

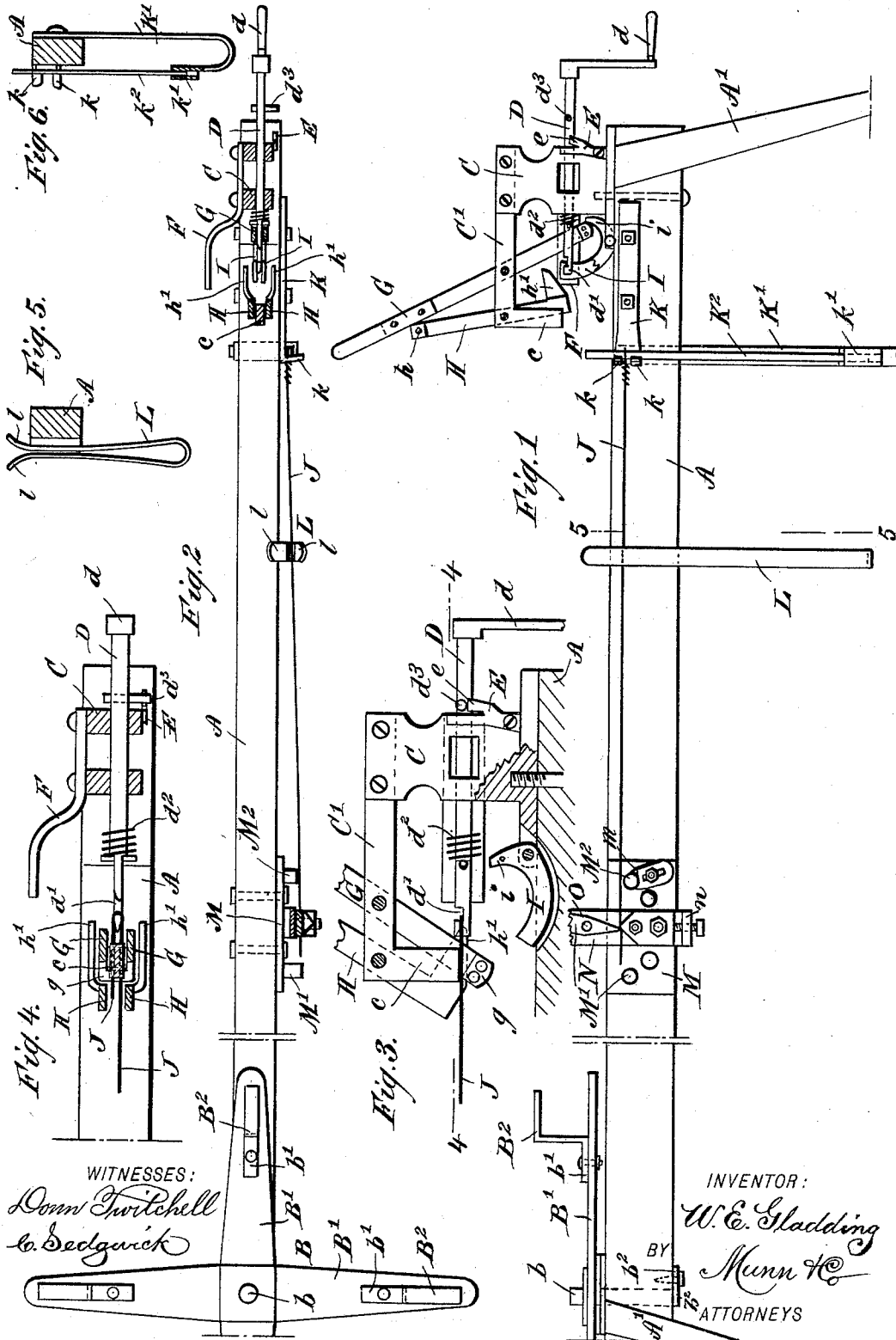
(No Model.)

2 Sheets—Sheet 1.

W. E. GLADDING.
BALE TIE MACHINE.

No. 465,758.

Patented Dec. 22, 1891.



