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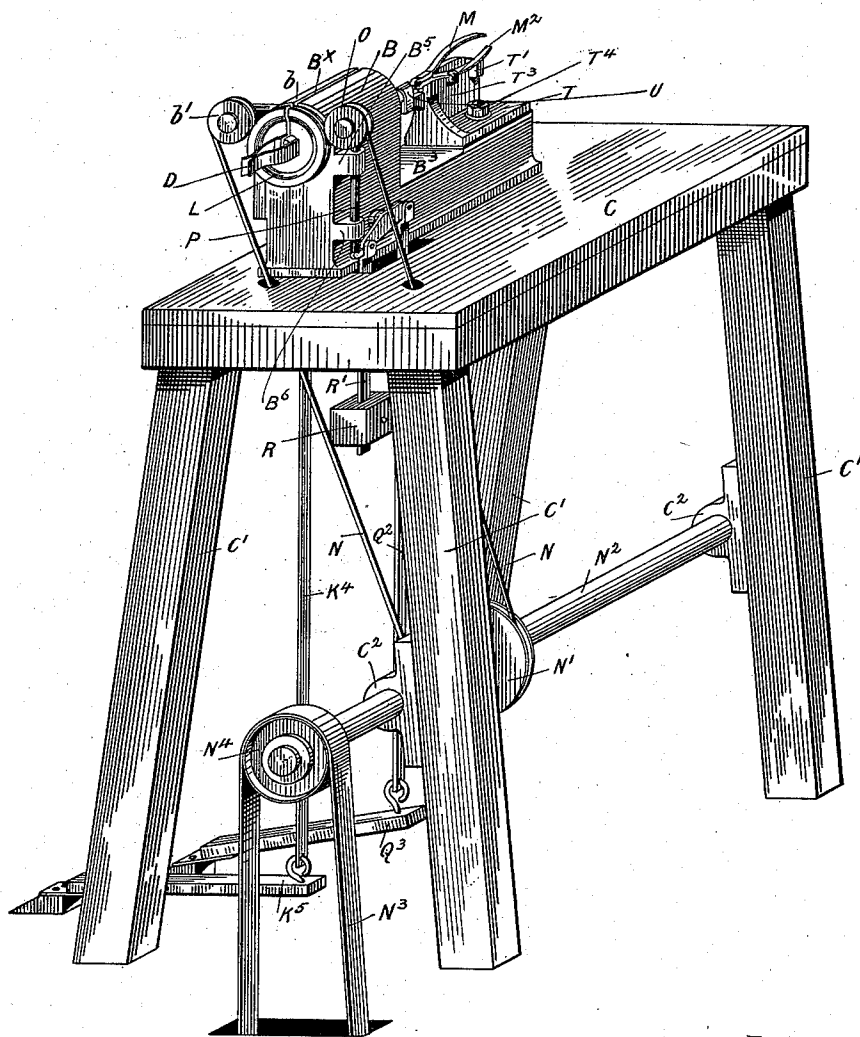
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J. L., J. E. & S. FAIRE.
MACHINE FOR TAGGING SHOE LACES.

No. 535,493.

Patented Mar. 12, 1895.

Fig. 1.



Witnesses

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(No Model.)

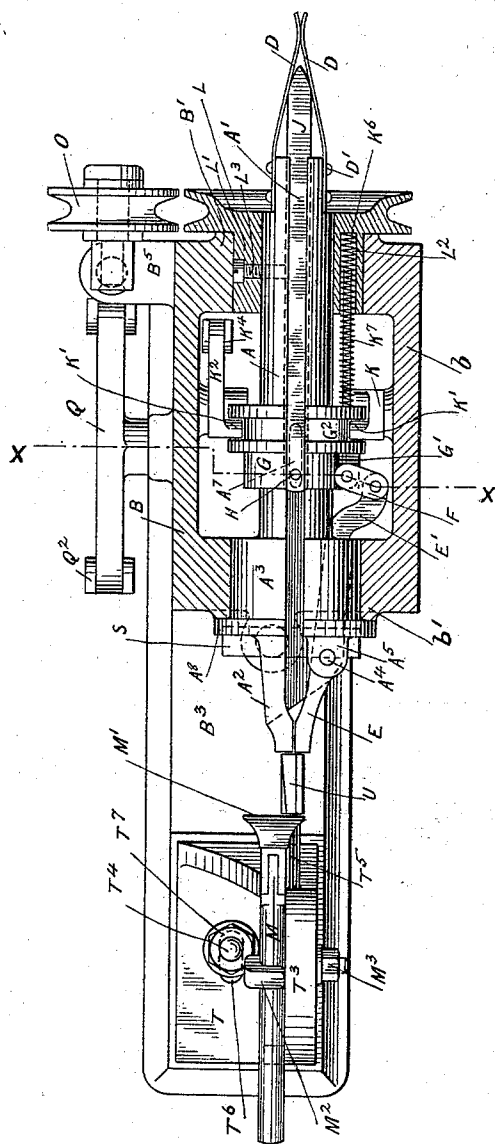
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Fig. 2.



