

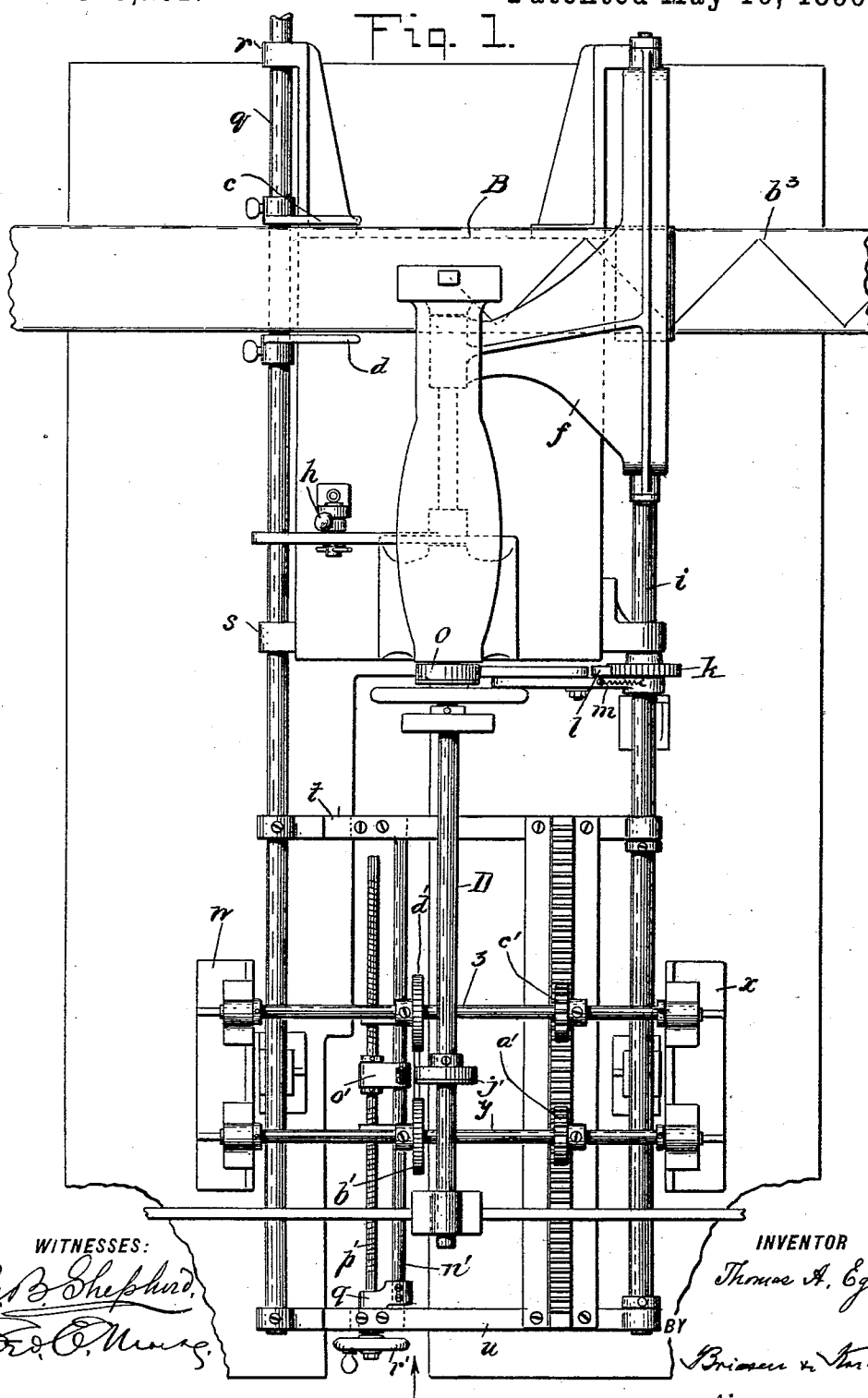
(No Model.)

3 Sheets—Sheet 1.

T. A. EGAN.
BELT STITCHING MACHINE.

No. 560,201.

