(No Model.)

4 Sheets—Sheet 1.

W. S. HAMM.

STAPLING MACHINE.

No. 521,369. Patented June 12, 1894.

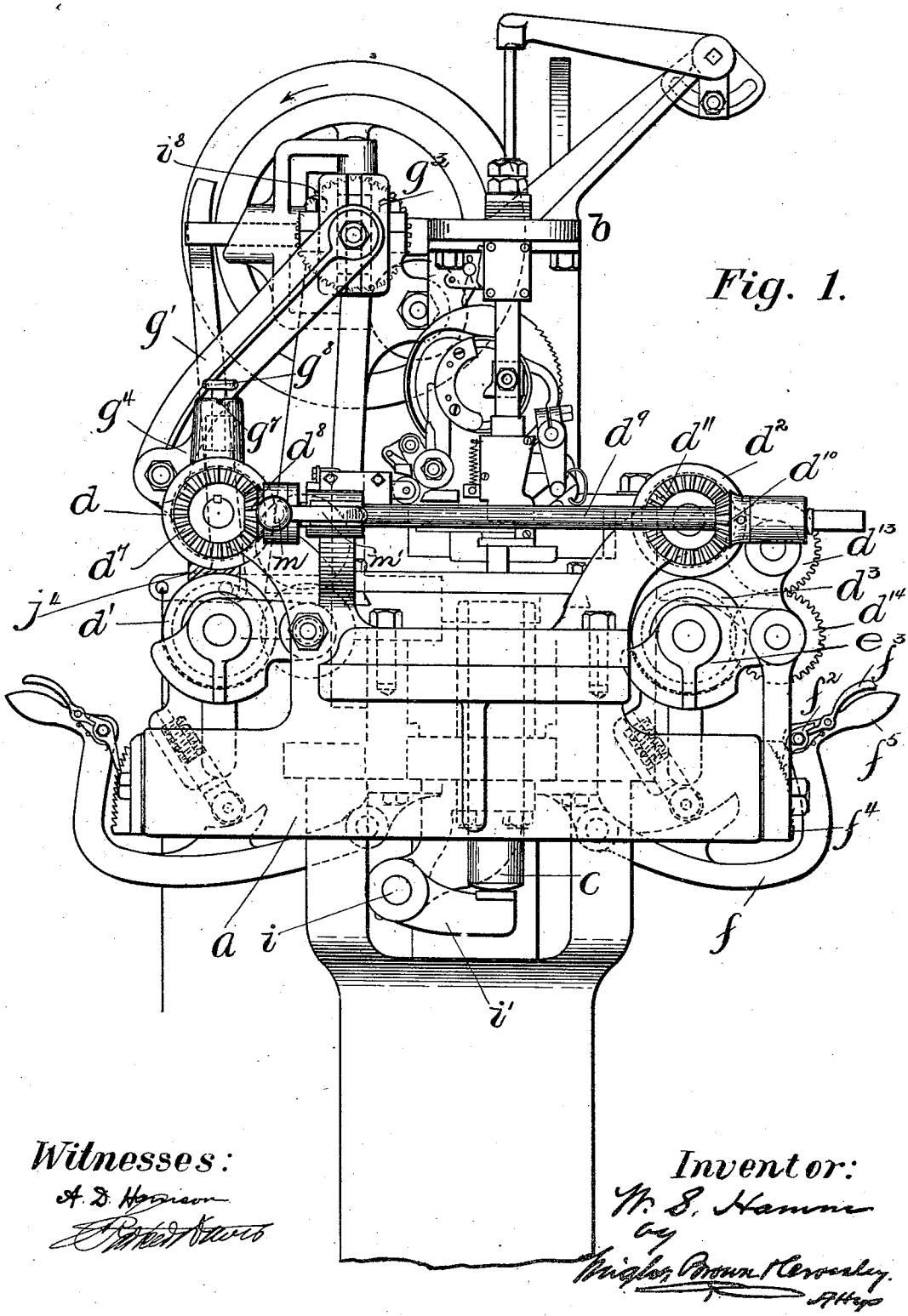

Fig. 1.

Witnesses:
A. D. Harrison
Robert Harris

Inventor:
W. S. Hamm
by
Wright, Brown, Quinby & Hoyt

THE NATIONAL LITHOGRAPHING COMPANY,
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(No Model.) 4 Sheets—Sheet 2.

