May 22, 1923. 1,455,953

P. WRIGHT

MACHINE FOR CAPPING BUNDLES OF TIE WIRES

Filed Dec. 30, 1921 3 Sheets-Sheet 1

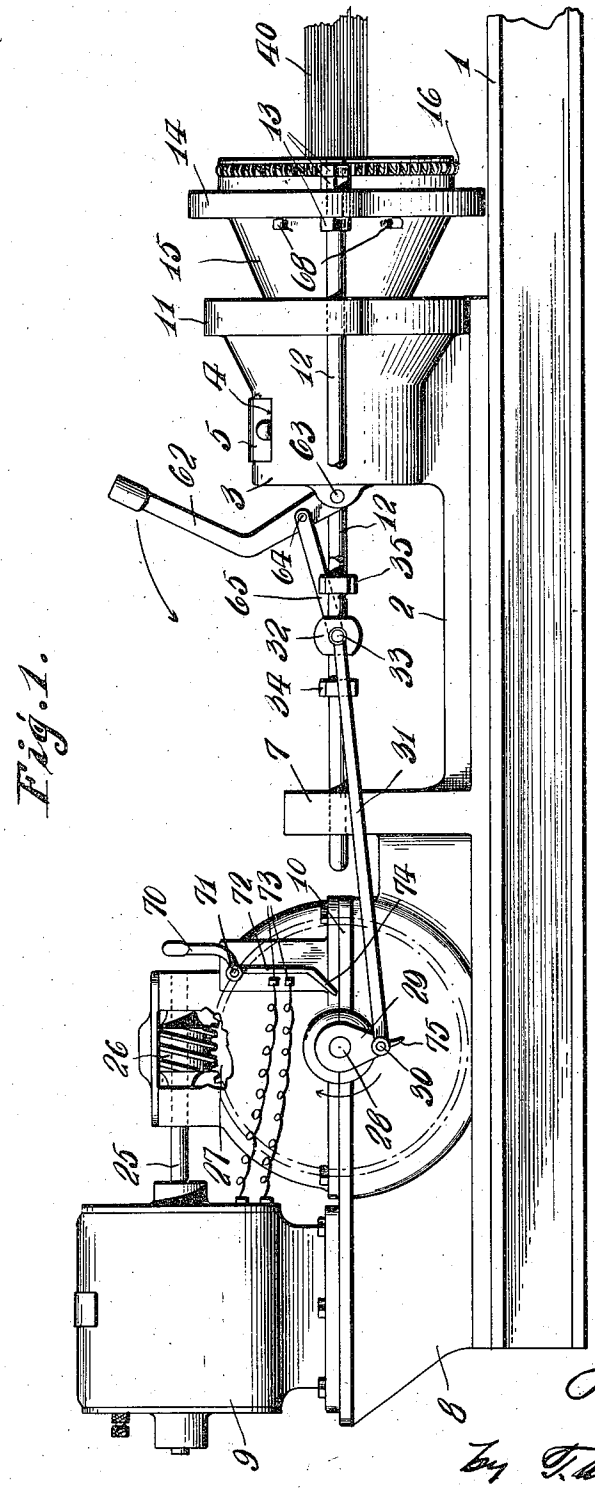



Fig. 1.

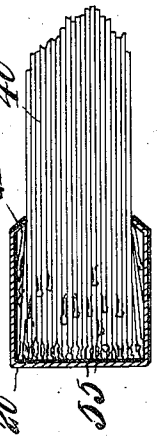



Fig. 4.

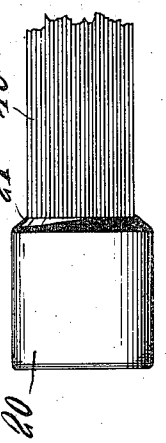



Fig. 3.

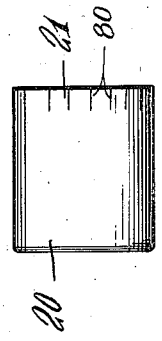



Fig. 2.