Patented May 19, 1896.



WITNESSES:

P. B. Shepard.
 F. O. Mearns.

INVENTOR

Thomas A. Egan,

Briggs & Thorneth
his ATTORNEYS

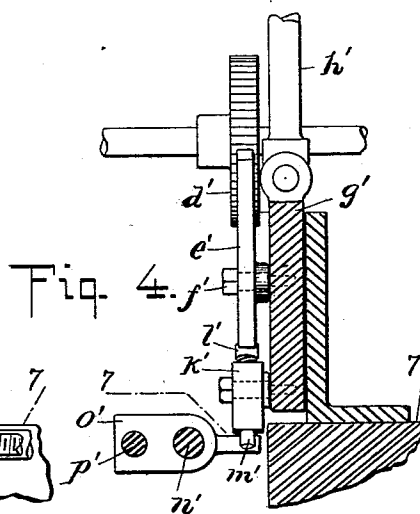
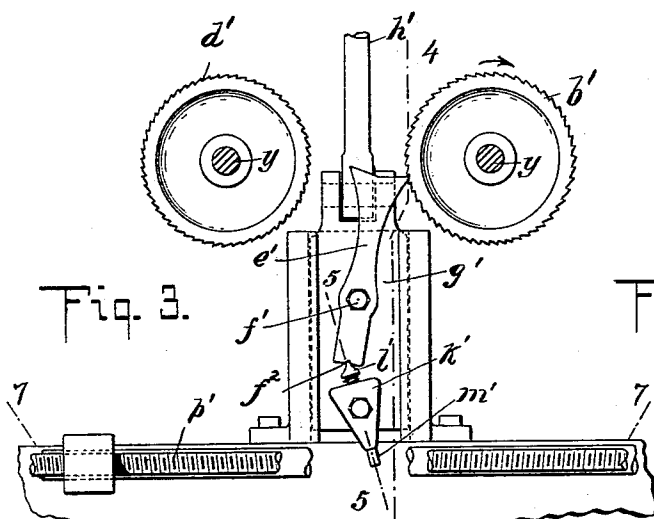
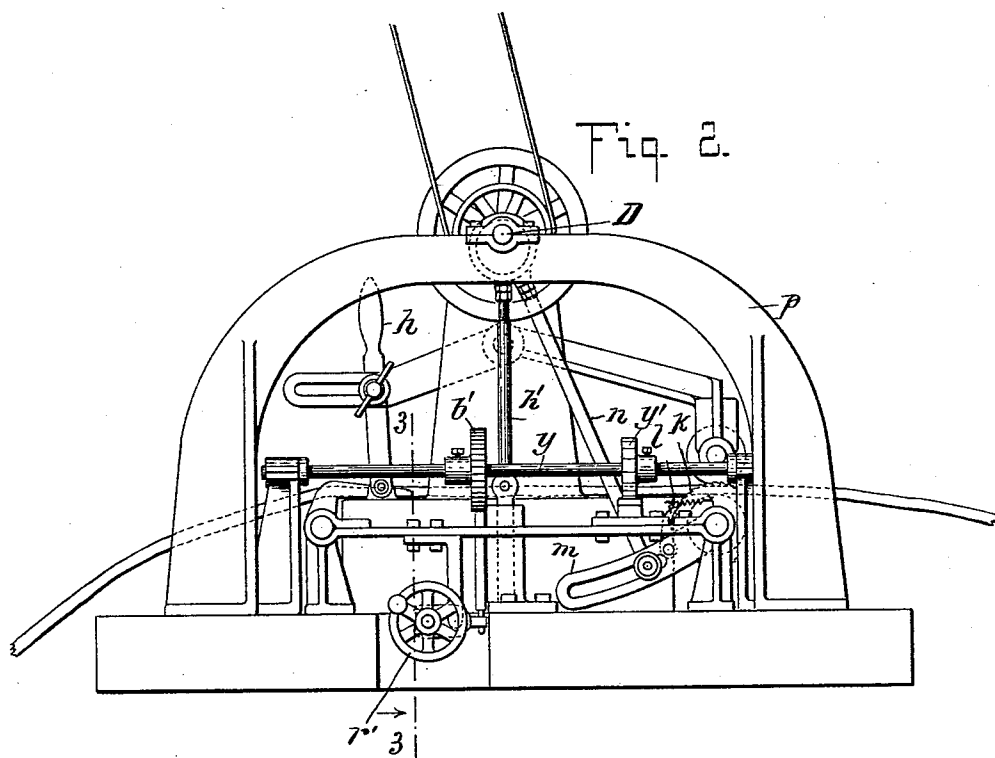
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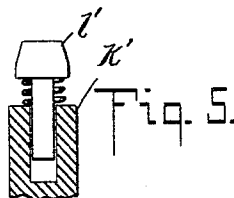
T. A. EGAN.
BELT STITCHING MACHINE.