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STAPLING MACHINE.

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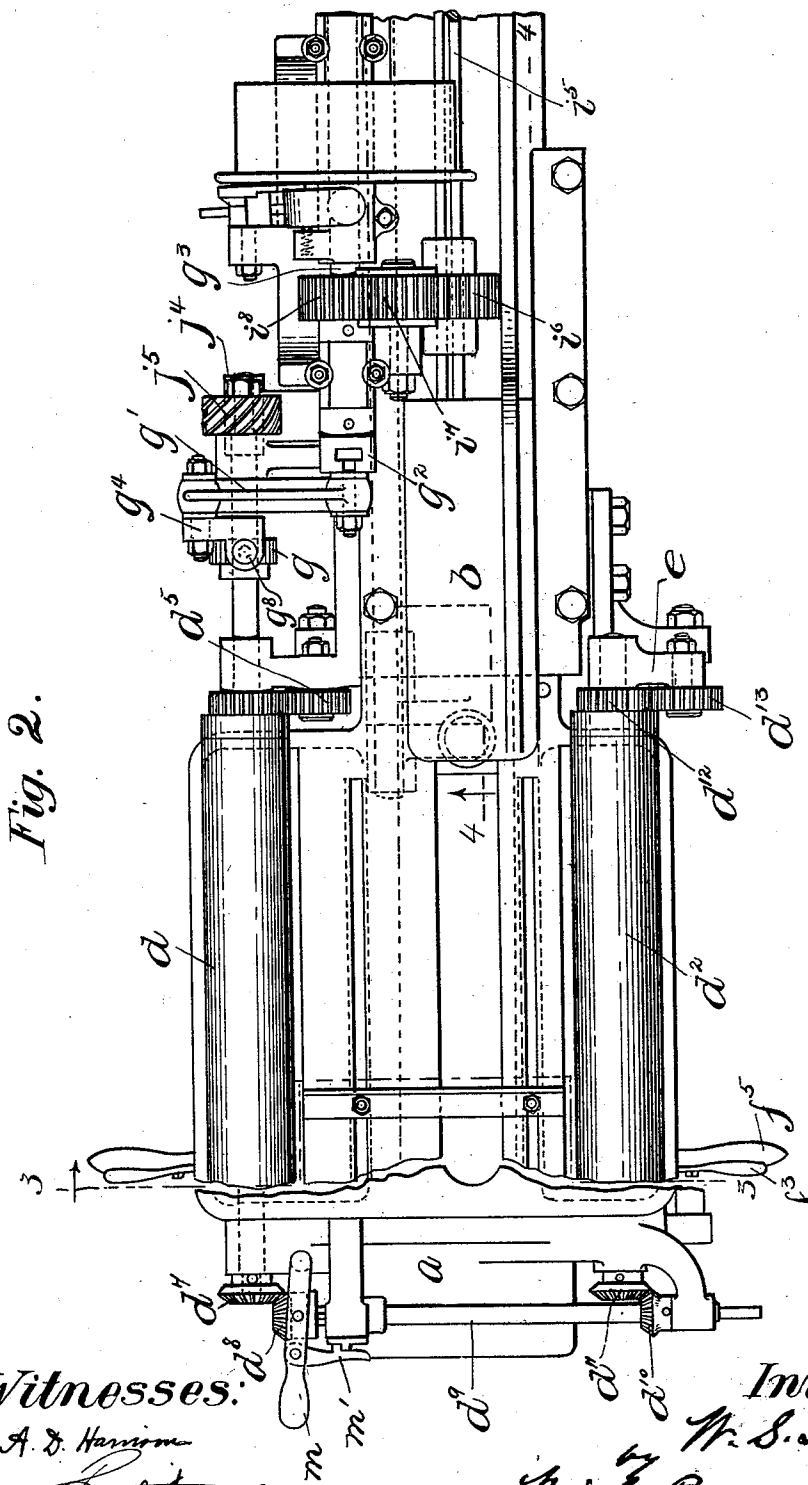

Fig. 2.

Witnesses:
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Parker Davis

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(No Model.)

4 Sheets—Sheet 3.

W. S. HAMM.

STAPLING MACHINE.

