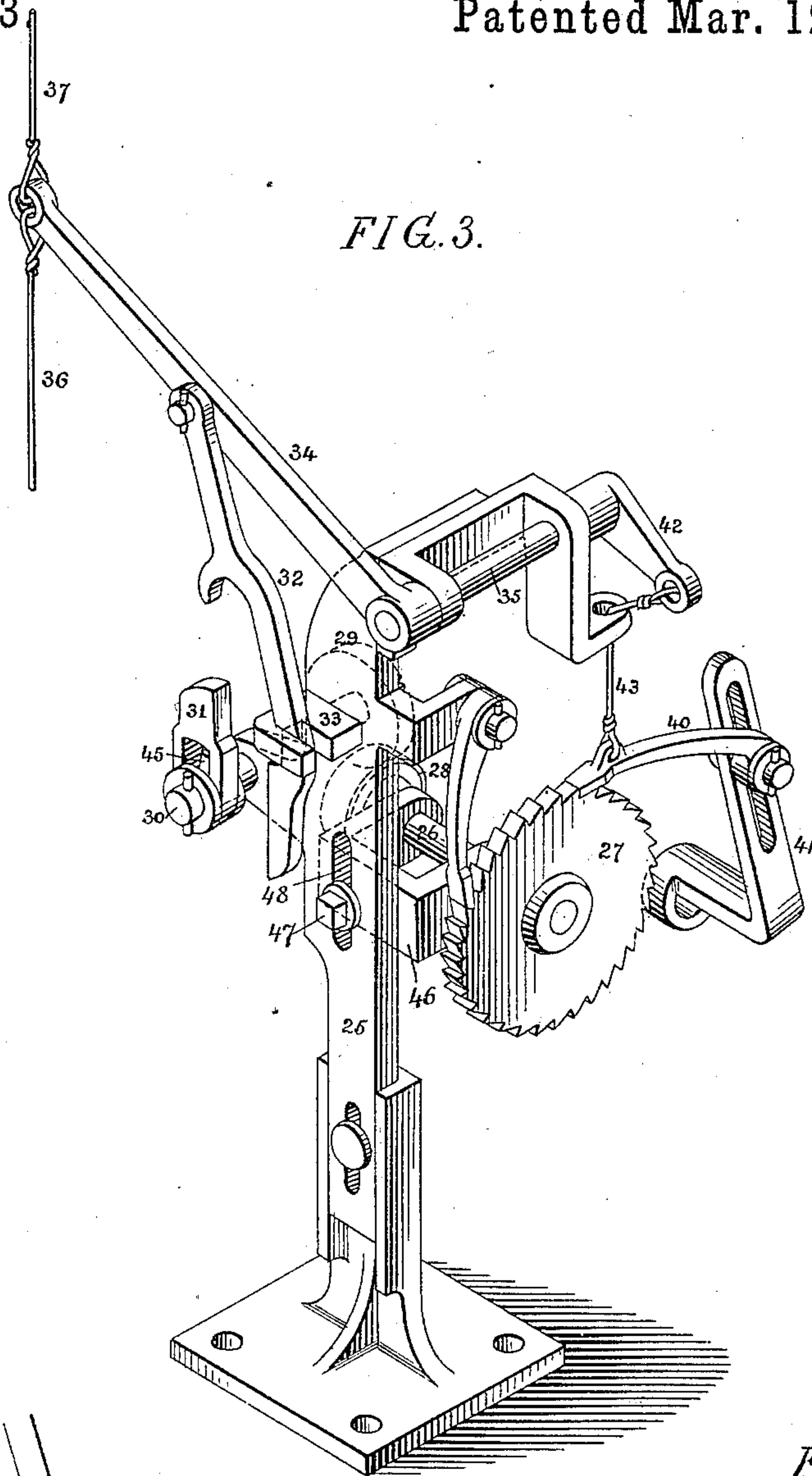


FIG. 3.

