

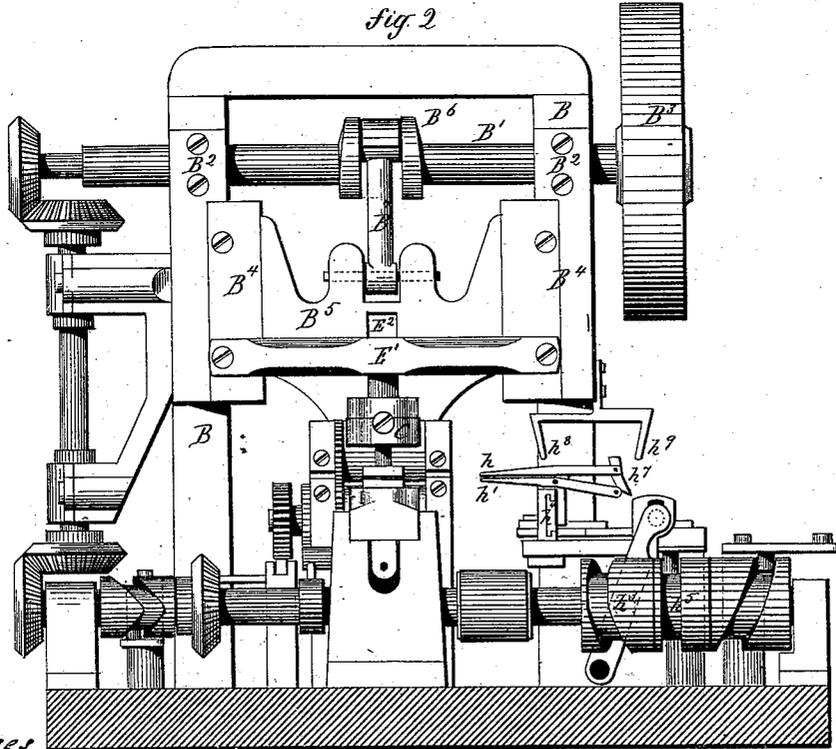
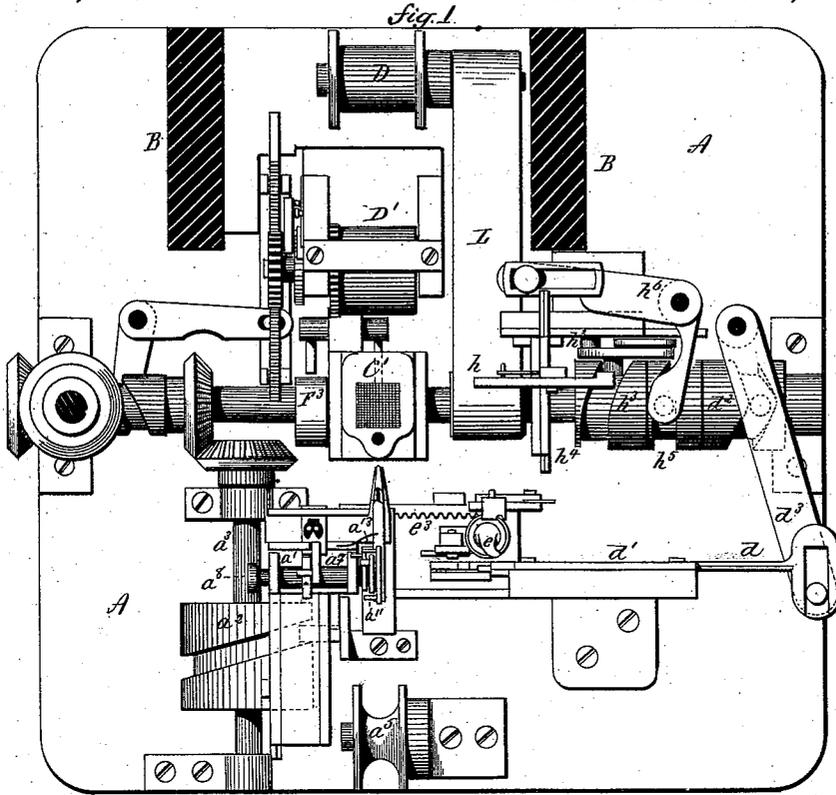
(Model.)

