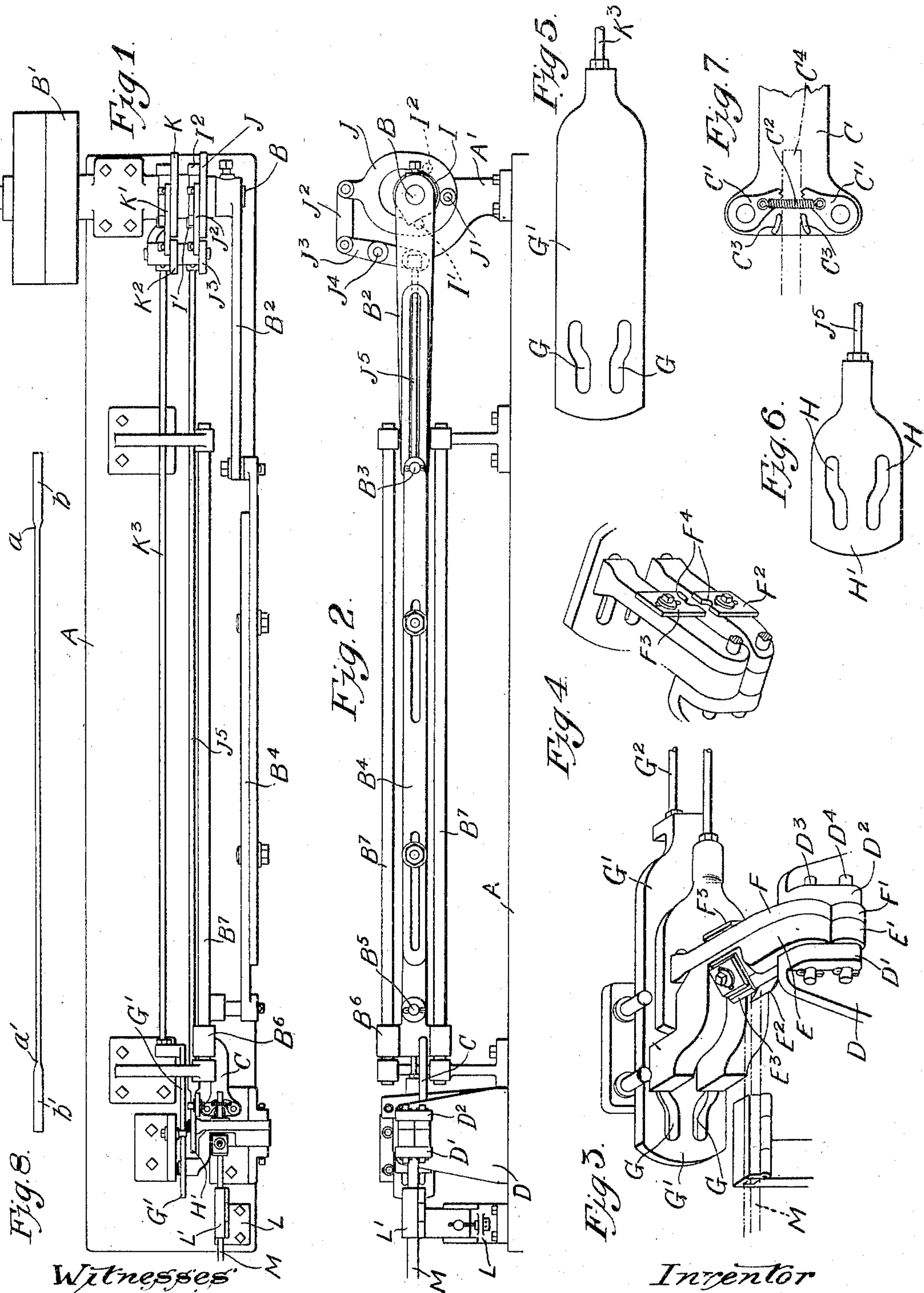


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MACHINE FOR MAKING STRAPS FOR LOOM HARNESS.

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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR MAKING STRAPS FOR LOOM-HARNESS.

SPECIFICATION forming part of Letters Patent No. 784,148, dated March 7, 1905.