No. 560,201

Patented May 19, 1896.



WITNESSES:
Ph. B. Shepherd.
Ed. C. Morse.



INVENTOR
Thomas A. Egan.
BY
Brisson & Marzetti
his ATTORNEYS

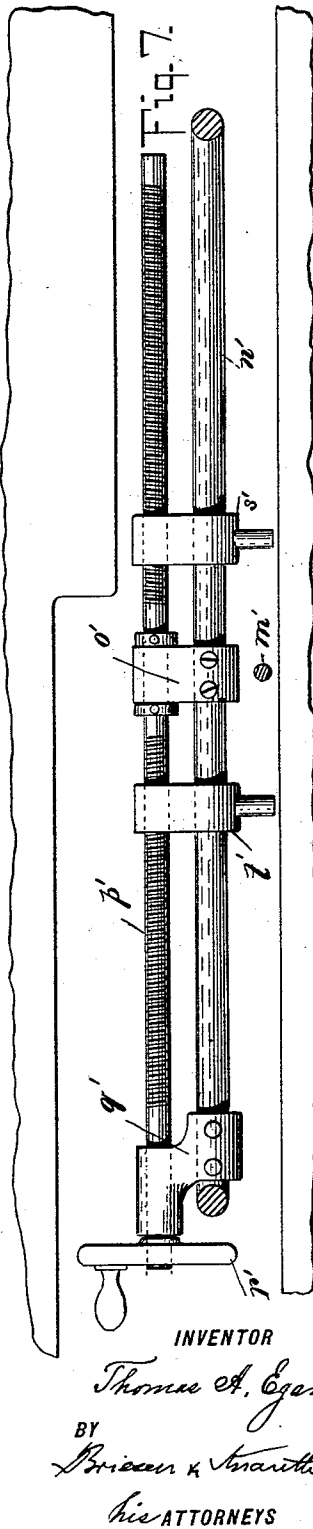
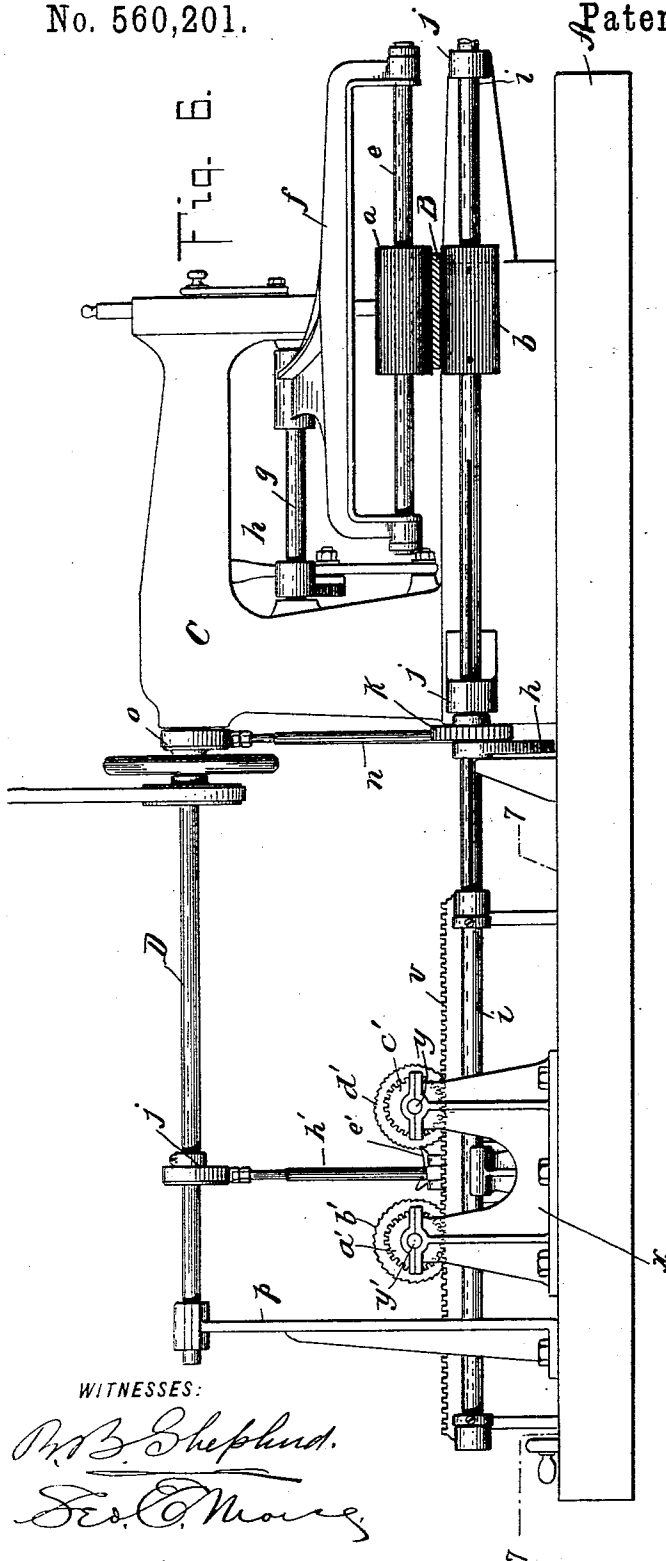
(No Model.)