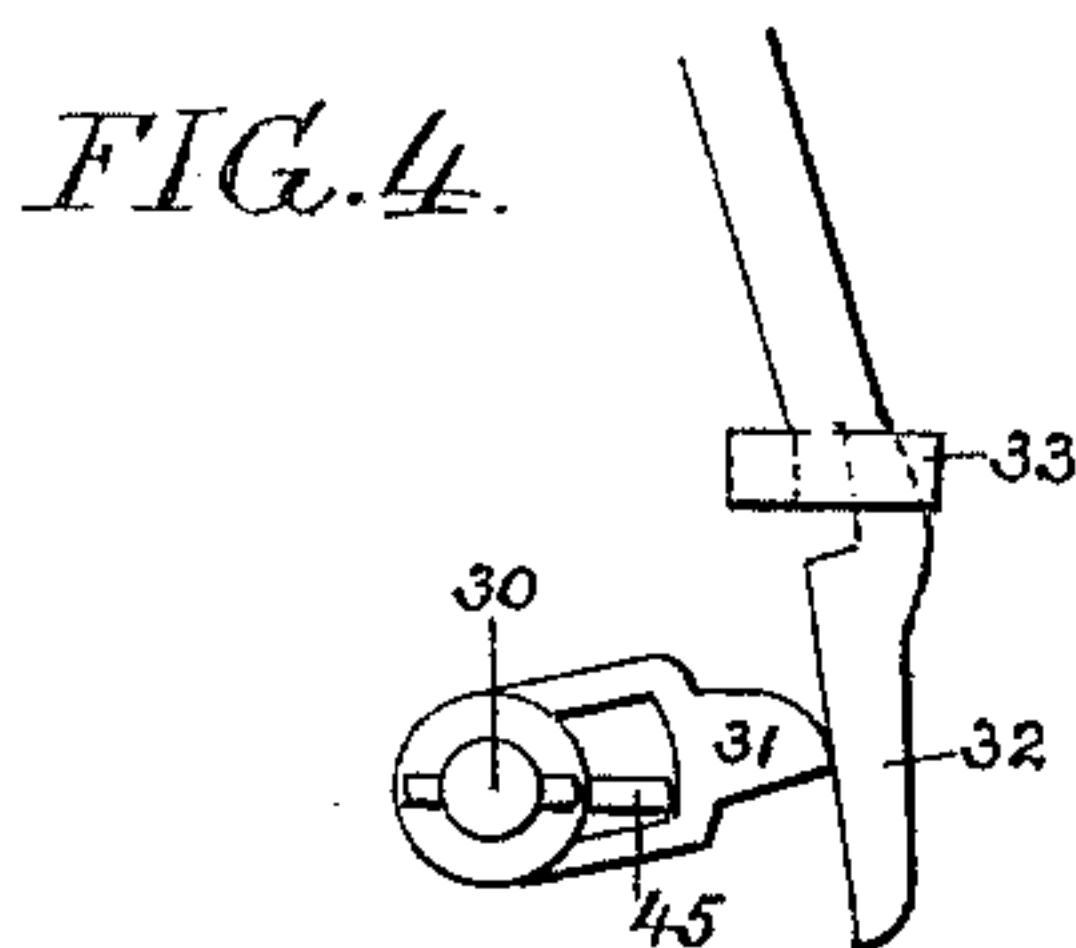


FIG. 4.