WITNESSES:

Donn Twitchell
C. Sedgwick

INVENTOR:

W. E. Gladding
Munn & Co
ATTORNEYS

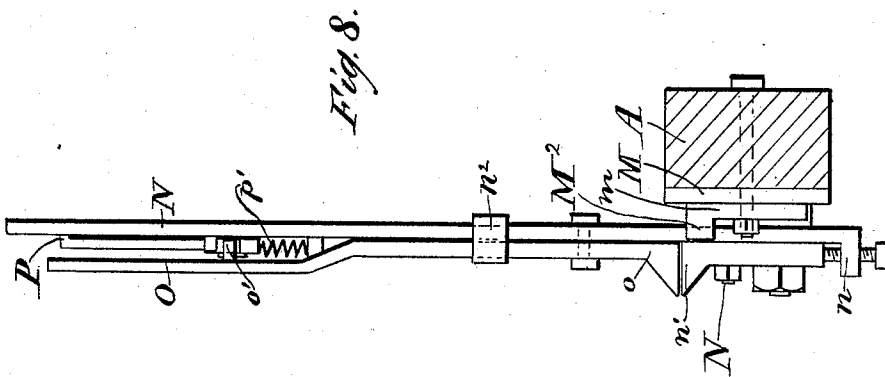
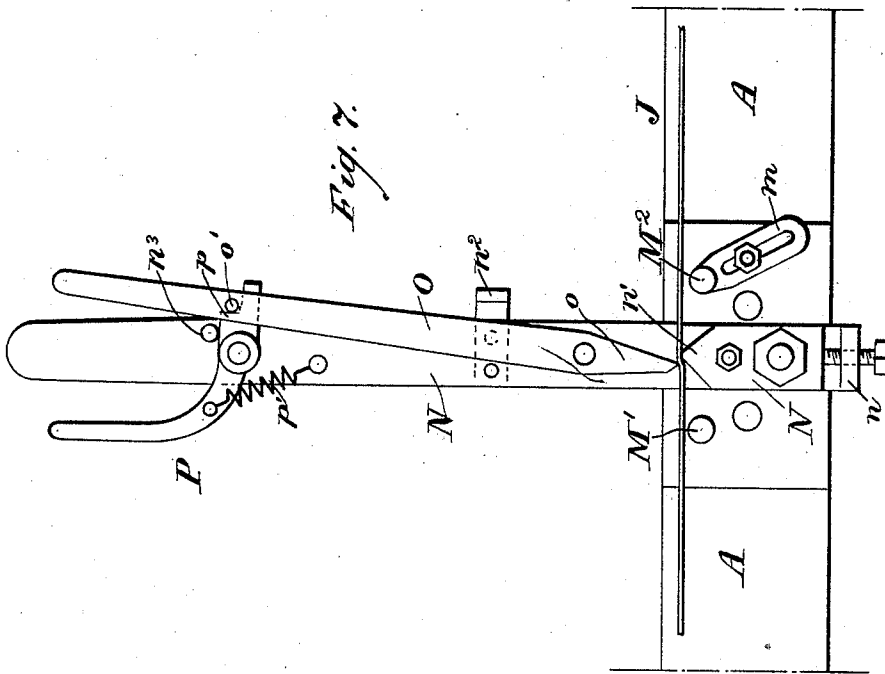
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UNITED STATES PATENT OFFICE

WILBER E. GLADDING, OF RANTOUL, KANSAS.

BALE-TIE MACHINE.

SPECIFICATION forming part of Letters Patent No. 465,758, dated December 22, 1891.

Application filed February 26, 1891. Serial No. 332,868. (No model.)

To all whom it may concern:

Be it known that I, WILBER E. GLADDING, of Rantoul, in the county of Franklin and State of Kansas, have invented a new and Improved Bale-Tie Machine, of which the following is a full, clear, and exact description.

My invention relates to improvements in machines for making bale-ties of wire; and the object of my invention is to produce a durable and efficient machine by means of which the ties may be rapidly and nicely formed, and also to provide means for straightening the wire.

To this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a broken side elevation of the entire machine. Fig. 2 is a broken plan view of the same with the loop-forming mechanism shown in section. Fig. 3 is a broken enlarged detail view, partly in section, of the loop-forming mechanism. Fig. 4 is a horizontal section of the same on the line 4 4 in Fig. 3. Fig. 5 is a vertical section on the line 5 5 in Fig. 1, showing one of the wire-holding loops or frames. Fig. 6 is a vertical cross-section showing another of the wire-holding loops and the means for holding the ties when they are to be stretched. Fig. 7 is an enlarged side elevation of the stretching and cutting levers; and Fig. 8 is an edge view of the same, showing the main frame or bar in section.