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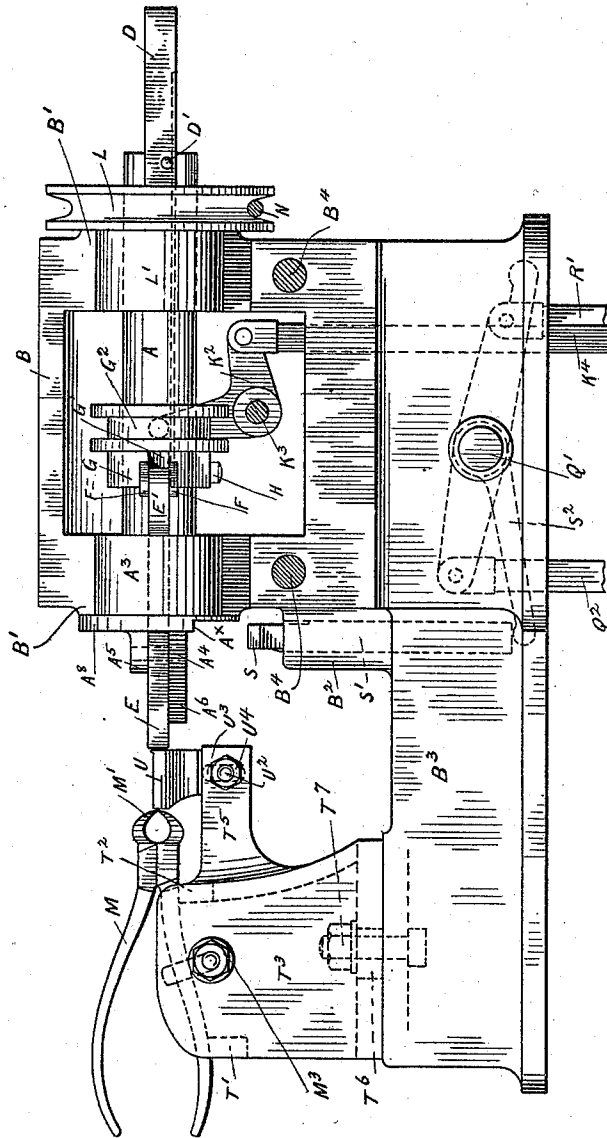
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Fig. 3.