3 Sheets—Sheet 1.

C. M. RICHARDSON.  
Tag Machine.

No. 236,262.

Patented Jan. 4, 1881.



Witnesses  
Ed. Hummer  
Jos. C. Eble

Chas. M. Richardson  
Inventor  
By *[Signature]*



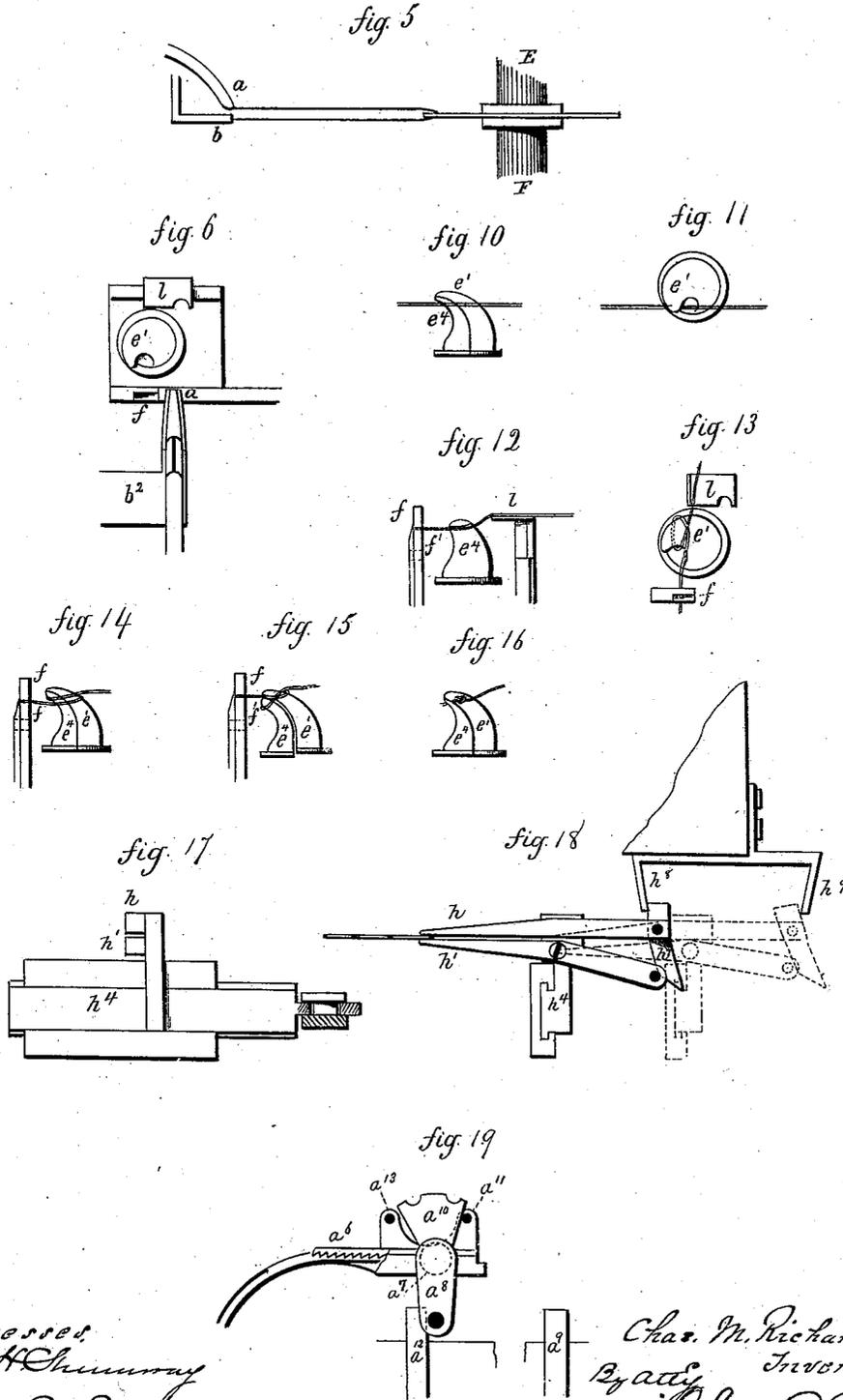
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3 Sheets—Sheet 3.