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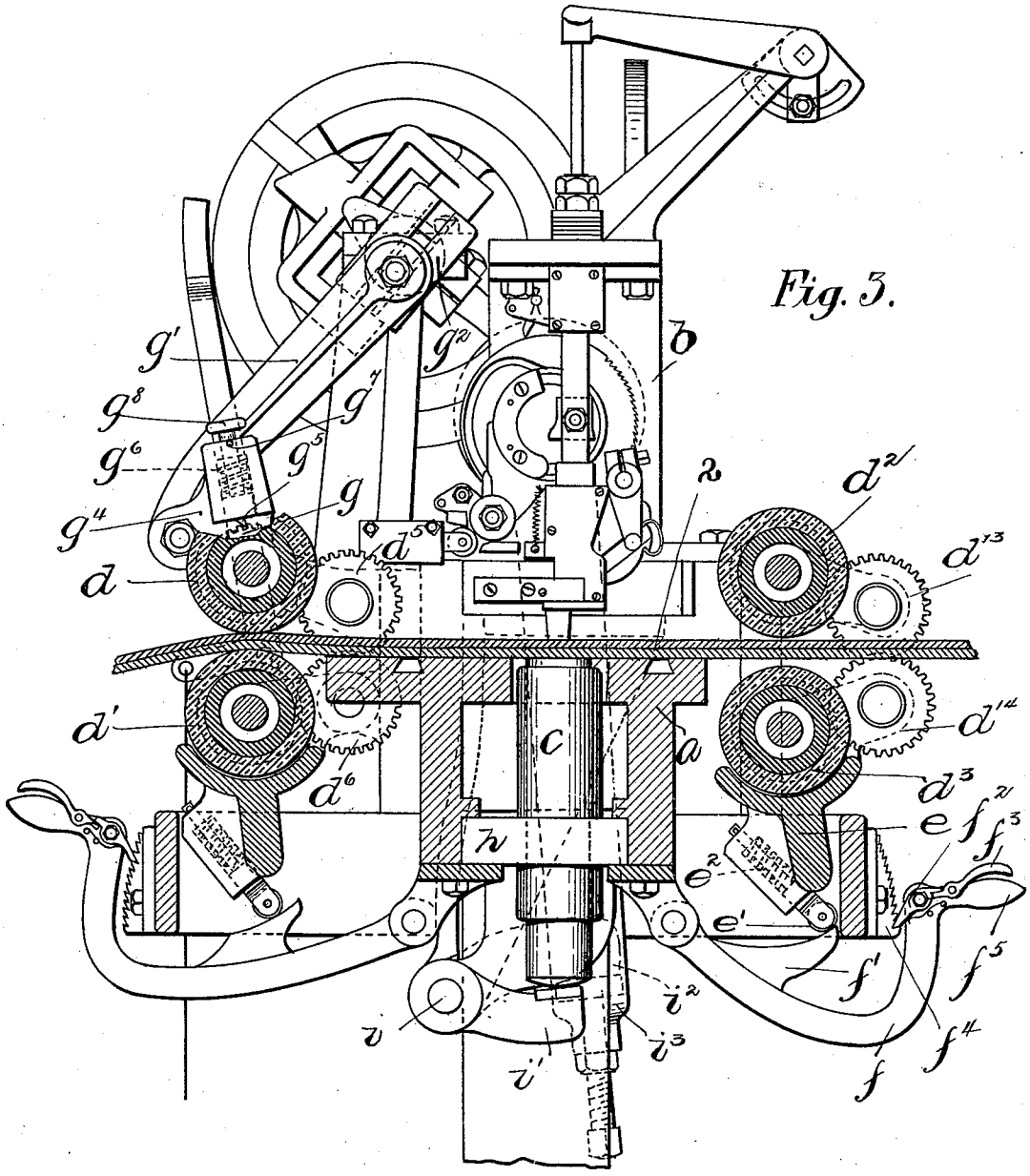

Fig. 3.

Witnesses:
A. D. Harrison
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(No Model.) 4 Sheets—Sheet 4.

W. S. HAMM.

STAPLING MACHINE.

No. 521,369. Patented June 12, 1894.