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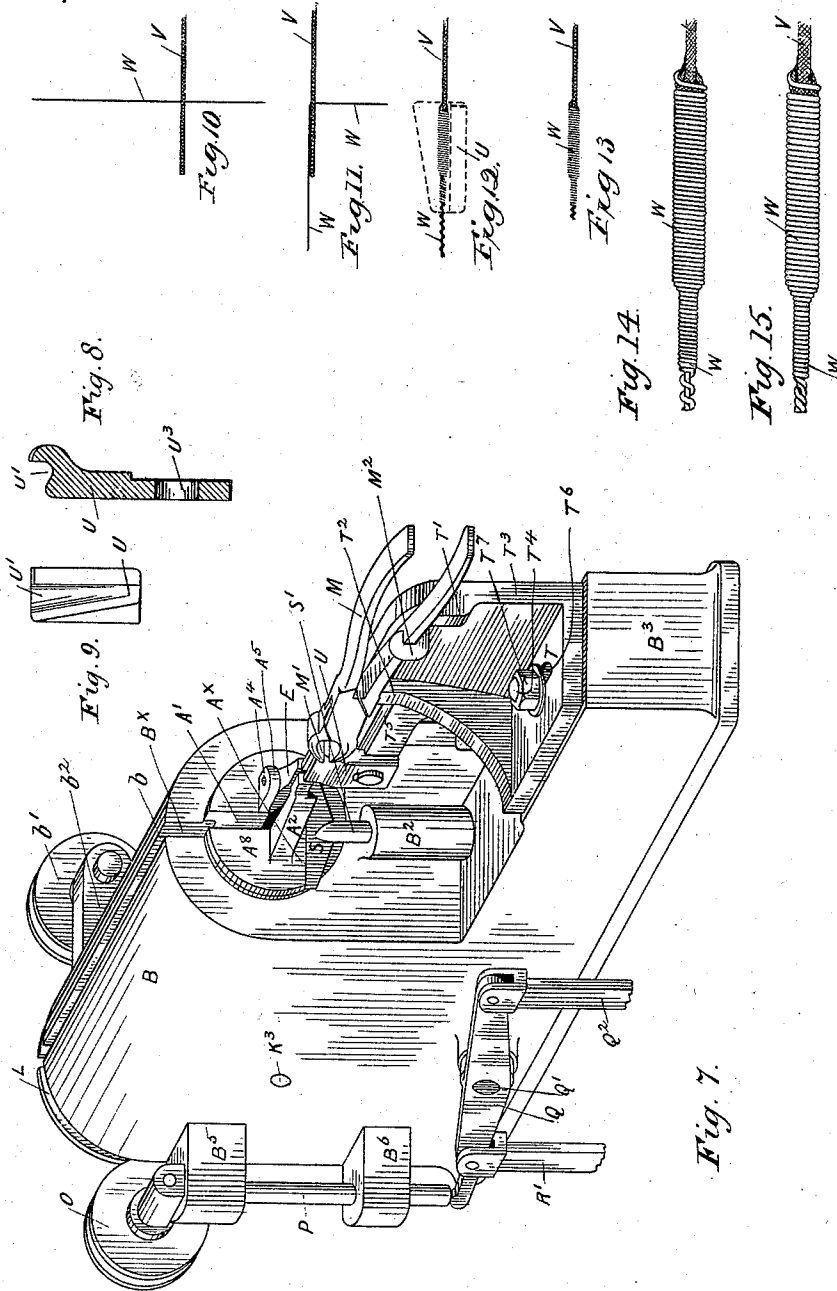
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5 Sheets—Sheet 5.

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UNITED STATES PATENT OFFICE.

JOSEPH LOUIS FAIRE, JOHN EDWARD FAIRE, AND SAMUEL FAIRE, OF
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MACHINE FOR TAGGING SHOE-LACES.

SPECIFICATION forming part of Letters Patent No. 535,493, dated March 12, 1895.

Application filed June 26, 1893. Serial No. 478,921. (No model.) Patented in England April 14, 1893, No. 7,632; in Germany July 4, 1893, No. 76,085; in Belgium August 5, 1893, No. 105,843, and in France August 8, 1893, No. 232,042.

To all whom it may concern:

Be it known that we, JOSEPH LOUIS FAIRE, JOHN EDWARD FAIRE, and SAMUEL FAIRE, subjects of the Queen of England, residing at Leicester, England, have invented certain new and useful Improvements in or Relating to the Tagging of Laces and in Machinery or Apparatus Therefor, (for which we have obtained patents in England, No. 7,632, dated April 14, 1893; in Belgium, No. 105,843, dated August 5, 1893; in France, No. 232,042, dated August 8, 1893, and in Germany, No. 76,085, dated July 4, 1893,) of which the following is a specification.

This invention has reference to the tagging of laces and is designed with a view of constructing a machine by means of which laces may have connected thereto a peculiar formation of tag such as has heretofore been made by hand.

The tag (such as the machine which forms the subject of the present invention, is designed to produce) consists of a piece of wire passed through the lace at right angles thereto near the end of the same. The portion of wire so passed through the lace is then bent so as to lie parallel thereto and projects slightly beyond the end thereof. The opposite end of the wire is then wound or coiled round the lace and straight portion of the wire commencing at the point where it passes through the lace and continuing until the end of the straight wire is reached, when the wire is severed and the complete tag thus formed. To prevent the tag becoming uncoiled the two ends thereof are twisted round each other.