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May 22, 1923. 1,455,953

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MACHINE FOR CAPPING BUNDLES OF TIE WIRES

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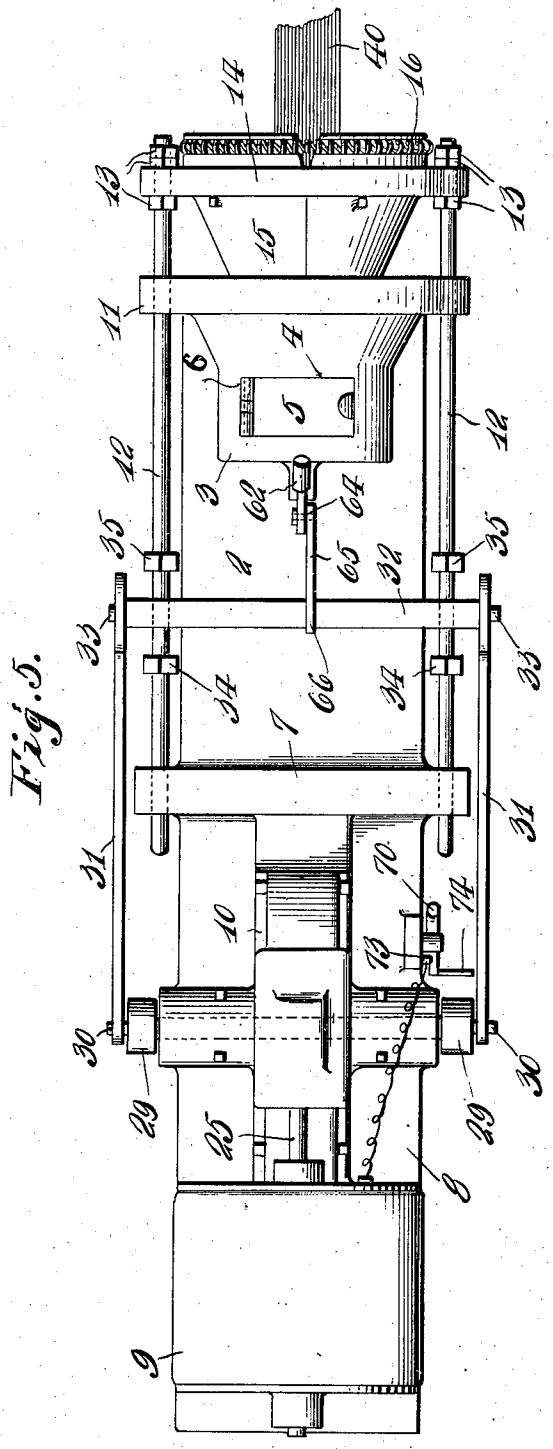


Fig. 5.

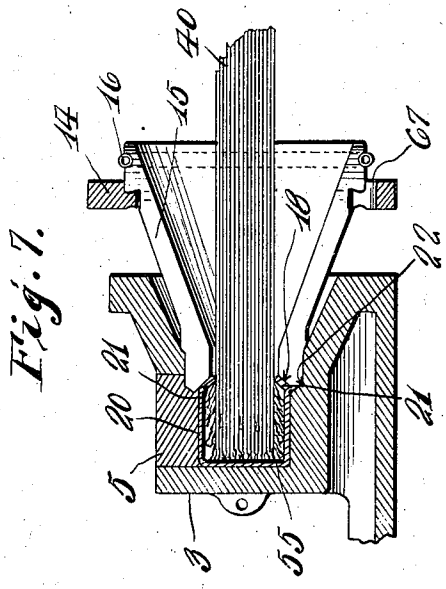


Fig. 7.

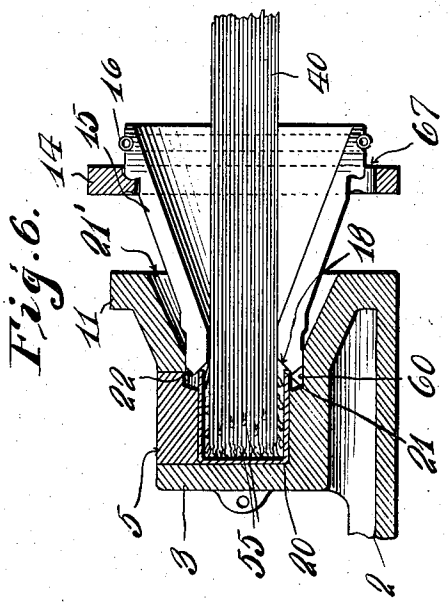


Fig. 6.