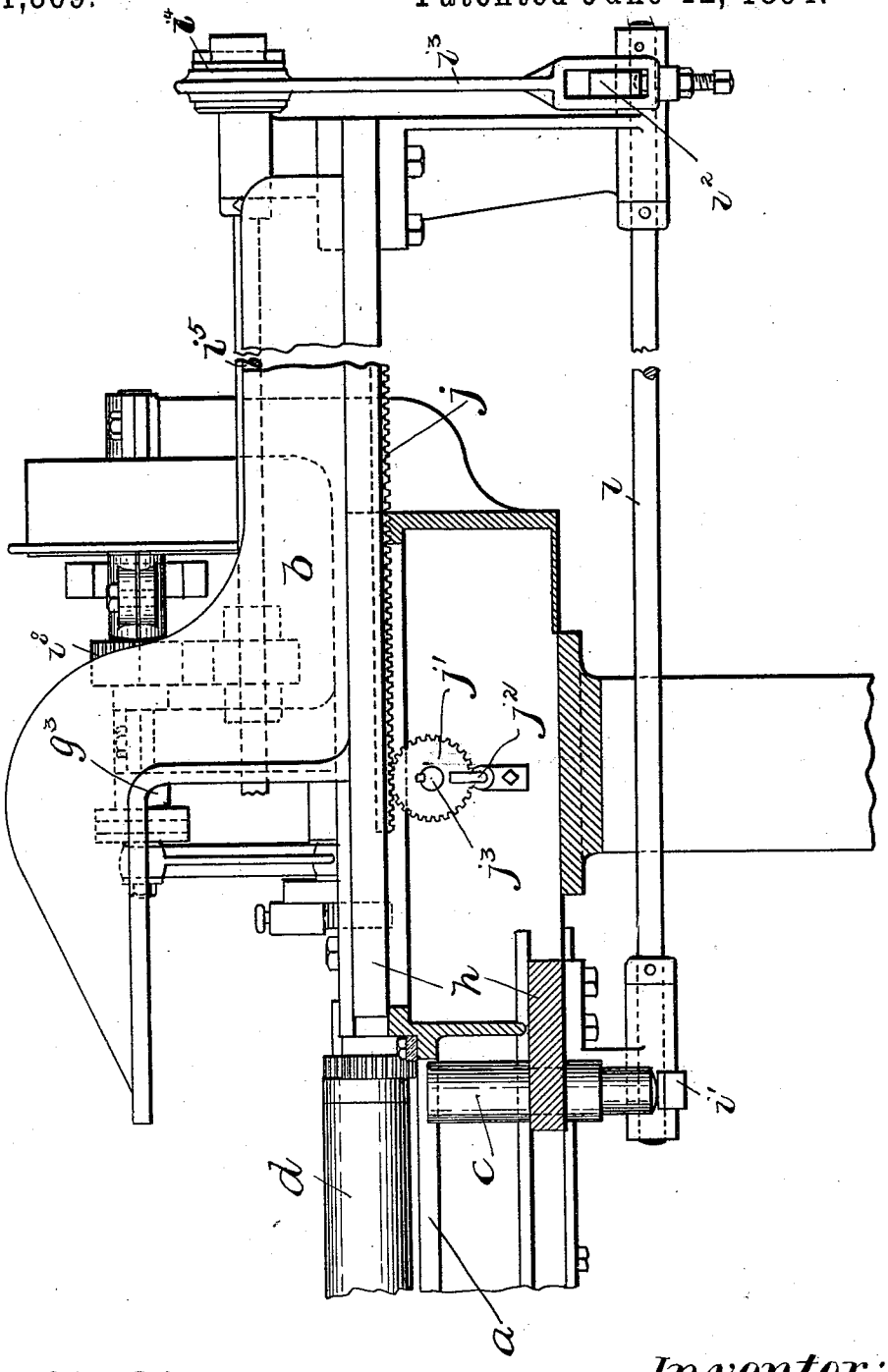

Fig. 4.

Witnesses:
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[illegible]

Inventor:
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UNITED STATES PATENT OFFICE.

WILLIAM S. HAMM, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO THE STAPLE FASTENING MACHINE COMPANY, OF SACO, MAINE.

STAPLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 521,369, dated June 12, 1894.