The invention will be understood from the following description in reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the lace tagging machine constructed according to this invention. Fig. 2 is a plan partly in section and Fig. 3 a side elevation (with the cover removed) of such portion of the machine as is located on the supporting table. Figs. 4 and 5 are elevations of respectively the right and left hand ends of the machine above the table, the positions being determined when viewing the front or treadle side of the machine.

Fig. 6 is a transverse section taken on the line xx of Fig. 2. Fig. 7 is a perspective view of the machine above the supporting table showing the end opposite to that shown in Fig. 1. Figs. 8 and 9 are section and plan respectively of the plate U. Figs. 10, 11, 12 and 13 are views of the lace and tag showing the latter in different stages of formation. Fig. 14 is a view of a completed tag drawn to an enlarged scale. Fig. 15 is a similar view but with the two ends of the tag twisted round each other.

The lace to be tagged is inserted in a slot A' formed in the direction of the length of a preferably cylindrical lace carrying block or device A carried in bearings B' in the cover plate B b . The cover plate B b is formed in two parts the part B being formed integrally with the bed plate B^3 and the part B is removable and to connect it to the former it has two openings therein which pass over screwed pins B^4 , Fig. 3, fixed to the part B and the whole is secured together by nuts B^5 thereon as shown in Figs. 4 and 5.

The lace carrying block is furnished at each end with mechanism for gripping the lace and holding it in position while the tag is being connected thereto. This mechanism at one end preferably comprises as shown most clearly in Fig. 2, a clip consisting of two spring plates D D fixed by screws D' to the side of the lace carrying block and at one end of the latter. At the opposite end it consists of a fixed jaw A^2 formed integrally with the enlarged portion A^3 of the lace carrying device and a movable jaw E. The latter is pivoted at A^4 between lugs A^5 A^6 Figs. 3 and 7, formed at the end of the lace carrying device A. The lower lug A^6 extends partly across the end of the lace carrying block and underneath the end of the longitudinal slot therein, Figs. 2, 3, and 7, so that the end portion of the lace may be supported thereon during the tagging operation.

In order to open the gripping mechanism to allow the operator to place therein the lace to be tagged the movable jaw is formed with an extension or prolongation E' pivoted between two link plates F Figs. 2, 3, and 6, which

are again pivoted to a horizontal projection G' on a circumferentially grooved sliding sleeve or device G slotted correspondingly with the block A, the said sleeve being connected with A by a pin H or equivalent engaging with a slot A' Figs. 2 and 6 in the under side of the lace carrying block. The pin H also passes through a sliding plate J located within the lace carrying block and whose forward end is between and against the inner faces of the spring plates D forming the spring clip.

It is obvious that upon the sleeve being slid along the lace carrying block A the link plates F will cause the movable jaw E to turn on its pivot A⁴ and move away from the fixed jaw A² and simultaneously the sleeve G will move forward the sliding plate J so that the end of the latter is projected between the plates D to press them open.

To slide the sleeve along the block A as mentioned it has located within its groove G² a short horizontal extension or nose K' formed on the end of each of two levers K K² (the latter a bell crank lever) fixed on opposite ends of a rock shaft K³ Fig. 6 having a bearing in each side of the cover plate B b. The bell crank lever K² has connected to its lower arm a connecting rod K⁴ Figs. 3 and 6 attached to a treadle K⁵ Fig. 1, under the machine. Upon the operator depressing the said treadle the connecting rod K⁴ is lowered, thereby causing the bell crank lever K² to move the sleeve G on the carrying block A and to open the gripping mechanism as before described. When the gripping mechanism has been thus opened the lace to be tagged is placed in the slot in the lace carrying block so as to admit of its ends passing between the said gripping mechanism whereupon the operator's foot is removed from the treadle and immediately the said gripping mechanism closes upon the ends of the lace and holds the latter in position for tagging. The closing of the gripping mechanism is automatically effected by the sliding sleeve G being returned to its original position under the influence of a spiral spring K⁶ Fig. 2, surrounding a rod K⁷ secured at one end to the side of the sleeve G while the opposite end is located in a preferably cylindrical cavity L² in the boss L' of the pulley L. While the lace V is held in this position by the gripping mechanism the operator pushes through near its end at a right angle thereto a piece of ordinary tagging wire W as shown in Fig. 10. That portion of the wire so passed through the end of the lace is then bent by the operator so as to lie parallel to the lace and project a short distance beyond the end thereof as indicated in Fig. 11. The lace carrying block and the lace carried thereby are then rotated and while revolving the operator gradually guides the wire toward the end of the lace so that it becomes coiled or wound both round the lace and the piece of wire parallel therewith as indicated in Fig. 12. When the end of the wire is reached the op-

erator severs it by means of the cutting pliers M hereinafter referred to and the complete tag as shown in Figs. 13 and 14 is thus formed.