# C. M. RICHARDSON. Tag Machine.

No. 236,262.

Patented Jan. 4, 1881.



Witnesses:  
*J. H. Chumney*  
*Jose C. Earle*

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# UNITED STATES PATENT OFFICE.

CHARLES M. RICHARDSON, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO  
WILLIAM C. WILDMAN, OF SAME PLACE.

## TAG-MACHINE.

SPECIFICATION forming part of Letters Patent No. 236,262, dated January 4, 1881.

Application filed April 16, 1880. (Model.)

*To all whom it may concern:*

Be it known that I, CHARLES M. RICHARDSON, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented a new Improvement in Machines for Making Tags; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification.

This invention relates to the construction of a machine for making that class of paper tags which are provided with a loop of cord introduced through a perforation in the tag, the object being to cut and pierce the tag, introduce the cord, and tie the two ends of the cord together to complete the loop; and the invention consists in the construction as hereinafter described, and particularly recited in the claims.

A is the bed-plate, upon which the operative mechanism of the machine is arranged.

B B are two uprights supporting the driving-shaft B' in suitable bearings B<sup>2</sup>; power being applied to the shaft through a pulley, B<sup>3</sup>, or otherwise. On the uprights B<sup>2</sup> guides B<sup>4</sup> are placed, between which the cross-head or gate B<sup>5</sup> is arranged, and to which a vertical reciprocating movement is imparted by a crank or eccentric, B<sup>6</sup>, on the driving-shaft B', through a pitman, B<sup>7</sup>, substantially as in common punching or power presses.

The cross-head B<sup>5</sup> carries at its lower end a die or cutter, C, of the shape corresponding to the shape of the tag to be produced. Below the cutter C is a corresponding die, C', which, together with the cutter C, serves to cut the tag in similar manner to punching or cutting presses. The upper or movable die is provided with a punch, C<sup>2</sup>, and the lower die with a corresponding perforation, (see Fig. 3,) which, when the dies come together, punch the hole for the insertion of the cord.

The strip of paper from which the tags are to be cut is supplied from a roll, D, at the rear, and passes in between a pair of feed-rolls, D', (see Fig. 3,) to which the requisite intermittent movement is imparted to deliver to the die the requisite length of paper to form the

tag. Any feeding device which will thus deliver the paper will answer the same purpose.

Through the upper die there is a vertical spindle, E, rigidly attached to a stationary bar, E', there being an opening, E<sup>2</sup>, in the cross-head, through which this permanent connection is made. This spindle extends downward near to the lower die, its lower end fitted with a foot, E<sup>3</sup>, which rests upon the upper surface of the paper, but is smaller in extent than the tag, and remains stationary while the die C' moves up and down. Through the lower die, C', is a similar spindle, F, fitted at its upper end with a head, F', corresponding to the foot E<sup>3</sup> of the other spindle, (see Fig. 3,) and around the spindle is a spring, F<sup>2</sup>, the tendency of which is to force the head F' upward, the head F' standing beneath the paper, and so that the head F' and foot E<sup>3</sup> form a pair of jaws to gripe the paper within the dies, and so as to hold the tag, after it shall have been cut and punched by the dies, until the gripe of the head F' be released, which is done at the proper time, as hereinafter described.