The bar A and the legs A' at each end constitute the main frame of the machine, and mounted on the upper side of the frame at one end is a reel B, which reel consists of the main cross-arms B', which are halved together and mounted on the arbor b and the angle-irons B², which are secured to the arms near their outer ends, and which form keepers to carry the wire, the said angle-irons having a flange b', by means of which they are secured to the cross-arms. The arbor b extends vertically through the main bar or frame A, and is formed into a flange b³ at the lower end, which flange is screwed to the bar A on the

under side. On the opposite end of the main bar A and on the upper side is a head-stock C, from one side of which extends an arm C', which is parallel with the main bar A and which at the end is bent downward at right angles, so that the end portion c will be perpendicular to the bar and afford means for holding the wire to form the tie in a manner hereinafter described.

A revoluble and longitudinally-movable shaft D is mounted centrally in the head-stock C, so as to align with the arm C' and with the bar A, and said shaft has its outer end provided with a crank-handle d and its inner end flattened and provided on one side with a notch d', which notch serves to hold the wire while the loop is being formed. The shaft D is provided with a spiral spring d², which encircles it, and is held in place by a stud, and which presses it back, so that the spring-arms I will strike the wire when a loop is formed, and near the outer end of the shaft is a projecting stud d³, which when the shaft is turned will strike the spring-plate E and will enable the operator to count the revolutions of the shaft. The plate E is secured to the lower end of the head-stock C, and is provided with a projecting arm e, which extends into the path of the stud d³.

On the back side of the head-stock C is a horizontal arm F, which is bent outward, and which near its free end is made to extend parallel with the shaft D, and the arm thus serves as a stop, against which one end of the wire is placed when a loop is to be formed.

A split lever G is pivoted centrally on the arm C', the two members of the lever embracing the arm, and the members of the lever are united at the lower end, as shown at g, and this part g is adapted to impinge on and hold a wire against the lower end c of the arm C', as shown in Fig. 3. The lever G is placed in relation to the shaft D, so that when the lever is swung forward the shaft D will extend through the split portion of the lever, as shown in Fig. 1. A pair of spring-arms H are pivoted on opposite sides of the arm C' near the forward end of the same, the arms being shorter than the lever G and being united at the top, as shown at h, which upper end is directly in the path of the lever G, so that

when the lever is swung forward it will strike the upper ends of the arms and tilt them, as shown in Fig. 1, and the lower ends of the arms extend a little below the bent end *c* of the arm *C'* and terminate in feet *h'*, which feet are bent outward and extend rearward and are inclined on the under side, so as to form a continuous guide for the wire, in a manner which will be described when the operation of the machine is explained.

A pair of bent spring-arms *I*, which are capable of springing apart slightly at their rear ends, are pivoted in a slot on the front of the base of the head-stock *C*, so as to lie normally in a recess *a* in the top of the bar *A*, and the arms align vertically with the shaft *D* and the arm *C'*. The rear ends of the arms are united, as shown at *i*, and these rear ends extend upward into the path of the lever *G*, so that when the lever is swung forward it will strike the arms and raise them, as shown in Fig. 1, and the arms are slightly separated at their extreme front ends, so that when raised they will embrace the front end of the shaft *D* and force the loop of the wire *J* from the shaft after the loop has been formed.

A plate *K* is secured to the bar *A* on one side and adjacent to the loop-forming mechanism described above, said plate having at one end parallel laterally-extending prongs *k*, the space between which will hold a certain number of wires, so that by filling the space and then removing the wires it will be known how many ties have been made without the trouble of counting them. One arm of a U-shaped frame *K'* is secured to the bar *A* opposite the prongs *k* and on the back side of the bar, and said frame extends beneath the bar *A*, and its short arm terminates in a keeper *k'*, in which is secured a spring-rod *K²*, which extends upward over the plate *K* and presses against the prongs *k*, and the rod *K²* thus forms a support for the wire while it is being stretched, as described below. It will thus be seen that the U-shaped frame *K'* and the spring-rod secured thereto form a loop or support for the ties, and that the spring-rod also forms a support for the loops in the tie, so that the loops may be placed over the rod, and the wire ties may be made to extend between the prongs *k*, as best shown in Fig. 1.