Just immediately prior to severing the wire the tag may be held between the jaws of the pliers M while the lace carrying device makes several revolutions the effect of which is to twist the two ends of the wire (viz:—the end of the straight wire and the end of the coiled wire) round each other as shown in Fig. 15 thereby preventing them from becoming disengaged. The operator then opens the gripping mechanism as already described, removes the lace from the lace carrying block and replaces it therein in a reversed position and tags the opposite end by repeating the process hereinbefore described.

For imparting rotary motion to the lace carrying block A the latter is provided at one end with preferably a grooved pulley L which may be connected thereto by a screw L³ Fig. 2, passing through the boss L' of the said pulley into the block A. A driving band or belt N passes under the pulley L on the lace carrying block and over two pulleys O b' one on each side thereof. The pulley b' is carried in a fixed bearing b² cast integrally with the cover plate b and the pulley O (hereinafter referred to as the belt tightening pulley) is movable in a vertical direction and is mounted on the upper end of an upright rod P kept in position by guides B⁵ B⁶ formed on the side of the cover plate B and by a pin P² whose end passes through the guides B⁶ and into a groove P' Fig. 4, in the rod P. The driving belt passes through openings in the table C Fig. 1, and under a pulley N' mounted on a shaft N² carried in bearings C² connected to the legs C' of the table C and driven by a belt N³ operated by any suitable motor and passing over a pulley N⁴ on the end of the shaft N².

To revolve the lace carrying block pulley L the driving band is tightened underneath the latter by raising the rod P carrying the belt tightening pulley O in its guides B⁵ B⁶ and for this purpose the lower end of the said rod P rests on one end of a lever Q mounted on the end of a shaft Q' and pivoted at its other end to a connecting rod Q² attached to a treadle Q³ Fig. 1 under the machine. The lowering of the treadle Q³ by the operator causes the lever Q to raise the rod P and pulley O thereon to tighten the belt N against the under side of the pulley L and drive it by frictional contact therewith. Upon the operator's foot being lifted off the treadle Q³ a counterweight R, connected by the strap or rod R' to the end of the lever Q which supports the rod P, restores the said lever Q and treadle Q³ to their original positions and the friction of the belt N on the belt tightening pulley O lowers the latter in relation to the lace carrying block pulley L which is thereby allowed to come to rest.

In stopping the machine after each tagging operation it is desirable in order to obtain the best results, that the lace carrying block A

should always come to rest with the slot A' uppermost and immediately under the slot B^x in the cover plate B b (i. e. in the position shown in the drawings) so that the lace may be at once laid in its proper position in the slot without it being necessary for the operator to adjust the slot in the lace carrying block relatively to the slot in the cover plate for this purpose. To stop the lace carrying block in this position the flange A⁸ on the latter is partly cut away or removed so as to leave a straight edge or flattened portion A^x Figs. 3 and 7, against which a straight edged plate S on the upper end of a rod or bar S' is elevated at the required time to arrest the motion of the said lace carrying block. The rod or bar S' moves in a guideway or tubular socket B² formed integrally with the bed plate B³ and its lower end rests on an arm S² carried on the shaft Q'. The rod S' is elevated for the purpose named at the same time as the operator's foot is removed from the treadle Q³ to admit of the belt tightening pulley being lowered as hereinbefore described. Upon this latter taking place the shaft Q' makes a partial revolution so that the arm S² thereon simultaneously raises the rod S' as previously mentioned. Upon the motion of the lace carrying block being arrested and the tagging of the lace finished the operator places the wire close to the end of the tag between the jaws M' of a pair of cutting pliers M or equivalent and severs the said wire after which the lace is removed from the machine. The lower member of the cutting pliers rests on two projections T' T² Figs. 1, 2, and 7, on the upward extension T³ of a plate T bolted at T⁴ to the bed plate B³ and is secured in position by a finger M² gripping the said member and tightened against the opposite side of the plate T³ by a nut M³ on the screwed end thereof.