The cord-introducing device is shown in enlarged view, Fig. 3. This consists of a bent tube, a, arranged upon a carriage, a', to which a reciprocating movement is imparted by means of a grooved cam, a<sup>2</sup>, on a counter-shaft, a<sup>3</sup>, to which revolution is given from the driving-shaft by means of bevel-gears, as seen in Figs. 1 and 2, the connection from the cam a<sup>2</sup> to the carriage a' being made by the lever a<sup>4</sup>, and so that the movement of the carriage is toward and from the die in the same line of movement as that given to the paper. The cord drawn from a spool, a<sup>5</sup>, extends through the tube a a short distance, and so that as the carriage a' is moved forward the tube a will present the protruding end of the cord directly over the hole in the tag held between the foot E<sup>3</sup> and head F'; then a slight feed or forward movement is given to the cord, as hereinafter described, to pass its end through the said hole and there be taken by a pair of fingers, b, which are also attached to and moved with the carriage. The fingers b are opened, as seen in Fig. 4, to receive the end of the cord, and are automatically closed upon the cord, as herein-

after described, and so that as the carriage  $a'$  is drawn back the fingers  $b$  will draw the ends of the cord through the tube, and the hole in the tag, doubling the cord, as seen in Fig. 5, until the requisite length to form the loop has been drawn from the spool or supply. The carriage  $a'$  then stands still, the fingers  $b$  holding the end of the cord in close proximity to the end of the tube, so that the two strands lie close together, as seen in Fig. 5. During the introduction and drawing out of the cord, as just described, a transverse carriage,  $d$ , arranged in suitable guides  $d'$ , and carrying the knot-tying device, has been moved so as to carry the said device to the left of the cord, as seen in Fig. 6, enlarged. The carriage is thus moved by means of a cam,  $d^2$ , through a lever,  $d^3$ .

The knot-tying device consists of a vertical spindle,  $e$ , terminating in a horn-shaped point,  $e'$ , as seen in Fig. 7. This spindle is provided with a toothed pinion,  $e^2$ , engaging with a stationary rack,  $e^3$ , (seen enlarged in Fig. 8,) and so that as the carriage  $d'$ , carrying the spindle  $e$ , moves to the right and left the rack and pinion cause a revolution of the said spindle  $e$ . The horn is composed of two parts, divided horizontally at the point, the lower part,  $e^4$ , arranged for vertical movement, as seen in Fig. 7, the two parts forming a pair of jaws, the lower or movable one held up in contact with the other or stationary jaw by a spring,  $e^5$ , and operated as hereinafter described.

On the carriage  $d'$ , and immediately in front of the tip of the horn, is a stationary jaw,  $f$ , and corresponding movable jaw  $f'$ , the movable jaw held up against the stationary jaw  $f$  by the spring  $f^2$ , (see Figs. 8 and 9,) their normal condition being closed. As the carriage  $d$  commences its movement to the right a bell-crank lever,  $f^3$ , hung upon the carriage, one arm of which is connected to the slide carrying the jaw  $f'$ , strikes a stationary stud,  $f^4$ , causing the movable jaw  $f'$  to be drawn down, opening the jaws, so that they pass onto the double cord near the fingers  $b$ . The lever  $f^3$  then escaping from the stud  $f^4$ , the jaw  $f'$  flies upward and grasps the double cord. At the same time a cutter,  $f^5$ , (see Fig. 9,) on the outside of the jaw  $f'$ , severs the cord near the end of the tube  $a$ ; also, at the same time a pair of fingers,  $h$   $h'$ , grasp the tag at the right-hand side. These fingers  $h$   $h'$  are, in connection with a carriage,  $h^2$ , moved by a cam,  $h^3$ , in a line parallel and simultaneous with the carriage  $d$ , and so that the tag, with the cord in the grasp of the jaws  $f$   $f'$ , will be moved to the right, and in this movement the end of the horn  $e'$  passes over the double cord, as seen in Fig. 10, side view, and Fig. 11, top view. At the same time the cord just in rear of the horn is raised by a lifter,  $l$ , as seen in Fig. 12, and so that the point of the horn passes beneath that part of the cord at the rear, the ends being still held by the jaws  $f$   $f'$ , and so as to form a loop around the tip of the horn,