In the rear of the above-described loop or frame is another loop *L*, one arm of which is also secured to the bar *A*, and the loop is of a U shape, and its ends *l* diverge, as best shown in Fig. 5, so that the ties may be easily dropped into the loop.

The following mechanism is employed for straightening and stretching the wires of which the ties are formed and for cutting off the wire: A plate *M* is secured to the bar *A*, and near opposite ends of the plate are studs *M'* and *M²*, the stud *M'* being fixed and the stud *M²* being adjusted by means of a slotted plate *m*, to which it is secured, and which plate is held by a bolt to the plate *M*, and pivoted on the plate *M* between these studs and

a little below the same is an upwardly-extending lever *N*, which lever is bent outward to form a flange *n* at its pivoted end, in which is a set-screw to adjust the cutting-plate, and adjustably secured to the lever near its pivoted end is the cutting-plate *N'*, the upper part of which is formed into a dull edge *n'*. The lever *N* is also provided with a bent arm *n²* to support the cutting-lever *O* and with a stud *n³*, arranged above the cutting-lever and adapted to limit the movement of the lever *O*. The movement of the lever *N* is limited by the studs *M'* and *M²*. The cutting-lever *O* is pivoted on the main lever *N* at a point adjacent to the cutting-plate *N'*, and the cutting-lever *O* is formed at its pivoted end *o* into a cutting-edge, which edge is adapted to be brought opposite the edge of the cutting-plate *N'*, so that when the two edges are brought against a wire, which is held between them, the wire can be severed. The movement of the lever *O* is regulated by means of a latch *P*, which latch is pivoted on the lever *N* near its free end, and is provided near the lower end with a shoulder *p*, which is adapted to engage a projecting stud *o'* on the inner side of the cutting-lever *O*, and thus limit the movement of the lever. The latch *P* is held normally so that the shoulder *p* will engage the stud *o'* by a spiral spring *p'*, one end of which is secured to the latch and the opposite end to the stud *n³* on the lever *N*.

The operation of the machine is as follows: The wire *J* is unwound from the reel, the lever *G* is thrown forward, as shown in Fig. 1, and the wire is inserted in the notch *d'* of the shaft *D* with the end of the wire pressing against the stop *F*. The lever *G* is then swung backward with one hand while the wire is held in position with the other, and the lever thus doubles the wire around the front end of the shaft *D*, forming a loop and carrying the end of the wire forward, as best shown in Fig. 4. As the lower end of the lever advances it swings the arms *H* forward and the inclined feet *h'* serve as guides, as they will continually press downward upon the wire and prevent it from being released from the notch in the shaft *D*. When the wire has been doubled, as shown in Fig. 4, to form a loop in the end, the lower end of the lever *G* will advance still farther, and the solid portion *g* of the lever at its lower end will impinge upon the wire and hold it against the bent end *c* of the arm *C'*, as shown in Fig. 3. The lever is held in this position with one hand, thus preventing the removal of the loop, and with the other hand the operator turns the handle *d* and the shaft *D*, thus twisting the two members of the wire together, so that the loop will become permanent. As a rule, it is necessary to turn the shaft about four times, and as the shaft is revolved the stud *d³* will strike the arm *e* of the plate *E*, so that the operator may count the strokes and tell when to stop turning the shaft. After the loop is formed, the lever *G* is swung forward, as shown in Fig. 1,

and this swings the lower end of the lever rearward, which movement raises the spring-arms I, and the front ends of the arms will be raised against opposite sides of the shaft D, thus pushing the loop of the wire from the shaft and allowing it to be removed. The loop of the wire is then placed upon the spring-rod K², the main portion of the wire extending between the prongs k of the plate K, as shown in Fig. 1, and the opposite end of the wire is inserted between the end o of the cutting-lever O and the edge of the cutting-plate N'. The lever O is then swung until it engages the shoulder of the latch P, and this will cause the cutting-edge of the lever to be embedded in the wire far enough to hold the same securely, but not far enough to cut it off. The main lever N, with the lever O thereon, is then swung forward, thus stretching the wire and making it absolutely straight. When the wire is stretched sufficiently, the latch P is pulled back, so as to release the cutting-lever O, and the lever is then forced against the stud n³, which movement brings the cutting-edges of the lever opposite the edge of the cutting-plate, and the wire is severed.