Application filed October 9, 1893. Serial No. 487,618. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. HAMM, of Newton Centre, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Stapling-Machines, of which the following is a specification.

This invention relates to certain improvements in stapling machines of the character shown in my former patent, No. 447,681, granted March 3, 1891, the object of the present improvement being to specially adapt the machine for the manufacture of belting.

To this end the invention consists in a novel arrangement of feed mechanism whereby a longitudinal row of staples may be inserted, and also a transverse row of staples, all of which will be fully described hereinafter.

Referring to the accompanying drawings which illustrate a construction for carrying out the invention, Figure 1 shows a front elevation of a machine, which embodies the invention. Fig. 2 shows a top plan view. Fig. 3 shows a longitudinal section. Fig. 4 shows a section on line 4—4 of Fig. 2.

The letter *a* designates the supporting bed of the machine, and *b* a head which supports staple-forming and inserting means, the details of which are not here described as they form no part of the present invention, and moreover are shown and described in my former patent hereinbefore mentioned; and *c* an anvil which co-acts with the staple forming and inserting means. The belting 2, whose laminæ are to be fastened together by the staples, passes over the bed *a* and is fed through the machine by the following means:

A pair of feed rolls d d', d^2 d^3 are located at each side of the machine, and each of said rolls are preferably formed of a round bar of iron, cored out, and faced with rubber. The upper roller of each set is supported in stationary bearings, while each lower roll is adjustably supported as follows: A hinged frame *e* forms a bearing for the roll, and carries at the central part an anti-friction roller e' adapted to yield and being backed up by a spring e^2. A pivoted arm f has an inclined projection f' on which said roller e' bears, and said arm carries a pawl f^2 pivoted and spring-actuated, and adapted to be operated by a handle f^3 pivoted to the arm f. Said pawl engages a stationary rack f^4, and by raising or lowering the said arm,—which has a handle f^5,—the pawl may be engaged with different portions of the rack and the lower feed-roll adjusted with respect to the upper one. One of the upper rollers which is designated d carries a ratchet g, and an arm g^4 pivoted on the journal of the roller carries a pawl g^5 engaging said ratchet. A pitman g' connects a crank-disk g^2 in the driving shaft g^3 with the pivoted arm g^4 and through this means the pawl is reciprocated and the roll turned step-by-step. The pawl g^5 is reversible and may move the roll in either direction; it is fitted to slide longitudinally in a way formed in the arm g^4, and is actuated by a spring g^6 into engagement with the ratchet, its end being beveled on one side. Notches are formed in the arm g^4 and a pin g^7, fixed transversely in the pawl, engages said notches, and the pawl is thereby prevented from turning. A knob g^8 in the end of the pawl affords means whereby the latter may be withdrawn sufficiently to release its pin from the notches, and then turned around and the pin again engaged with said notches. Under one adjustment of the pawl it will be seen that the roll will be moved in one direction, while under the other adjustment of said pawl the roll is turned in the opposite direction, for under the first-named adjustment one stroke of the pitman drives the roll, and the other stroke of said pitman simply slides the pawl over a tooth of the ratchet, whereas under the other adjustment the reverse is true. The roll d carries a gear and is connected through intermediate gears d^5, d^6, with a gear on the roll d', and through bevel gears d^7, d^8, shaft d^9 and bevel gears d^{10}, d^{11} with the roll d^2, and the latter carries a gear d^{12}, and is connected through intermediate gears d^{13}, d^{14}, with a gear on the roll d^3. Through these connections all the feed-rolls are operated simultaneously.

The operation of the mechanism thus far described is as follows: One set of the feed-rolls, as d and d', see Fig. 3, is thrown into operative relation and acts to draw the belting 2 through the machine step-by-step, the

staples being inserted while the pawl g slips over the teeth of the ratchet. At this time the roll d^3 is lowered out of operative position. When the longitudinal line of staples has been inserted the pawl g is reversed, the roll d' is lowered out of operative position, and the roll d^3 is brought up against the work. The belting is now drawn back through the machine and another longitudinal line of staples inserted. This saves running the work twice through the machine in the same direction. After the first longitudinal line of staples has been inserted, the staple-inserting means are shifted to position for inserting a new longitudinal line of staples through means hereinafter described. Through these means transverse rows of staples may be inserted at intervals, and these means will now be described.

