May 20, 1924. 1,495,072

A. J. GERRARD ET AL

WIRE TYING MACHINE

Filed Dec. 30, 1921

Fig. 1.

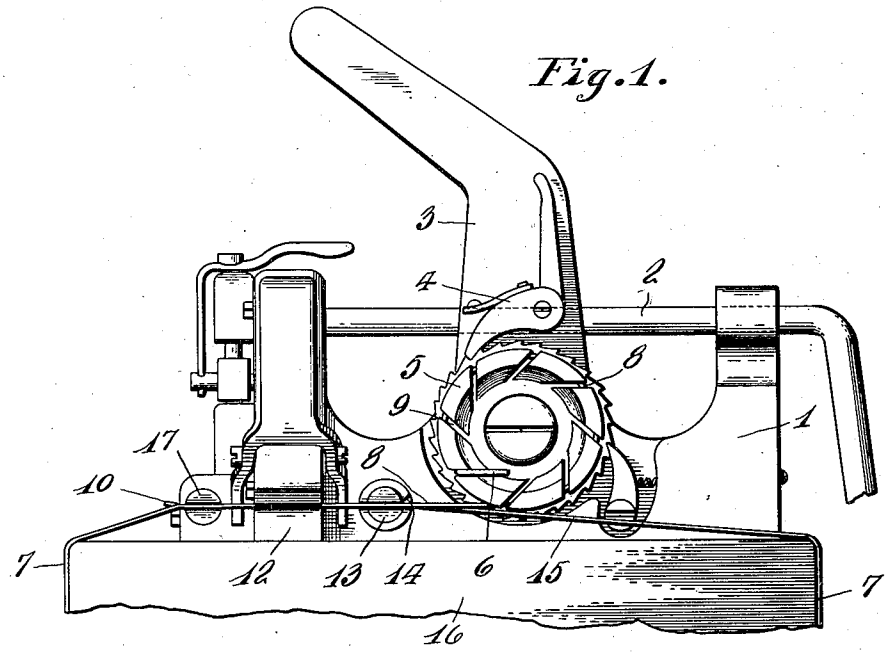


Fig. 1a.

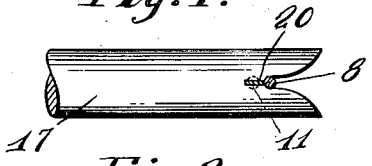


Fig. 1b.

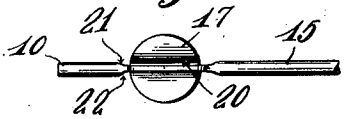


Fig. 2.

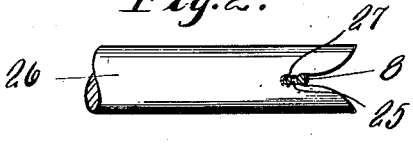


Fig. 1c.

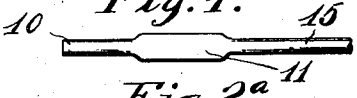


Fig. 2a.

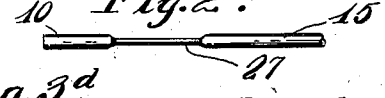


Fig. 3.

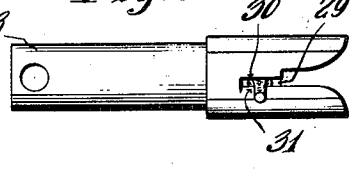


Fig. 3d.



Fig. 3a.

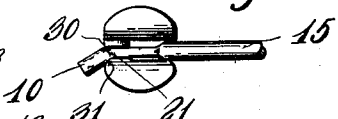


Fig. 3b.

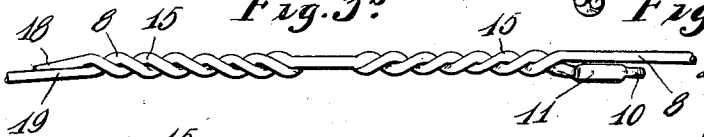
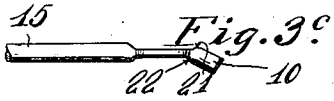


Fig. 3e.

Fig. 3c.



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Attorney

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UNITED STATES PATENT OFFICE.

ALEC J. GERRARD AND PARVIN WRIGHT, OF CHICAGO, ILLINOIS.

WIRE-TYING MACHINE.

Application filed December 30, 1921. Serial No. 525,903.

To all whom it may concern:

Be it known that we, ALEC J. GERRARD and PARVIN WRIGHT, respectively a subject of the King of Great Britain and a citizen of the United States, both residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Wire-Tying Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to wire tying machines provided with means especially adapted to hold the deformed ends of tie wires against the strains brought on them by the tensioning and twisting actions of said machines, and has for its object to provide a holding means which will be simple in construction, efficient in action, and comparatively inexpensive to manufacture.

With these and other objects in view, the invention consists in the novel details of construction and combinations of parts more fully hereinafter described and particularly pointed out in the claims.