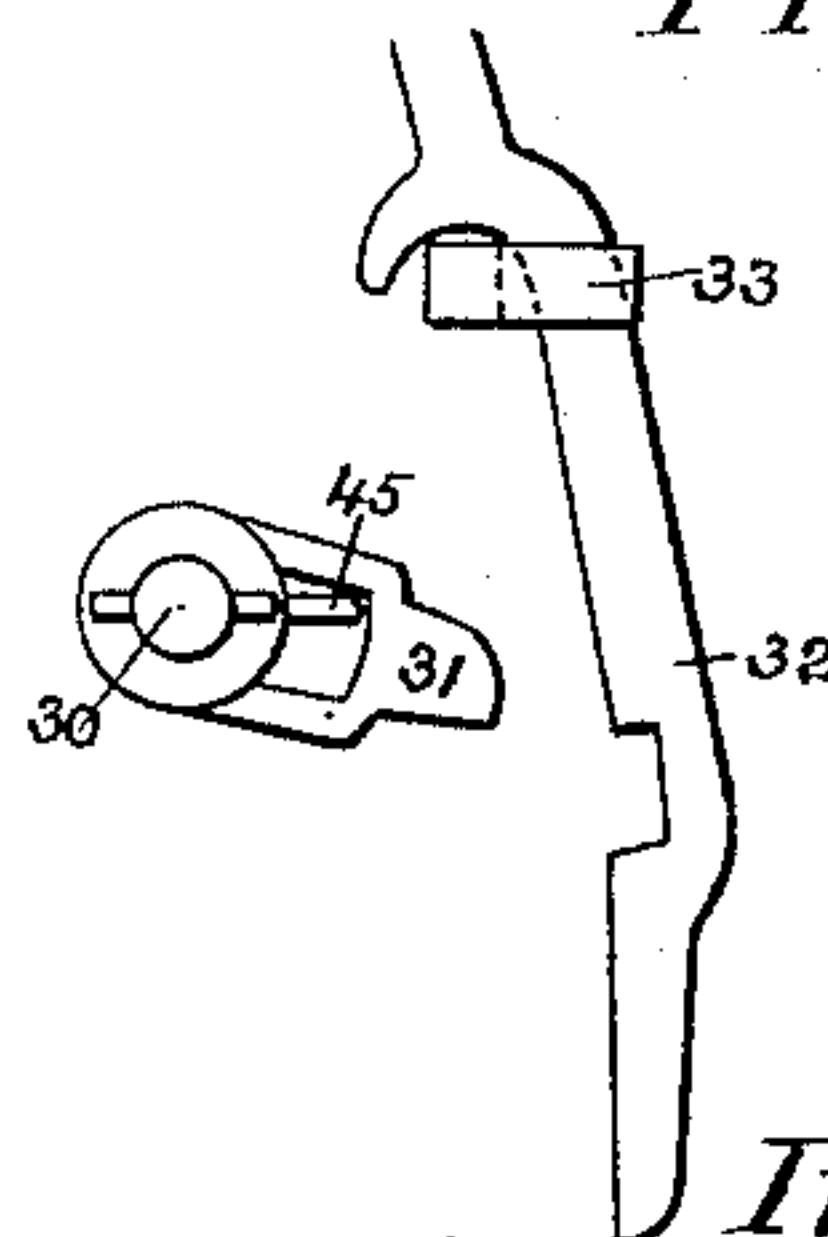


FIG. 5.

Witnesses:
William D. Bonner.
Jno. E. Parker

Inventor:
Frank Hedden
by his Attorneys
Howson & Howson

UNITED STATES PATENT OFFICE.

FRANK HEBDEN, OF PHILADELPHIA, PENNSYLVANIA.

SHUTTLE-BOX PATTERN MECHANISM FOR LOOMS FOR WEAVING FABRICS HAVING END BORDERS.

SPECIFICATION forming part of Letters Patent No. 399,613, dated March 12, 1889.

Application filed January 23, 1888. Serial No. 261,599. (No model.)

To all whom it may concern:

Be it known that I, FRANK HEBDEN, a subject of the Queen of Great Britain and Ireland, residing at Philadelphia, Pennsylvania, have invented certain Improvements in Shuttle-Box Pattern Mechanism for Looms for Weaving Fabrics having End Borders, of which the following is a specification.

My invention relates to looms for weaving fabrics having regularly alternating portions of different character—such, for instance, as the fabrics used for toweling, in which the central portion or body of the towel is plain and has an ornamental border at each end.

The object of my invention is to provide such a loom with an attachment which automatically effects the necessary change in the operation of the loom when the weaving of the body portion has been completed and the border is about to be woven.