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MACHINE FOR CAPPING BUNDLES OF TIE WIRES

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Fig. 8.

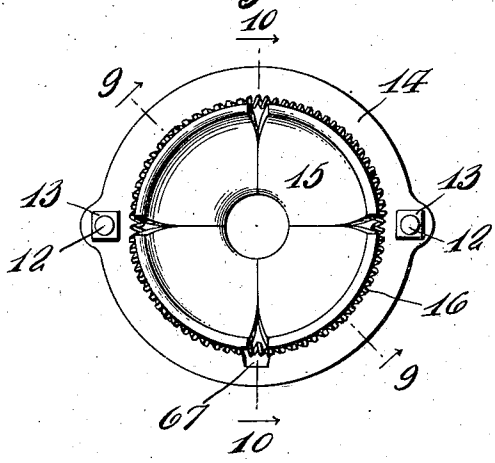



Fig. 9.

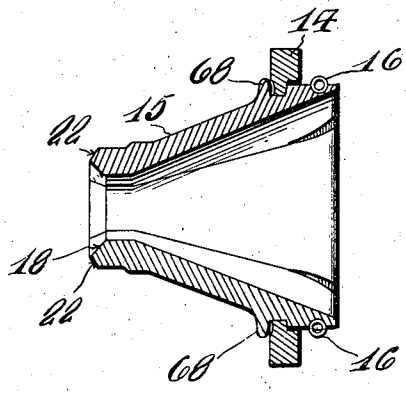



Fig. 10.

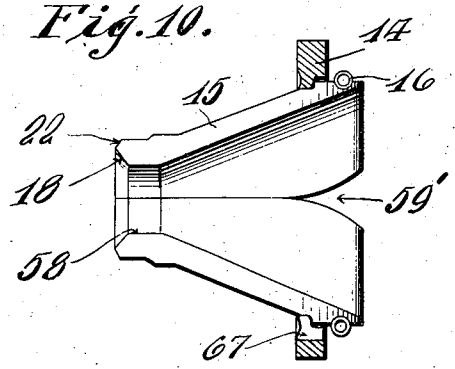



Fig. 11.

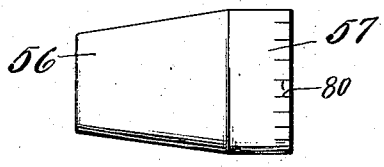
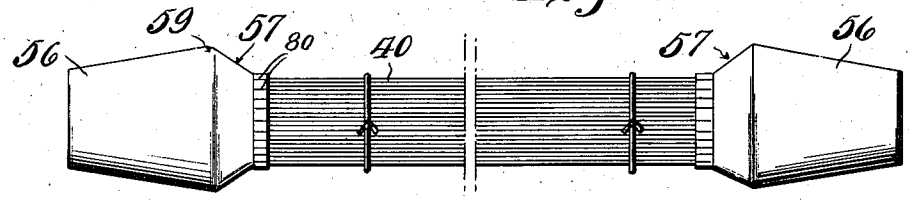



Fig. 12.



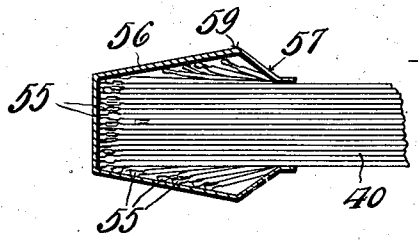




Fig. 13.

Inventor

Darwin Wright by

T. A. Wilkinson

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Patented May 22, 1923. 1,455,953

# UNITED STATES PATENT OFFICE.

PARVIN WRIGHT, OF CHICAGO, ILLINOIS.