The end of the lace while being tagged rests in a groove U' in the upper end of a plate U Figs. 1, 2, 3, 7, 8, and 9, attached by means of a screw bolt U² to the arm T⁵. The block U may be adjusted relatively to the lace carrying device for varying lengths of tags and for different thicknesses of laces.

For longer or shorter tags the block U is moved farther from or nearer to the lace carrying device for which purpose the plate T is furnished with a slot T⁶ which when the nut T⁷ is released admits of the plate T, arm T⁵ and block U being moved *en masse* to or from as desired.

To raise or lower the block U in relation to the lace carrying device for varying thicknesses of laces the said block U has a slot U³ therein through which the bolt U² passes and by releasing the nut U⁴ on the bolt, the block can be raised or lowered as desired.

We claim—

1. In a lace tagging machine, the combination with the frame, and the rotary head having the slot for the reception of the lace extending in to substantially the center, of the

clamp or nippers carried by the head for holding the lace, with means for opening and closing the clamp or nippers; substantially as described. 70

2. In a lace tagging machine, the combination with the frame and the rotary head having the radial slot extending in to substantially its center for the reception of the lace, of the clamp or nippers carried by the head for holding the lace, the longitudinally movable collar and its operating levers for manipulating the clamp or nippers; substantially as described. 80

3. In a lace tagging machine, the combination with the frame and rotary head having the axially arranged clamp for holding the lace, of the cutter supported on the frame opposite the clamp and a distance from the clamp equal to the length of the tag; substantially as described. 85

4. In a lace tagging machine the combination with the rotary head, having the axially arranged clamp for holding the lace, of the cutter adjustably supported on the frame opposite the clamp; substantially as described. 90

5. In a lace tagging machine, the combination with the rotary head, having an opening therethrough, of the grooved supporting block arranged in line with the opening and adapted to support the lace while being tagged; substantially as described. 95

6. In a lace tagging machine, the combination with the frame, the slotted rotary head journaled therein and having the axially arranged clamps for grasping the lace, of the grooved block mounted on the frame in front of the clamps and adapted to support the lace while being tagged; substantially as described. 100 105

7. In a lace tagging machine the combination with a revolving lace carrying device provided at one end with fixed and movable jaws and at the opposite end with spring clip plates for holding the lace in position while the tag is being formed thereon of mechanism to open the said gripping mechanism to permit of the lace being removed. 110

8. In a lace tagging machine the combination with the revolving lace carrying device and gripping mechanism thereof of a spring-controlled sliding sleeve, rocking shaft, levers thereon and connecting rod and treadle for operating said sleeve for the purpose described. 115 120

9. In a lace tagging machine, the combination with the frame having the slotted bearing, of the rotary head journaled in said bearing and having a slot adapted to register with the slot in the bearing, for the admission of the lace, and also having a transverse bearing, and a movable stop cooperating therewith to arrest the head with its slot in position to register with the slot in the bearing; substantially as described. 125 130

10. In a lace tagging machine the combination with a revolving lace carrying device slotted in the direction of its length and a flange thereon provided with a straight edge

of a rod or bar with a corresponding edge and rocking arm for operating the said rod or bar for the purpose described.

11. In a lace tagging machine the combination with the frame having the slotted bearing, and the rotary head journaled therein and having a slot for the reception of the lace, a stop bearing and a drive pulley, of the stop block cooperating with the bearing, a drive gear, a pulley for throwing said gear into operation to rotate the head, a shifter for the pulley and connections between the same and stop block, whereby as the drive gear is thrown out of operation the block is moved into position to arrest the head with the slots registering substantially as described.

12. In a lace tagging machine the combination of a revolving lace carrying block or device, longitudinal slot or groove therein, cover plate correspondingly slotted, pulley and lace

gripping mechanism on the block, sliding sleeve, links, bell crank lever, lever, arm, shaft, connecting rod and treadle for releasing the gripping mechanism, adjustable belt tightening pulley, rod, lever, arms and shaft for operating it, lever arm, adjustable bar and stop shoulder on revolving lace carrying block, adjustable tag supporting block and cutting device.

In testimony whereof we have hereunto set our hands in the presence of the two subscribing witnesses.

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JOHN EDWARD FAIRE.
SAMUEL FAIRE.

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GEO. BREWIN,
Clerk to the inventors.