3 Sheets—Sheet 3.

T. A. EGAN.
BELT STITCHING MACHINE.

No. 560,201.

Patented May 19, 1896.



UNITED STATES PATENT OFFICE.

THOMAS A. EGAN, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO THE NEW JERSEY CAR SPRING AND RUBBER COMPANY, OF SAME PLACE.

BELT-STITCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 560,201, dated May 19, 1896.

Application filed September 7, 1895. Serial No. 561,746. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EGAN, a resident of Jersey City, Hudson county, State of New Jersey, have invented a new and useful Improvement in Belt-Stitching Machines, of which the following is a specification.

My invention relates to belt-stitching machines, and has for its object to produce a simple, cheap, and efficient machine which will stitch or sew a belt, meantime feeding the belt to the sewing mechanism from two different directions.

To this end my invention consists in the construction hereinafter set forth and claimed.

My invention will be understood by reference to the accompanying drawings, in which—

Figure 1 is a plan view of a machine embodying my invention. Fig. 2 is an end elevation looking in the direction of the arrow in Fig. 1. Fig. 3 is an enlarged broken-away detail view showing the pawl-and-ratchet feed mechanism for the feed-carriage and the shifter-bar thereof, the view being partly in section, the section being taken on line 3 3 of Fig. 2. Fig. 4 is a section of the pawl-and-ratchet feed mechanism on line 4 4 of Fig. 3. Fig. 5 is a section of the shifter-bar on line 5 5 of Fig. 3. Fig. 6 is a side elevation of the machine, looking from right to left across Fig. 1. Fig. 7 is an enlarged plan detail view, partly in section, showing the shifting mechanism for operating the shifter-bar of the pawl-and-ratchet feed mechanism. This view is taken on the line 7 7 of Fig. 6.