In the accompanying drawings, Figure 1 is a side elevation view of part of a loom with my improved attachment. Fig. 2 is a front view of the same. Fig. 3 is an isometric view of the attachment comprising the subject of my invention, and Figs. 4 and 5 are diagrams illustrating the operation of part of the same.

So far as the general construction of the loom is concerned, it may be similar to many of those in common use, the loom shown in the drawings being selected simply for the purpose of illustration; and it should be understood that my invention is not limited especially to this class of looms. In order that my invention may be better understood, however, I will give a short description of the construction and operation of the loom before describing those parts to which my invention particularly relates.

The side frames, 1, of the loom have the usual bearings for the crank-shaft 2 and cam-shaft 3, these two shafts being geared together by spur-wheels, the pitch-lines of which, at the meeting-point, are shown by dotted lines in Fig. 1. The lathe 4 of the loom carries the usual drop-boxes, 5, and to the box-rod 6 is connected one arm of an anchor-lever, 7, hung to a bearing, 8, the other arm of the lever having the counterbalance-weight 9. The lever is operated by the usual anchor, 10, hung to the lower end of the guided anchor-bar 11, which has an anti-friction roller, 12, acted

on by a cam, 13, on the cam-shaft 3, another cam, 14, on said shaft (see dotted lines, Fig. 1) operating the locking-lever 15. There is on the shaft 3 a third cam, 16, which acts upon an arm, 17, pivoted to the bar 18, which operates the drop-box chain 19, the latter acting, through the medium of the lever 20 and rod 21, upon an arm, 22, of the anchor, (see Fig. 2,) so that the latter is caused to swing upon the anchor-bar to determine its proper engagement with the lugs on the inner side of the anchor-lever in the usual manner. In working these looms the arm 17 is held out of engagement with the cam 16 during the weaving of the plain portion of the fabric, the arm being dropped into engagement with the cam when it is desired to throw the drop-boxes into action for weaving the border. Usually the raising and lowering of the arm 17, so as to throw the drop-box mechanism into and out of action, is effected by hand, and close attention on the part of the operator is required in order that the drop-box mechanism may be thrown into action when the proper length of body fabric has been woven; but with the most careful attention on the part of the weaver there is always more or less variation in the length of the body portions. In carrying out my invention, therefore, I provide mechanism for throwing the drop-box motion into action automatically when the proper length of body fabric has been woven, so that accuracy in the operation of the loom is attained and the production of uniform work insured, while the weaver is enabled to attend to a greater number of looms than usual.

The attachment consists of a standard, 25, having bearings for a shaft, 26, which has at one end a ratchet-wheel, 27, and at the opposite end a worm, 28, the latter gearing into a worm-wheel, 29, on a transverse shaft, 30, which has at the end a toe, 31, adapted to act upon a catch-arm, 32, which engages with a lug, 33, on the standard, and is hung to an arm, 34, on a shaft, 35, the outer end of said arm being connected by a cord, 36, to the arm 17 of the box-chain-operating bar, and being also connected by a cord, 37, passing over pulleys 38 to a handle, 39, at the front of the loom. With the ratchet-wheel 27 engages a pawl, 40, the pivot-pin of which is adjustable in a slotted arm, 41, secured to the shaft of