## MACHINE FOR CAPPING BUNDLES OF TIE WIRES.

Application filed December 30, 1921. Serial No. 526,046.

*To all whom it may concern:*

Be it known that I, PARVIN WRIGHT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Capping Bundles of Tie Wires; and I 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 a machine for capping, preparatory to shipment, the ends of bundles of wires or bale ties used for banding packages, and has for its object to provide a mechanism which will be simple in construction, comparatively inexpensive to manufacture, and more efficient in action than those heretofore proposed.

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

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, side elevational view of a machine made in accordance with this invention;

Fig. 2 is a side elevational view of one form of cap suitable for use in this invention;

Fig. 3 is a side view partly broken away, of a bundle of wires or bale ties with the cap applied;

Fig. 4 is a sectional view of the parts shown in Figure 3;

Fig. 5 is a plan view of the parts shown in Figure 1;

Fig. 6 is a sectional view through the cap holding member and crimping cone showing the parts in position just before the cap is crimped into place;

Fig. 7 is a sectional view similar to Fig. 6, showing the position of the parts after the cap has been crimped into place;

Fig. 8 is an end elevational view of the segmental crimping cone and ring holding member detached from the machine;

Fig. 9 is a view on the line 9—9 of Fig. 8, looking in the direction of the arrows;

Fig. 10 is a view on the line 10—10 of Fig. 8 looking in the direction of the arrows;

Fig. 11 is a side elevational view of a modified form of cap;

Fig. 12 is a diagrammatic view partly broken away, of a bundle of tie wires provided with the cap shown in Fig. 11, crimped in position at each end; and

Fig. 13 is a sectional view of an end portion of the parts shown in Fig. 12.

In order that the invention may be the better understood, it is said: In recent years there has appeared on the market different types of machines, which twist together under tension parallel bights of a wire which has been wrapped around the package to be wired. These wires cannot conveniently be cut from a coil of wire and used in these machines, for they are so stiff their natural curvatures would make it inconvenient to handle the same. Therefore, it is customary to pass the coiled stiff wire through straightening machines which takes out this natural curvature, and cuts the wires into predetermined lengths of say from 8 to 12 feet, according to the size of the packages to be banded. The machine, while cutting these lengths of straightened wires, also provides their extreme ends with flattened portions by deforming or mashing down the same in order that they may the better function in the banding machine, and it may count out the wires into lots of, say 200. The result is a bundle 40, of wires having enlarged ends, so that each end of the bundle is larger than its normal body portion. This bundle is quite heavy, the wires are of mild steel, and as it has to be shipped for long distances to the place of use, it constitutes a troublesome problem to so protect the ends of the individual wires that they will not become injured during transportation and give trouble when operating the banding machine. Heretofore, the ends of the bundles 40 have been covered with heavy fabric material, which has been tied around the bundles, but the steel wires when stood on end soon cut through this covering, and become distorted. Such coverings although the best expedient devised prior to this invention, are nevertheless, very unsatisfactory in practice.

This invention overcomes the above men-

tioned objections by providing the means and mechanism now to be disclosed. Referring more especially to Figs. 1 and 5, 1 indicates any suitable support, on which is mounted a casting 2 having at one end a cap holding member 3, provided with an opening 4 to receive the caps and which opening is closed by a door 5 hinged as at 6. Said casting 2 is also provided near its middle portion with the standard 7, and at its other end portion with the enlargement 8, adapted to support the motor 9, and to supply the gear box 10, all as will be clear from Figs. 1 and 5. Said cap holder 3 is provided with the flange 11, through which pass the reciprocating rods 12, and which rods carry on one end the ring member 14 by any suitable fastening means, such, for example, as the nuts 13. Said rods freely reciprocate through the flange 11 and standard 7, by a means to be described, and therefore they move to and fro the cone shaped segments 15 which are secured inside said ring 14 by the connections illustrated. Outside said ring 14 said segments 15 are held together by the spring ring member 16 in such a manner as to form an expansible hollow cone, and this said cone and segments carry on the inner surface of its smaller end the beveled surfaces 18, adapted to contact with and to crimp inward toward their axes, the outer edges 21 of the caps 20.