Stated in general terms the apparatus which I have shown, and which constitutes one form of my invention, consists of a sewing-machine proper and mechanism for feeding the belt longitudinally to the sewing-machine and mechanism for reciprocating the belt laterally at the same time that it is fed forward longitudinally, so that the line of stitches will run, not longitudinally of the belt, but in a zigzag direction on the belt. The mechanism for reciprocating the belt in a lateral direction consists of a feed-carriage fed forward and backward by well-defined step-by-step movements by means of a suitably-driven mechanism, the step-by-step feed bearing a definite fixed ratio to the movements of the sewing-needle.

The invention further consists in means hereinafter described and claimed for reversing the movement of the feed-carriage.

In the drawings, A is a suitable bed-plate upon which the sewing-machine C is mounted. This sewing-machine is adapted to sew or stitch the belt B, which is fed forward by the usual gripper feed-rolls *a b* and guided by the usual guides *c d*. The gripper feed-roll *a* is hung loosely upon the rod *e* and movable laterally thereupon. This rod *e* is carried in a stirrup or hanger *f*, mounted upon a rock-shaft *g*, which is provided with a rocking handle *h*, so that the shaft may be rocked to raise or lower the roller *a* in order to remove the belt from the rolls or to adjust the distance of the rolls apart. The gripper feed-roll *b* is mounted upon a shaft *i*, which is inserted in and movable longitudinally through a pair of brackets *j*. Splined upon this shaft *i* is a ratchet-wheel *k* with which coöperates a pawl *l*, carried upon a link *m*, (see Fig. 2,) which is swung by a connecting-rod *n*, worked by an eccentric *o* upon the main shaft D of the sewing-machine.

The main shaft D, which drives the sewing-machine is supported at its end in a bearing *p* and reciprocates the connecting-rod *n* in order to step the ratchet *k* around so as to rotate the shaft *i* and the gripper feed-roll *b*. The rotation of this gripper feed-roll *b* is transmitted to the loose gripper feed-roll *a*, and the movement of the two rolls serves to feed the belt B longitudinally through the machine. The guides *c d* are mounted upon a rod *q*, which passes through perforated lugs or brackets *r s*. The rod *q* and the shaft *i* are connected by cross bars or braces *t u*, which in turn are connected by a rack *v*, the whole constituting a feed-carriage for the gripper feed-rolls and the adjustable guides.

It will be obvious that a back-and-forth movement of the feed-carriage will cause the gripper feed-rolls and guides to be reciprocated across the line of longitudinal feed of the belt. This reciprocation may be effected by the following mechanism: Rising from the bed-plate of the machine are standards *w x*, in which are journaled shafts *y z*. The shaft *y* carries a ratchet-wheel *b'* and a pinion *a'*, which meshes with the rack *v*. The shaft