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*To all whom it may concern:*

Be it known that I, JOHN R. FITTON, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Machines for Making Straps for Loom-Harnesses, of which the following is a specification accompanied by drawings forming a part of the same, in which—

Figure 1 represents a top view of a machine embodying my invention for rounding the central section of loom-harness straps. Fig. 2 is a side elevation of the same. Fig. 3 is a perspective view of the mechanism for opening and closing a pair of cutting-knives by which a portion of the stock is removed from that part of the strap to be rounded. Fig. 4 is a perspective view of the compressing-dies for rounding the central portion of the strap. Fig. 5 is a side view of the slotted plate for opening and closing the cutting-knives. Fig. 6 is a side view of the slide for opening and closing the compressing-dies. Fig. 7 is a side view of the gripping-jaws for engaging the strap as it is drawn between the cutting-knives and compressing-dies, and Fig. 8 represents a completed loom-harness strap.

Similar letters of reference refer to similar parts in the different views.

The object of the machine embodying my present invention is to trim away a portion of the stock throughout the central part of the loom-harness strap and to compress the parts so trimmed into a round or circular form in cross-section, leaving the ends of the strap their normal size and adapted to be attached to the loom-harness frame, while the central part of the strap is rounded to facilitate its movement over a scored pulley upon which the harness-frame is suspended. To accomplish this result by my machine, I provide a pair of reciprocating jaws adapted to seize one end of the harness-strap and to draw the same between a pair of cutting-knives arranged on opposite sides of the strap and at an oblique angle to its line of motion, whereby a portion of the stock is removed from the strap, and by placing behind the knives a pair of plates having opposing semicircular notches in their

edges which compress that portion of the strap trimmed by knives to render it cylindrical in cross-section. The action of the cutting-knives and compressing-dies is controlled by attaching the knives and dies to levers which are pivoted at one end to the framework and have their opposite ends entering curved slots in reciprocating plates, by which the levers are opened and closed to carry the knives and compressing-dies toward and away from the strap at proper periods of its movement between them.

Referring to the accompanying drawings, A denotes the base-plate, upon which the operative mechanism of the machine is supported.

Journaled in suitable bearings upon a post A' is a main driving-shaft B, to which power is applied by a belt-pulley B'. Attached to one end of the main driving-shaft B is a crank-arm B<sup>2</sup>, which carries a stud B<sup>3</sup>, connected by a link B<sup>4</sup> with the stud B<sup>5</sup>, carried by a sliding head B<sup>6</sup>, to which a reciprocating movement is imparted along the parallel rods B<sup>7</sup> by the rotation of the crank-arm B<sup>2</sup>. Projecting from the head B<sup>6</sup> is a horizontal draw-plate C (shown on a larger scale in Fig. 7) and carrying pivoted thereon strap-engaging jaws C' C', having their free ends preferably serrated to engage the strap, against where they are drawn by the tension of a spiral spring C<sup>2</sup>. When the strap is removed, the jaws C' are normally held by the spring C<sup>2</sup> against the studs C<sup>3</sup> C<sup>3</sup>, which also serve as guides to direct the entrance of the strap between the free ends of the jaws in the position shown by the broken lines C<sup>4</sup>, Fig. 7.

Mounted upon the base-plate A is a post D, provided with laterally-projecting brackets D' D<sup>2</sup>, which support the studs D<sup>3</sup> D<sup>4</sup>, upon which are pivoted levers E E', which support the oblique cutting-knives E<sup>2</sup> and E<sup>3</sup>. Pivoted upon the studs D<sup>3</sup> and D<sup>4</sup> are levers F F', which carry the dies F<sup>2</sup> and F<sup>3</sup>, provided in their opposing edges with semicircular notches F<sup>4</sup>. The free ends of the levers E and E' engage curved slots G G in a reciprocating plate G'. The free ends of the levers F F' engage curved slots H H in a reciprocating plate H'. The reciprocating movement of the plates G' and H' by means of their curved slots serves to