The cutting-off device is placed upon the bar A in relation to the spring-rod K², so that when the wire is cut the tie will be of the desired length, and the position of the cutting-off device may be changed according as the ties to be cut are to be longer or shorter.

When the ties have been straightened and cut until the space between the prongs k is filled, the rod K² is swung away from the prongs and the ties are allowed to drop, the loops being carried down on the rod K², and the bodies of the ties being supported in the loop L.

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

1. In a bale-tie machine, the combination, with a main frame, of a head-stock thereon having a bent arm extending above the machine-frame, a revoluble and longitudinally-movable shaft mounted in the head-stock and provided with a notch at one end, a split lever pivoted on the arm of the head-stock and adapted to swing over the shaft, and a pair of spring-arms pivoted in front of the lever and provided at their lower ends with inclined guide-feet, substantially as described.

2. In a bale-tie machine, the combination, with a main frame, of a head-stock thereon having a bent arm extending above the machine-frame, a revoluble and longitudinally-movable shaft mounted in the head-stock and provided with a notch at one end, a split lever pivoted on the arm of the head-stock and adapted to swing over the shaft, a pair of spring-arms pivoted in front of the lever and provided at their lower ends with inclined guide-feet, and a stop secured to the head-stock and arranged to extend opposite the notched end of the shaft, substantially as described.

3. In a bale-tie machine, the combination, with a main frame, of a head-stock thereon having a bent arm extending above the machine-frame, a revoluble and longitudinally-movable shaft mounted in the head-stock and provided with a notch at one end, a split lever pivoted on the arm of the head-stock and adapted to swing over the shaft, a pair of spring-arms pivoted in front of the lever and provided at their lower ends with inclined feet, and bent arms pivoted beneath the shaft and in the path of the lever, said arms having their front ends adapted to embrace the loop-shaft, substantially as described.

4. In a bale-tie machine, a loop-forming device comprising a head-stock, an arm secured to the head-stock and extending parallel with the main frame, said arm having a downwardly-bent end, a revoluble and longitudinally-movable loop-shaft mounted in the head-stock beneath the arm and provided with a notch in its front end, a split lever pivoted on the arm and having its lower end arranged to impinge on the bent end of the arm, a pair of spring-arms pivoted in front of the lever and provided at their lower ends with inclined guide-feet adapted to extend opposite the notched end of the loop-shaft, and a pair of spring-arms pivoted beneath the loop-shaft and in the path of the lever, said arms having one end adapted to embrace the loop-shaft, substantially as described.

5. In a bale-tie machine, the combination, with the revoluble and longitudinally-movable loop-shaft, and the split lever pivoted above the shaft and adapted to move upon it, of spring-arms pivoted beneath the loop-shaft, said arms having their rear ends bent to extend into the path of the lever and their forward ends adapted to embrace the loop-shaft, substantially as described.

6. In a bale-tie machine, the combination, with a plate having laterally-extending prongs, and a spring-rod held against the prongs and adapted to receive a tie-loop, of a stretching device secured to the main frame and adapted to be clamped to a tie, substantially as described.

7. In a bale-tie machine, the combination, with a holder, of a cutting and stretching mechanism comprising a pivoted main lever provided with a cutting-plate, a cutting-lever pivoted to the main lever, and a latch for regulating the movement of the cutting-lever, carried by the main lever, substantially as and for the purpose set forth.

8. The combination, with the main lever having a cutting-plate thereon, of a cutting-lever pivoted on the main lever and having a cutting-edge, as described, and having a projecting stud near its free end, and a spring-pressed latch pivoted on the main lever and provided with a shoulder to engage the stud of the cutting-lever, substantially as described.

9. In a bale-tie machine, a cutting and stretching mechanism consisting of a plate provided with projecting studs, one of which

is adjustable, a main lever pivoted to the plate, a cutting-plate adjustably secured to the lever, a cutting-lever pivoted to the main lever and provided with a laterally-projecting stud, and a pivoted and spring-pressed latch carried by the main lever and provided with a shoulder against which the stud of the cutting-lever engages, substantially as herein shown and described.

WILBER E. GLADDING.

Witnesses:

C. B. MASON,

GEO. D. STINEBAUGH.