2 carries a pinion c' and the ratchet-wheel d' .
 Located in the space between the ratchets b'
 d' is a double-faced pawl e' , which is pivoted
 at f' upon a slide g' , which is pivotally con-
 5 nected to an eccentric-rod h' , which is recip-
 rocated by an eccentric j' on the main shaft D .
 By referring to Fig. 3 it will be noted that
 the pawl e' is in engagement with the ratchet b'
 and that an upward movement of the connect-
 10 ing-rod h' and slide g' will step the ratchet-
 wheel b' around in the direction of the arrow.
 This will cause rotation of the shaft y and
 pinion y' and will cause the feed-carriage to
 be moved longitudinally in the direction of
 15 the arrow in Fig. 1. It will also be obvious
 that if the pawl e' be engaged with the ratchet
 d' the direction of the feed will be reversed.
 By properly reversing the feed of the feed-
 carriage in the manner above indicated the
 20 belt is fed laterally while it is being fed for-
 ward in the direction of its length by the grip-
 per feed-rolls, so that the line of stitching on
 the belt will be zigzag or undulated, as shown
 at b^3 in Fig. 1. This reversing of the move-
 25 ment of the feed-carriage may be done in any
 suitable manner; but I prefer to reverse the
 movement by the following means: Pivoted
 upon the slide g' is a pivoted shifter-block k' ,
 which is provided with a spring-pressed spur
 30 l' , which enters a notch f^2 in the tail of the pawl
 e' . This shifter-block is provided with a tail
 m' , which projects downward toward the bed
 of the machine. Carried by the feed-carriage
 is a guide-rod n' . (Seen clearly in Figs. 1,
 35 4, and 7.) Mounted upon this guide-rod is a
 guide-supporting block o' , through which
 loosely passes a screw-shaft p' , which is also
 loosely supported in a bracket q' , mounted
 upon the shifter-rod. The screw-shaft p' may
 40 be provided with a hand-wheel r' or other
 suitable turning device. A pair of abutments
 $s' t'$ slide loosely upon the shifter-rod n' and
 are tapped with screw-threaded apertures,
 through which the screw-shaft passes. The
 45 screw-shaft is oppositely threaded in its sepa-
 rate sections, so that the turning of the hand-
 wheel will cause the abutments $s' t'$ to ap-
 proach one another or to separate from one
 another, so that the extent of movement of
 50 the feed-carriage may be regulated by this
 means, as will be hereinafter set forth. The
 whole shifting mechanism just described—
 that is to say, the shifter-rod n' with its screw-
 shaft and abutments—moves with the feed-
 55 carriage, and the tail m' of the shifter-bar ex-
 tends at all times into the path of movement
 of the abutments, so that the abutments $s' t'$
 will strike this tail to swing the shifter-bar
 on its pivot to cause the pawl to be swung on
 60 its pivot so as to engage with one or the other
 of the ratchet-wheels $b' d'$.

The detailed operation of my device is as
 follows: When it is desired to sew a belt with
 zigzag stitches, the limits of the lateral feed
 65 of the belt are first fixed by adjusting the
 distance apart of the abutments $s' t'$. This,
 as before explained, is effected by turning the

screw-shaft p' by means of the hand-wheel r' .
 The belt is then fed to the gripper feed-rolls
 and guide d , the rotation of the main shaft
 D serving to step the shaft i around, so as to
 70 cause the gripper feed-rolls to rotate and feed
 the belt forward in the direction of its length,
 the eccentric j on the main cam-shaft at the
 same time serving to step one of the ratchet-
 75 wheels b' or d' around, so as to effect the lat-
 eral feed. When the limit of movement of
 the lateral feed has been reached—that is to
 say, when the stitching has approached as
 near the edge of the belt as is desired, which
 80 limit is fixed beforehand—the abutment s' or
 t' , as the case may be, contacts with the tail
 m' of the shifter-bar k' , and, swinging the
 same on its pivot, disengages the pawl from
 the ratchet with which it is in engagement
 85 and engages it with the opposite ratchet. The
 machine continuing to work, the belt is fed
 forward and the lateral feed is in a direction
 opposite to its former direction. When the
 limit of movement in this lateral direction
 90 has been reached, the other abutment comes
 in contact with the tail of the shifter-bar and
 again shifts the pawl into engagement with
 the ratchet with which it was first engaged.

It will be observed that the shaft i acts as
 95 a shaft to rotate the feed-roll of the machine
 and at the same time acts as a part of the
 feed-carriage to provide the lateral feed of
 the belt, tending also to guide and support
 other parts of the device. It is by these and
 100 other means that the simplicity of construc-
 tion and efficiency of operation in my ma-
 chine are attained.

Now while I have shown one form of my
 invention and have described the same in
 105 positive terms, I would have it understood
 that I do not mean to limit myself to the con-
 struction described and illustrated; but

What I claim, and desire to secure by Let-
 110 ters Patent, is—

1. The combination with a sewing-machine,
 of a feeding-carriage, a rack-bar carried by
 said feeding-carriage, two gear-wheels mesh-
 ing with said rack-bar and adapted to move
 the carriage, two ratchet-wheels in the same
 115 line having the teeth thereof extending in op-
 posite directions, one of said ratchet-wheels
 being fixed upon each of the shafts which
 carry the gear-wheels, a single double-faced
 pawl and means for automatically moving and
 120 engaging said pawl with either of the said
 ratchet-wheels, whereby the feeding-carriage
 will be fed backward and forward, substan-
 tially as described.