In our copending applications #371,368, filed April 5, 1920, for wire twisting machine, and #418,634, filed October 22, 1920, entitled wire tensioning and twisting machine, we have illustrated two forms of mechanism for tensioning, twisting, and cutting the wire during the operation of banding boxes, and in the present application we illustrate in Figure 1 a form of mechanism which is or may be identical with that illustrated in our said last mentioned application #418,634.

This said present application is further directed to subject matter disclosed but not claimed in said prior applications.

Referring to the accompanying drawings forming a part of this specification, in which like numerals designate like parts in all the views:

Figure 1 is a diagrammatic view of a machine illustrated in our said prior application #418,634, and suitable for tensioning, twisting and cutting parallel bights of wire;

Figure 1^a is a fragmentary side view of a portion of the holding post for the parallel bights of wire to be twisted;

Figure 1^b is an end view of the parts shown in Figure 1^a;

Figure 1^c is a view of the end portion of the wire used in the preceding figures;

Figure 2 is a view similar to Figure 1^a, but of a slightly modified form;

Figure 2^a is a view of the end portion of the particular wire adapted for use in Figure 2;

Figure 3 is a view similar to Figure 1^a, of a further modified form of holding post;

Figure 3^a is an end view of the parts shown in Figure 3;

Figure 3^b is a view of the knot tied by the machine illustrated in Figure 1;

Figure 3^c is an end view of the wire employed in the post of Figure 3 after the knot is tied;

Figure 3^d is an end view of the knot when seen from the right in Figure 3^b; and

Figure 3^e is an end view of the knot when seen from the left in Figure 3^b.

1 indicates any suitable wire tying machine such for example as that illustrated in our copending application #418634 and now well known on the market in this country, which machine is preferably provided with the power shaft 2, and lever 3, adapted through the pawl 4 to turn the tensioning means 5, which receives one extreme end 6 of a wire 7, whose bight 8 wraps around the member 5 and whose end 6 is placed in one of the notches 9, in order to secure the same when said member or ratchet 5 is turned, all as will be clear from our last mentioned copending application, above. The other end 10 of the wire is deformed as at 11, see Figures 1^b and 1^c, it passes through the twisting mechanism 12 of the machine through one of the holding posts 13 past the cutter 14 to form the bight 15 which wraps around the package 16 and comes up through the holding post 17 to form the bight 8 above mentioned.

As is well known, it is very essential in these machines to securely hold each end of the wire during the tensioning and twisting operations and also to prevent the extreme ends of the knot when tied from projecting up above the surface of the knot, because these wires being made of mild steel, should they so project above the surface of the knot they would rip open or tear other packages which are moved over them during shipment or storage. The rotary cutter 14 when it severs the knot 18 of the bight 15, see Figure 3^b, naturally pushes the extreme end 18

down so that it becomes tucked down against the body portion 19 of the bight 8, and thus is so tucked away that it does not injure boxes that are slid thereover.

In the form of holding post illustrated in Figures 1^a, and 2, there is no means provided by which the other end 10 of the knot is tucked down beneath or alongside of the accompanying bight 8, but a provision for properly tucking down the end 10 of the knot is illustrated in Figure 3, as will be presently disclosed.

Coming, however, to the form of holding post illustrated in Figure 1^a, it is provided with a narrow slit 20 of such dimensions as will receive the flattened portion 11 of the extreme end 10 of the bight 15, and the shoulders 21 and 22 of said end 10 take against the edges of the slit 20, and thus hold the end 10 of the bight 15 firmly in place. After the bight 15 has been passed through the twisting mechanism 12, through the holding post 13, beneath the cutter 14, around the box, the wire is then passed again through the post 17, forming the bight 8 which lies alongside of and parallel to the bight 15, passed through the twisting mechanism 12, through the holding post 8, and around the tensioning ratchet 5, all as will be clear from Figures 1 and 1^a.

After the twisting operation is completed, by turning the power shaft 2, the wire is twisted into the knot illustrated in Figure 3^b, and the cutter 14 is turned in a clockwise direction as seen in Figure 1, and the bight 8 is then severed, which turns down the end 18 as stated above and as illustrated in Figure 3^b.

In the somewhat modified form of the invention illustrated in Figures 2 and 2^a, the slot 25 of the post 26 is made somewhat larger than is the slit 20, and the end 10 of the wire instead of being deformed into the flat portion 11 is deformed into the rounded portion 27. Otherwise the construction and arrangement of parts is the same as that in Figures 1^a and 1^b.

Coming now to the still further modified form of the invention illustrated in Figures 3, 3^a, 3^b, etc., the holding post 28 is provided with a narrow slot or slit 29, one edge 30 of which is of the same construction as is the corresponding edge in the preceding posts 17 and 26. The other edge 31, however, of said slit 29 is cut away, as will be clear from Figures 3 and 3^a, so that when tension is brought on the extreme end 10 of the bight 15, the edge 30 of the slit 29 will exert such a strain on the shoulder 21 of the end 10, see Figures 1^b and 3^a, that said shoulder will be considerably deformed or smoothed out, as illustrated in Figures 3^a, and 3^c, while the opposite shoulder 22 will be bent under owing to the fact that the edge 31 of the slot 29 has been cut away. The results constitute an important feature of this invention, because the extreme end 10 of the bight 15 is bent down into the positions shown in Figures 3, 3^a and 3^c.