The inner surface of the cap holding member 3 is beveled as at 21′ to receive the inner end of the hollow segmental cone 15, and the extreme smaller end of said cone 15 is beveled as at 22 in order to facilitate the sliding of the same on the interior 21′ of the cap holder 3, all as will be clear from Figs. 6, 7, 9 and 10.

The motor 9 is provided with the operating shaft 25 carrying the worm 26 engaging the worm gear 27 mounted on the shaft 28 carrying the cranks 29 at each end, and crank pins 30 to which are joined the rods or pitmans 31 connecting the reciprocating cross head 32 to which said pitmans 31 are pivotally secured as at 33. The rods 12 are provided with the nuts 34 and 35 located on each side of the cross head 32 and a considerable distance therefrom so that as said cross head reciprocates there is a considerable lost motion before the said rods 12 and segment cone 15 are reciprocated. On the other hand, the operation of the motor through the gearing just mentioned will move said cone 15 well out of the cone shaped portion 21′ of the capper 3 and cause it to dwell there for an appreciable time so that the operator can slip a cap 20 through the opening 4 into position, and can also slip a bundle of wires 40 through said segment cone 15 and into said cap, preparatory to crimping the same before the return of said segment 15, all as will be clearly understood from an inspection of Figs. 5, 6 and 7.

The operation of this machine will be readily understood from the foregoing, but may be briefly summarized as follows:

When a bundle of, say, 200 tie wires is to be capped, in order to protect their ends before shipment, said bundle 40 is thrust through the center of the hollow segmental cone member 15 and into the cap 20 which has been previously brought to the position illustrated in Fig. 6.

In the meantime, the motor 9 through the shaft 25, the gears 26 and 27, the cranks 29, the pitmans 31, the cross head 32, and the nuts 34 and 35, and the rods 12, will reciprocate said cone shaped member 15 in such a manner that when it reaches the position shown in Figure 7, its beveled surface 18 will have crimped inwardly the extreme edges 21 of the caps 20 and bring them into the position shown, behind the projecting deformed ends 55 of the individual wires illustrated.

After the caps 20 have been thus crimped into position, the bundle 40 of wires with the caps protecting its ends may be readily withdrawn owing to the fact that as the cone shaped member is reciprocated out of the capping member 3, its spring 16 will so enlarge or expand the smaller end of the cone as to enable the entire bundle and cap to be withdrawn through the axis of said cone and another cap to be brought into position. This expanding action is due to the fact that the members 15 pivot around the edge of the ring 14 as a center when the spring 16 draws together their larger ends. This drawing together of the said larger ends is facilitated by the cut away portions 59′.

In the somewhat modified form of the invention shown in Figs. 11, 12 and 13, the cap 56 is given a different shape from the cap 20 in order to better provide for the extreme projecting ends 55 of the individual wires and said cap is further provided with an extended flange shaped member 57 which is adapted to be crimped down into position by means of the interior surfaces 18 and 58 of the cone shaped members 15. In such case, however, the openings 59′ between the individual members of the cone, see Figure 10, are made much larger than in the preceding figures, so that the smaller end of the cone 15 may be opened much wider than in the preceding cases, and thus enable said cone to get a better grip on the cap 56. The capper 3 need not be changed to use the caps 56, for the bent portions 59 of said caps will occupy the cavity 60 somewhat to the left of the edges 21 of the caps 20, as seen in Fig. 6, and the inclined portions 57 of said caps 56 will be bent into

shape by the surfaces 18 and 58, of the expansible cone 15, as the latter closes down into its crimping position.

It sometimes happens that one wishes to reciprocate the cone 15 by hand to a different distance and at a different rate from that imparted by the motor 9. To accomplish this, I have provided the hand lever 62 pivoted to the capper at 63; and pivoted to said lever at 64 is the link 65 joined to the cross head 32 as at 66, see Figs. 1 and 5. In use, the lever may only reciprocate the cone 15 through the distance permitted by the nuts 34 and 35 without disconnecting the cross head 32 from the motor, or the cross head 32 may be disconnected from the motor in any suitable manner, as by slipping the pitmans 31 off their pivots 33, when the reciprocation of said lever 62 reciprocates the cone 15 through the rods 12, as will be readily understood.