2. The combination with a sewing-machine,
 125 of a feeding-carriage, a rack-bar carried by
 said feeding-carriage, two gear-wheels mesh-
 ing with said rack-bar and adapted to move
 the carriage, two ratchet-wheels in the same
 line having the teeth thereof extending in op-
 130 posite directions, one of said ratchet-wheels
 being fixed upon each of the shafts which
 carry the gear-wheels, a single double-faced
 pawl, means for reciprocating the said pawl

to rotate a ratchet-wheel, adjustable stops carried upon said carriage and a pivoted shifter-block contacting with the tail of the pawl and adapted to be swung upon its pivot by the stops upon the carriage to automatically throw the pawl into engagement with one of the ratchet-wheels to move the carriage in one direction and to throw the pawl into engagement with the other ratchet-wheel to move the carriage in the opposite direction, substantially as described.

3. The combination with a sewing-machine, of a feeding-carriage, a rack-bar carried by said feeding-carriage, two gear-wheels meshing with said rack-bar and adapted to move the carriage, two ratchet-wheels in the same line having the teeth thereof extending in opposite directions, one of said ratchet-wheels being fixed upon each of the shafts which carry the gear-wheels, a single double-faced pawl, means for reciprocating the said pawl to rotate a ratchet-wheel, adjustable stops carried upon said carriage, a single right and left handed screw-threaded shaft for adjusting said stops toward and away from each other and a pivoted shifter-block contacting with the tail of the pawl and adapted to be swung upon its pivot by the stops upon the carriage to automatically throw the pawl into engagement with one of the ratchet-wheels to move the carriage in one direction and to throw the pawl into engagement with the other ratchet-wheel to move the carriage in the opposite direction, substantially as described.

4. In a machine for stitching belts, the combination with a sewing-machine, of a feeding-carriage comprising in its structure a rotary longitudinally-movable shaft upon which is mounted a roll which with means cooperating therewith feeds the belt in the direction of its length when such shaft is rotated and which carries the belt laterally with it when the shaft together with the carriage is moved, means for rotating said shaft, a rack-bar carried by said feeding-carriage, two gear-wheels meshing with said rack-bar and adapted to

move the carriage, two ratchet-wheels in the same line having the teeth thereof extending in opposite directions, one of said ratchet-wheels being fixed upon each of the shafts which carry the gear-wheels, a single double-faced pawl, means for automatically moving and engaging said pawl with either of said ratchet-wheels, whereby the feeding-carriage will be fed backward and forward, substantially as described.

5. In a machine for stitching belts, the combination with a sewing-machine, of a feeding-carriage comprising in its structure a rotary longitudinally-movable shaft upon which is mounted a roll which with means cooperating therewith feeds the belt in the direction of its length when such shaft is rotated and which carries the belt laterally with it when the shaft together with the carriage is moved, a ratchet-wheel splined upon said shaft, means for intermittently rotating said ratchet-wheel, a rack-bar carried by said feeding-carriage, two gear-wheels meshing with said rack-bar and adapted to move the carriage, two ratchet-wheels in the same line having the teeth thereof extending in opposite directions, one of the ratchet-wheels being fixed upon each of the shafts which carry the gear-wheels, a double-faced pawl, means for reciprocating said pawl to rotate a ratchet-wheel, adjustable stops carried upon said carriage and a pivoted shifter-block contacting with the tail of the pawl and adapted to be swung upon its pivot by the stops upon the carriage to automatically throw the pawl into engagement with one of the ratchet-wheels to move the carriage and its rotary and longitudinally-movable shaft in one direction and to throw the pawl into engagement with the other ratchet-wheel to move the carriage and its shaft in the opposite direction, substantially as described.

THOMAS A. EGAN.

Witnesses:

GEO. E. MORSE,
HARRY M. TURK.