In other words, as will be more clear from Figures 3^b, 3^d, and 3^e, the extreme end 10 of the bight 15 when held in the form of holding post illustrated in Figure 3, is bent down alongside the bight 8 of the knot, at one end of said knot, while the cutter 14 bends the other end 18 of said knot down alongside the bight 19, and thus neither end of the wire projects up above the body portion of the knot to tear packages which may be slipped over the knot during storage or shipment.

It is obvious that those skilled in the art may vary the details of construction as well as the arrangements of parts without departing from the spirit of the invention, and therefore we do not wish to be limited to the above disclosure except as may be required by the claims.

What is claimed is:

1. In a wire tying machine adapted to twist together two parallel disposed bights of a wire, having a deformed end, the combination of means to receive and hold said deformed end during the twisting operation; and means to cut one of said bights and bend the cut end down alongside the other bight after said twisting operation, substantially as described.

2. In a wire tying machine adapted to tension and twist together two parallel disposed bights of a wire having a deformed end, the combination of means to receive and hold and bend said deformed end during the tensioning and twisting operations; and means to cut one of said bights and bend the cut end down alongside the other bight after said twisting operation, substantially as described.

3. A holding means for wire tying machines provided with means comprising an open ended slot with one edge cut away and having dimensions adapting it to receive only a deformed portion of a tie wire and said slit adapted to hold and bend the wire during the tying operation, substantially as described.

4. A holding means for wire tying machines provided with means comprising an open ended slit with a cutaway edge, said slit having a construction and dimensions adapting it for receiving, holding, and bending a deformed portion only of a tie wire and with additional open ended means for receiving a bight of said wire, substantially as described.

5. A holding means for wire tying machines provided with means of such dimensions as to be adapted to receive only the deformed end of a tie wire and with means

adapted to hold and bend said wire during the tying operation, substantially as described.

6. A holding means for wire tying machines provided with means of dimensions adapted for holding a deformed end of a tie wire, and also means for bending said deformed end during the tying operation, and with additional means for receiving a bight of said wire, substantially as described.

7. A holding means for wire tying machines comprising a post having a slit of a width smaller than the diameter of the wire with one edge cutaway and adapted to receive, hold, and bend a deformed part of a tie wire during the tying operation, substantially as described.

8. A holding means for wire tying machines comprising a post having a slit with a beveled edge to receive, hold, and bend a deformed part of a tie wire and a slot to receive a bight of said wire, substantially as described.

9. A holding means for wire tying machines, comprising a post having a slit with a beveled edge to receive, hold and bend a shouldered deformed end of a tie wire, substantially as described.

10. In a wire tying machine the combination of means for tensioning a wire; means coacting with said tensioning means for bending a held end of said wire by the force of the tensioning operation; means for twisting together two bights of the tensioned wire; and means for severing one of said bights, substantially as described.

11. In a wire tying machine, the combination of means for holding a deformed end of a wire and bending said end when strain is brought on it; means for tensioning said wire; means for twisting together two bights of said wire; and means for severing and bending the severed end of one of said bights at the end of the twisting operation, substantially as described.

12. In a wire tying machine the combination of means for holding and bending a deformed end of the wire; means for tensioning said wire; means comprising a slotted twisting pinion for twisting together two bights of the tensioned wire; means for severing one of said bights at the end of the twisting operation; means for stopping said twisting pinion in a predetermined angular position at the end of the twisting operation; a gravity actuated latch for holding said bights in position to be twisted; and means actuated by said latch for forcibly ejecting the twisted bights from the holding means, substantially as described.

13. In a wire tying machine the combination of a holding post adapted to receive and to bend a deformed end of a wire when a strain is exerted thereon; a twisting means; an automatic cutting and bending means for the wire; and an automatic means for stopping and starting the twisting means in a predetermined position, substantially as described.

14. In a wire tying machine the combination of means for twisting two bights of a wire together while under tension; means for bending one end of said wire down alongside one of said bights; and additional means for bending the other end of said wire down alongside of the other of said bights in the finished knot, substantially as described.

15. Means for holding a wire in a wire tying machine comprising an open ended slit of a width less than the diameter of the wire to be held, said slit adapted to receive a deformed portion of said wire, and associated with means for bending the end of said wire when tension is brought thereon.

16. A holding means for a wire when used in a wire tying machine provided with means comprising a slit with one edge cutaway, said slit being of a less width than the diameter of the wire to be held and adapted to receive the deformed end of said wire and to bend said end when said wire is tensioned, and also provided with means of a width as great as the diameter of said wire and adapted to receive a full sized bight thereof.

17. A holding means for a wire when used in a wire tying machine, provided with means of dimensions sufficient to receive and hold a deformed end of said wire, but insufficient to receive the full sized wire; and also provided with means to bend the end of said wire when a tension is exerted thereon.

In testimony whereof we affix our signatures.

ALEC J. GERRARD.
PARVIN WRIGHT.