swing the levers  $E E'$  and  $F F'$  at the proper time to separate the knives  $E^2 E^3$  and dies  $F^2 F^3$  to allow the end of the harness-strap to be inserted between them. The plates  $G'$  and  $H'$  are then moved longitudinally at the proper time to bring the knives  $E^2 E^3$  against the harness-strap while the central section of the strap is passing between the knives, whereby a portion of the stock is removed, and the compressing-dies  $F^2$  and  $F^3$  are likewise carried against the reduced section of the strap to compress the same into a rounded or circular shape. The movement of the plates  $G'$  and  $H'$  is accomplished by means of a pair of cams carried on the main driving-shaft  $B$ , one of said cams being shown at  $I$ , Fig. 2, arranged as the shaft  $B$  rotates to laterally strike against studs  $I^1$  and  $I^2$ , carried upon a swinging yoke  $J$ , pivoted at  $J'$  upon the post  $A'$  and having its free end pivotally connected by a link  $J^2$  with one end of a rocking lever  $J^3$ , pivoted upon a fixed stud  $J^4$ . The opposite end of the rocking lever  $J^3$  is connected by a rod  $J^5$  with the reciprocating slotted plate  $H'$ . A similar cam to the cam  $I$  (not shown) is carried by the main driving-shaft  $B$  and actuates in a similar manner a yoke  $K$ , connected by a link  $K'$  with a rocking lever  $K^2$ , a duplicate of the lever  $J^3$ , which is similarly connected by a rod  $K^3$  with the reciprocating slotted plate  $G'$ .

Adjustably supported on a post  $L$  is a guide-trough  $L'$ , in which a rectangular strap  $M$  is presented to the machine and pushed between the open knives  $E^2 E^3$  and dies  $F^2 F^3$  past the guide-studs  $C^3 C^3$  on the draw-plate  $C$  far enough to be engaged by the ends of the gripping-jaws  $C'$ , as illustrated in Fig. 7. Rotary motion is then imparted to the shaft  $B$ , which draws the strap  $M$  between the cutting-knives and compressing-dies. After a portion of the strap has passed the cutting-knives the latter are carried into contact with the strap, so as to reduce the diameter of the strap between the points  $a a'$ , Fig. 8, and when the reduced portion of the strap has reached the compressing-dies  $F^2 F^3$  they are pressed against the strap by the movement of the reciprocating slotted plate  $H'$  to round the strap, and when the point  $a'$  reaches the knives and compressing-dies they are again opened by the reverse movement of the plates  $G'$  and  $H'$ , thereby leaving the ends  $b b'$  of the strap their normal size and shape. After the cutting-knives  $E^2 E^3$  are carried into contact with the strap it is held from sagging by the trough  $L'$ , which insures the delivery of the strap to the knives in a straight line.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine of the class described, the combination of the following instrumentalities,

means for imparting a longitudinal movement to a strap, knives for reducing the diameter of the strap, means for moving said knives into action, dies for compressing the strap and means for moving said dies into action.

2. In a machine of the class described the combination of a reciprocating draw-plate provided with means for engaging one end of the strap and imparting a longitudinal movement thereto, a pair of fixed cutting-knives held in an oblique position to the line of motion of the strap, means for carrying said knives into continuous contact with the strap at a predetermined period in its movement and a guide-trough through which the strap is drawn, held in fixed relation to said knives.

3. The combination with means for imparting a longitudinal movement to a strap, of a pair of fixed cutting-knives held in an oblique position to the line of motion of the strap, means for carrying said knives into continuous contact with the strap at a predetermined period in its movement and a guide-trough through which the strap is drawn, held in fixed relation to said knives.

4. The combination with a strap-supporting trough, of a reciprocating draw-plate provided with means for engaging the strap, a pair of knives, means for moving the knives against the strap, means for moving the knives away from the strap, and means for applying pressure to the strap during its longitudinal movement, substantially as described.

5. The combination with a reciprocating draw-plate having means for engaging the strap, of a pair of plates provided in the opposing edges with semicircular notches, and means for moving said notched plates against the strap, substantially as described.

6. The combination of a reciprocating draw-plate having means for engaging the strap, a pair of pivoted levers, knives carried by said levers, a reciprocating plate having curved slots engaging the free ends of said levers, whereby the knives are moved toward and away from the strap, substantially as described.

7. The combination of a reciprocating draw-plate having means for engaging the strap, a pair of pivoted levers, compressing-dies carried by said levers, and a reciprocating slotted plate engaging the free ends of said levers, whereby said dies are moved toward and away from the strap, substantially as described.

Dated this 16th day of May, 1903.

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Witnesses:

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