In order to conveniently assemble the parts of the cone 15, the ring 14 is provided with a notch 67, through which after all the segments except the last have been assembled, may pass the lug 68 of said last segment, whereupon the ring 14 is turned and all parts locked together.

In order to start and stop the motor 9, there is provided a switch lever 70 pivoted at 71 and having a circuit closing portion 72 adapted to close the motor circuit at 73. Said lever 70 also has the bent portion 74 adapted to be struck by the extension 75 of the crank 29, as it turns in a clockwise direction, as seen in Fig. 1, and which automatically opens the circuit at each revolution of said crank and stops the motor, and makes ready for another operation. The momentum of the parts will cause the extension 75 to clear the portion 74, and it will also take up a part of the lost motion provided by the nuts 34 and 35.

The caps 20 and 56 may be made of any suitable material such as paper, fabric, metal, etc., according to the particular hard usage they are to endure, and they may be made with the well known crimped, corrugated, smooth or slit edges as desired. In fact, the lines 80 in Figs. 2, 11 and 12 are intended to represent either slits or corrugations that may extend to any desired distance along the body of the cap.

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

What I claim is:

1. In a tie wire capping machine the combination of a capping head having an inclined cone-shaped portion and a cylindrical portion adapted to receive a cap; an expansible cone-shaped crimping member provided with a beveled crimping surface on its extreme end and adapted to be guided by the cone-shaped portion of said head and to be forced into a crimping relation with said cap; and means for reciprocating said expansible crimping member, substantially as described.

2. In a tie wire capping machine, the combination of a capping head having an inclined cone-shaped portion, an opening through which caps may be passed, and a cylindrical portion adapted to receive a cap; an expansible cone-shaped crimping member provided with a beveled crimping surface on its extreme end adapted to be guided by the cone-shaped portion of said head and to be forced into a crimping relation with said cap; and means comprising a guide rod and a cross head for reciprocating said expansible crimping member, substantially as described.

3. In a tie wire capping machine the combination of a capping head having an inclined cone-shaped portion and a cylindrical portion adapted to receive a cap; an expansible cone-shaped crimping member adapted to be guided by the cone-shaped portion of said head and to be forced into a crimping relation with said cap; and means comprising a guide rod, a motor and connections between said motor and guide rod for reciprocating said expansible crimping member, substantially as described.

4. In a tie wire capping machine the combination of a capping head having an inclined cone-shaped portion and a cylindrical portion adapted to receive a cap; an expansible cone-shaped crimping member having a hollow interior through which may pass a bundle of wires to be capped, the crimping end of said crimping member adapted to be guided by the cone-shaped portion of said head and to be forced into a crimping relation with said cap; and means for reciprocating said expansible crimping member, substantially as described.

5. In a tie wire capping machine the combination of a capping head having a cylindrical portion to receive the cap and a cone-shaped portion to guide and compress the crimping member; a hollow expansible cone-shaped member whose smaller end is adapted to be guided and compressed by said first named cone-shaped portion and whose interior hollow portion is adapted to have the end of a bundle of tie wires passed therethrough and into the cap; and reciprocating means for operating said hollow cone-shaped member to crimp said cap about said bundle end, substantially as described.

6. In a tie wire capping machine the combination of a stationary capping head having a cylindrical portion to receive the cap and a cone-shaped portion to guide and

compress the crimping member; a reciprocating hollow expansible cone-shaped member whose smaller end is adapted to be guided and compressed by said first named cone-shaped portion and whose interior hollow portion is adapted to have the end of a bundle of tie wires passed therethrough and into the cap; and reciprocating means comprising a pair of guide rods, a cross head, a power applying means connected to said cross head for operating said hollow cone-shaped member to crimp said cap about said bundle end; substantially as described.

In testimony whereof I affix my signature.

PARVIN WRIGHT.