as seen in Fig. 13, continuing its revolution until the point of the horn comes again in front of the jaws  $f'$ . (See Fig. 14.) At this time one arm of a bell-crank lever,  $e^6$ , strikes a stationary stud or shoulder,  $e^7$ , causing the lever to turn and draw down the lower part or jaw  $e^4$  of the horn. Then, as the revolution of the horn continues, the open end passes onto the cord at the jaws  $f$ , (see Fig. 15,) and the lever  $e^6$ , escaping from the shoulder  $e^7$ , permits the horn to close upon the cord near the ends with sufficient force that by the continued revolution of the horn the ends of the cord will be drawn from the jaws  $f'$ , and the loop which has been formed around the horn in its revolution will slip from its point onto the cord itself, as seen in Fig. 16, and complete the knot.

During the formation of the loop by the rotation of the horn the tag is brought forward to give sufficient slack to the cord to form the loop. In order to give this forward movement, the fingers  $h$   $h'$  are arranged upon a slide,  $h^4$ , (see Fig. 17,) at right angles to the carriage  $h^2$ , and so as to move with the said carriage  $h^2$ ; the slide  $h^4$  is moved by a cam,  $h^5$ , through a bell-crank lever,  $h^6$ , (see Fig. 1,) and as soon as the knot is tied, as before described, the cam  $h^5$  moves the fingers backward, drawing the ends of the tied cord or loop from the grasp of the horn. The fingers  $h$   $h'$  are then opened, and the tag, with its loop complete, is dropped onto a carrier or endless band,  $L$ , which carries it from the machine, or it may be otherwise delivered. The fingers  $h$   $h'$  stand open by the force of a spring, (not shown,) but as they advance to take the tag a cam,  $h^7$ , hinged in the tail of the upper finger, comes in contact with a stationary stud,  $h^8$ , which causes the cam  $h^7$  to press upon the tail of the finger  $h'$ , and so as to close the fingers upon the tag; then on their return, and in the final movement, the cam  $h^7$  is tripped by coming in contact with a stationary shoulder,  $h^9$ , as seen in Fig. 18.

When the fingers take the tag, in order to release the grasp of the head  $F$  upon it, the spindle  $F$  is drawn down by means of the cam  $F^3$  striking an arm,  $F^4$ , extending from the rock-shaft  $F^5$ , and from which an arm,  $F^6$ , extends inward into connection with the spindle  $F$ , so that the spindle  $F$  will be drawn down, as seen in broken lines, Fig. 3.

The feed of the cord before mentioned, and which causes its end to pass through the hole in the tag, is shown in Fig. 19. This consists of a slide,  $a^6$ , serrated or roughened upon its under side so as to extend into the tube and bear upon the cord.

On the carriage  $a'$  is a rock-shaft,  $a^7$ , with an arm,  $a^8$ , extending downward, (see Fig. 19,) and which, at the extreme rear movement of the carriage  $a'$ , strikes a stud,  $a^9$ , turning the shaft outward. An arm,  $a^{10}$ , extends upward and strikes a stud,  $a^{11}$ , on the slide  $a^6$ , throwing it back to its extreme point. Then, when the

carriage *a'* is again moved forward, the arm *a<sup>8</sup>* strikes another shoulder, *a<sup>12</sup>*, turning the shaft in the opposite direction. Then the arm *a<sup>10</sup>* strikes another stud, *a<sup>13</sup>*, forcing the slide forward and giving to the cord a corresponding advanced movement sufficient to pass the end through the hole in the tag, as before mentioned. The fingers *b* are opened and closed by means of the said rock-shaft *a<sup>7</sup>*, as seen in Fig. 4. The fingers are attached, respectively, to a slide, *b<sup>2</sup>*, one above the other. From the slide *b'* a stud, *b<sup>3</sup>*, extends upward, and from the other slide, *b<sup>2</sup>*, a like stud, *b<sup>4</sup>*, extends upward through a plate, *b<sup>5</sup>*. This plate *b<sup>5</sup>* has a reciprocating movement imparted to it by means of a cam, *b<sup>6</sup>*, on the rock-shaft *a<sup>7</sup>*, and in the plate there are two converging slots, *b<sup>7</sup>* and *b<sup>8</sup>*, through which the studs *b<sup>3</sup>* and *b<sup>4</sup>* extend, and so that when the plate *b<sup>5</sup>* is moved forward the said inclined slots force the fingers together to grasp the cord, and on the return of the carriage *a'* the movement of the rock-shaft *a<sup>7</sup>* draws the slide outward and opens the fingers to release the end of the cord when it has been taken by the jaws *f f'*. The devices for imparting the movement to the parts may be changed, and other known mechanism for producing the same movement may be substituted.