the lathe, so that said arm vibrates with the lathe, and the pawl is therefore caused to impart motion to the ratchet-wheel and to the parts driven thereby. An arm, 42, on the shaft 35 is connected by a cord, 43, to the pawl 40, for a purpose described hereinafter. When the loom is weaving the body of the fabric, the arms 34 and 17 occupy the elevated position shown in Figs. 1 and 3, and are retained in this position by the engagement of the catch-arm 32 with the lug 33; but as the toe 31 is rotated through the medium of the mechanism described, it comes in contact with the lower end of said catch-arm, as shown in Fig. 4, and pushes the same free from engagement with the retaining-lug 33. As soon as the arm is thus freed from engagement with the lug, it falls, as shown in Fig. 5, thus permitting the descent of the arm 34, so as to drop the arm 17 of the box-chain bar into engagement with its operating-cam, while at the same time the pawl 40 is, through the medium of the arm 42 and cord 43, lifted out of engagement with the spur-wheel, thereby stopping the operation of the latter. The parts remain in this position until the border portion of the fabric has been woven, this border portion being of sufficient extent for two towels, one border being upon the end of one towel and the other upon the end of the next towel. When the weaving of the border has been completed, the loom is automatically thrown out of gear in the usual manner by the picking-in of an empty shuttle, so that the weft-stop mechanism acts to release the shipper. In again starting the loom the weaver draws down the handle 39, so as to lift the arm 17 out of range of its cam and throw the registering mechanism into operation. The toe 31 is not confined rigidly to the shaft 30, but has a slot into which projects a pin, 45, on said shaft, the slot being of somewhat greater width than the pin, so that after the toe has knocked off the retaining-arm 32 said toe will drop to a certain extent, as shown in Fig. 5, so as not to be in the way of the re-engagement of the retaining-arm with the lug 33 in resetting the apparatus.

Although I prefer to drive the ratchet-wheel 27 from the shaft of the lathe, as shown and described, I do not desire to limit myself to this method, as it will be evident that the wheel may be driven from some other moving part of the loom, if desired.

I may use worm-wheels 29 of different diameters but like pitch, so that the device can be readily adapted for different lengths of fabric, the bracket carrying the shaft 26 being secured by means of a bolt, 47, adapted to a slot, 48, in the standard, so that said bracket can be raised or lowered to suit the diameter of the worm-wheel used.

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

1. The combination of the drop-box pattern-chain, the operating-cam 16 therefor, the bar

18, having an arm movable into and out of range of the cam, a retainer for holding said arm out of action, a tripper for said retainer, and mechanism for actuating said tripper, all substantially as specified.

2. The combination of the drop-box pattern-chain, the operating-cam 16 therefor, the bar 18, having an arm movable into and out of range of the cam, a retainer for holding said arm out of action, and a tripping device for said retainer, comprising a shaft having a tripping-toe and worm-wheel, another shaft having a worm and ratchet wheel, and means for operating said ratchet-wheel, all substantially as specified.

3. The combination of the drop-box pattern-chain, the operating-cam 16 therefor, the bar 18, having an arm movable into and out of range of the cam, a retainer for holding said arm out of action, a tripping-toe for said retainer, operating-gearing for said toe having a ratchet-wheel, a pawl for operating said ratchet-wheel, means for actuating the pawl, and a connection between said pawl and the retainer, whereby the pawl is thrown out of action on the release of the retainer, all substantially as specified.

4. The combination of the drop-box pattern-chain, the operating-cam 16 therefor, a bar, 18, having an arm movable into and out of range of the cam, a retainer for holding said arm out of action, a tripping-toe for said retainer, the pawl and ratchet and intervening gearing for operating said toe, and a rock-shaft having two arms, one connected to the pawl and the other to the retainer and to the movable arm of the bar 18, all substantially as specified.

5. The combination of the drop-box pattern-chain, the operating-cam 16 therefor, the bar 18, having an arm movable into and out of range of the cam, a retainer for holding said arm out of action, a tripping-toe, an operating-shaft therefor having a driving-pin adapted to a slot of greater width than the pin, and means for driving said shaft, all substantially as specified.

6. The combination of the drop-box pattern-chain, the operating-cam 16 therefor, the bar 18, having an arm movable into and out of range of the cam, a retainer for holding said arm out of action, a tripping-toe, an operating-shaft therefor having a worm-wheel, a driving-shaft having a worm and ratchet wheel, means for operating said ratchet-wheel, a bracket carrying said driving-shaft, and means for adjusting said bracket, whereby worm-wheels of different diameters may be used, all substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK HEBDEN.

Witnesses:

WILLIAM D. CONNER,
HARRY SMITH.