The head b is mounted on a carriage h which fits slide-ways in the bed a and the anvil c is also mounted on this carriage. The means for reciprocating the anvil are as follows: A rock-shaft i is supported in bearings on the carriage h, and the anvil rests on an arm i' affixed to said rock-shaft. Another arm i^2 affixed to said rock-shaft is connected by a rod i^3 with an eccentric i^4 on a counter-shaft i^5 to which a gear i^6 is splined and said gear is connected through an intermediate gear i^7 with a gear i^8 on the driving-shaft g^3. A rack j is fastened to the carriage h and a gear j' meshes therewith, said gear adapted to be shifted into and out of mesh with said rack by a shipper j^2, and being splined on a shaft j^3, which is connected through skew-gears j^4, j^5 with the journal of the roll d. The bevel-gear d^8 (see Fig. 2) is splined to the shaft d^9, and may be thrown out of mesh with the bevel-gear d^7 by means of a shipping-lever m, which is held in its two positions by the engagement of a latch m' with a stationary projection on the machine frame. When a transverse line of staples is to be inserted the bevel-gear d^8 is disconnected from the gear d^7. The roll d' is lowered out of operative position, and the roll d^3 is brought up against the belting and clamps it against the roll d^2, and the belting is held stationary for these rolls d^2 and d^3 no longer revolve. The gear j' is thrown into mesh with the rack j, and is moved step-by-step through its connections with the roll d.

The invention may be embodied in different form than here shown, and is not, therefore, limited in this respect.

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

1. A machine of the character described comprising in its construction two sets of feed-rollers at opposite sides of the machine, one roller of each set being adjustably supported, gearing connecting all the said feed-rollers, and means for actuating the same step-by-step, said means being capable of adjustment so as to actuate the rollers in either direction.

2. A machine of the above described character comprising in its construction two sets of feed-rollers at opposite sides of the machine, one roller of each set being adjustably supported, and one roller carrying a ratchet, a pitman connected with the driving-shaft and carrying a reversible pawl for engaging said ratchet, and means operatively connecting the two sets of feed rollers.

3. In a machine of the character described, a longitudinal feed, a transverse feed, an intermittent driver, means for operatively connecting the same with the longitudinal and the transverse feed, to produce step-by-step action thereof, and means for rendering both feeds inoperative, substantially as and for the purpose described.

4. In a machine of the character described, a longitudinal feed, an intermittent driver connected therewith, means for rendering said longitudinal feed inoperative, a transverse feed, and means for connecting said driver with and disconnecting it from the said transverse feed.

5. In a machine of the character described, the combination of means for feeding the work longitudinally, an intermittent driver connected therewith, means for rendering said work-feeding means inoperative, a tool-supporting carriage movable transversely of the work, and means for connecting said driver with and disconnecting it from said carriage.

6. In a machine of the character described, the combination of means for feeding the work longitudinally, an intermittent driver connected therewith, means for rendering said work-feeding means inoperative, a tool-supporting carriage movable transversely of the work, an anvil mounted on said carriage, and means for connecting the driver with and disconnecting it from the carriage.

7. In a machine of the character described, the combination of feed-rollers for moving the work longitudinally, an intermittent driver adapted to actuate the same, a tool-supporting carriage movable transversely of the work, and means for connecting the same with and disconnecting it from the intermittent driver.

8. In a machine of the character described, the combination of two sets of feed-rollers, one roller of each set being movable out of operative relation with the other, means for operatively connecting the sets of rollers and for disconnecting them, an intermittent driver for actuating the rolls, a tool-supporting carriage movable transversely of the work, and means for connecting the same with and disconnecting it from the intermittent driver.

9. In a machine of the character described, the combination of two sets of feed-rollers, one roller of each set being movable into and out of operative relation with the other, gearing connecting the sets of rollers and including a clutch, a ratchet on one of the rollers, a pitman connected with the driving shaft

and carrying a pawl engaging said ratchet, a tool-supporting carriage movable transversely of the work and having a rack, a gear movable into and out of engagement with said rack, and connections between said gear and the roller carrying the ratchet.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 6th day of October, A. D. 1893.

WILLIAM S. HAMM.

Witnesses:
C. F. BROWN,
A. D. HARRISON.