The lifter *l* is raised, as before described, by means of a bell-crank lever, *l'*, hung upon the carriage *d*, one arm of which operates against a stud, *l<sup>2</sup>*, on the lifter, and the other arm strikes a stationary lug, *l<sup>3</sup>*, as seen in Fig 8<sup>a</sup>, and rides on the lug during the time the lifter is raised, then passes off from the lug, permitting the lifter to drop, and as the carriage returns the bell-crank lever *l'* passes over the lug *l<sup>3</sup>* without effect upon the lifter. A spring, *l<sup>4</sup>*, acts upon the bell-crank lever *l'*, tending to hold it in its normal condition, yield to its movement in either direction because of its contact with the lug *l<sup>3</sup>*, and return it to its normal condition when it escapes from the said lug.

It will be understood that the usual methods of adjustment of parts in other machines are or may be employed in this machine to adapt it to various sizes and shapes of tags.

The tags may be cut in another machine and successively presented to the holding device by hand or otherwise. In that case the cutting-dies and feed would be dispensed with.

I claim—

1. The combination of a feeding device to deliver the paper, dies to cut and punch the tags, with the foot *E<sup>3</sup>* and head *F<sup>7</sup>*, to hold the tag after the dies have separated, and the fingers *h h'*, to take the tag from between the head and foot, substantially as described.

2. The combination of dies to cut and punch

the tags, fingers *h h'*, to take the tag, with mechanism, substantially such as described, to present and introduce the cord through the hole in the tag, grasp the end of the cord and draw it through, and cutter and jaws *f f'*, to take the end of the cord, the said jaws *f f'* and the fingers *h h'* moving together away from the dies which cut the tag, substantially as described.

3. The combination of dies to cut and punch the tags, fingers *h h'*, to take the tag, with mechanism, substantially such as described, to present and introduce the cord through the hole in the tag, grasp the end of the cord and draw it through, and cutter and jaws *f f'*, to take the end of the cord, and the revolving horn *e'*, moving with the said jaws *f f'*, and the said fingers advanced to give sufficient slack for the horn to form the loop and knot, substantially as described.

4. The combination of dies for cutting the tag, mechanism, substantially such as described, to present and introduce the cord through the hole in the tag, and mechanism, substantially such as described, to take the two ends of the cord and form a knot, substantially in the manner specified.

5. The combination of mechanism, substantially such as described, for holding the tag, the reciprocating tube *a*, fingers *b*, cutter *f<sup>5</sup>*, divided revolving horn *e'*, the two parts of the horn arranged to separate and close upon the ends of the cord after it has formed the loop for the knot, and the jaws *f f'*, substantially as described.

6. The combination of mechanism, substantially such as described, for holding the tag, with the reciprocating tube *a* and fingers *b*, jaws *f f'*, and cutter *f<sup>5</sup>*, substantially as described.

7. The combination of mechanism, substantially such as described, for holding the tag, reciprocating tube *a*, and fingers *b*, with the feed *a<sup>6</sup>* to advance the cord, substantially as described.

8. The combination of mechanism, substantially such as described, for holding the tag, reciprocating tube *a*, jaws *f f'*, revolving horn *e'*, and lifter *l*, substantially as described.

9. The combination of mechanism, substantially such as described, for holding the tag, reciprocating tube *a*, and fingers *b*, with the feed *a<sup>6</sup>*, to advance the cord, substantially as described.

10. The combination of the feed-rolls, the punch and die, and the laterally-moving tag-carrier, all substantially as described.

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