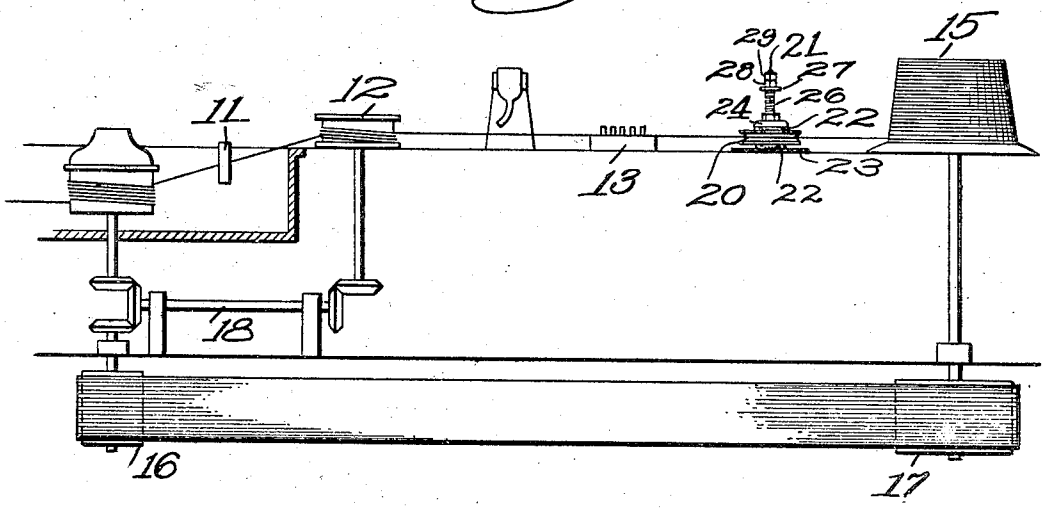
Nov. 20, 1923. 1,474,778

C. O. JOHNSON ET AL

METHOD OF AND MEANS FOR REDUCING, STRAIGHTENING, AND WINDING WIRE

Filed April 10, 1920

Fig. 1.



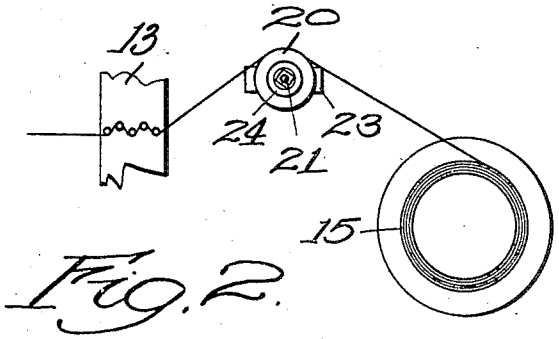


Fig. 2.

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UNITED STATES PATENT OFFICE.

CHARLES O. JOHNSON, CHARLES D. JOHNSON, AND BERNARD A. JOHNSON, OF WORCESTER, MASSACHUSETTS, ASSIGNORS TO WORCESTER WIRE WORKS, INC., A CORPORATION OF MASSACHUSETTS.

METHOD OF AND MEANS FOR REDUCING, STRAIGHTENING, AND WINDING WIRE.

Application filed April 10, 1920. Serial No. 372,992.

To all whom it may concern:

Be it known that we, CHARLES O. JOHNSON, CHARLES D. JOHNSON, and BERNARD A. JOHNSON, citizens of the United States, all residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Method of and Means for Reducing, Straightening, and Winding Wire, of which the following is a specification.

This invention relates to a method of and apparatus for reducing, straightening very fine wire and then coiling it on the usual block.

Heretofore when passing wire through a pin straightener and winding it on the usual conical block there was necessarily reduction in the drag on the wire as it passed through the straightener. This prevented the full utilization of the block because, on account of the inadequate tension, the wire would not run up to the top of the block and it was necessary to stop the operation frequently to take it off and start over. This results in the loss of considerable time.

We have discovered that the wire can be wound on the block even clear to the top of it in a very satisfactory manner, if it is properly put under tension between the straightener and the block so as to cause the wire always to be fed to the block under a regulated, strong, even tension. This enables us to continue the operation, without stopping, about three times as long as heretofore.

Reference is to be had to the accompanying drawing in which

Fig. 1 is a side view, partly diagrammatical, of a part of a wire drawing and straightening machine with a preferred form of this invention applied thereto, and

Fig. 2 is a fragmentary plan of the same.

In the drawings we have shown the final draw-head of an ordinary continuous wire drawing machine, the last die holder 11 and the rotary carrier 12 to which the wire is taken from the die, and which pulls it through it. These parts, as well as the ordinary winding block 15 are operated in any desired way, as for example, by shaft 18, connected gearing, and a belt on a pair of pulleys 16 and 17.

From the carrier 12 the wire passes to a pin straightener 13 which straightens the wire in a well known way as it passes through it to the block. The wire is drawn through the die under considerable tension, but the straightener cannot be so designed as to retain all the tension, because the wire would not stand it while in the act of being bent around the pins. The tension on the wire, therefore, is relieved as the wire is passed through the straightener. The slight tension created by the friction of the straightener is insufficient to wind the wire satisfactorily on the drum. Instead of passing the wire directly to the block, we provide, between the straightener and the block, a rotatable grooved tension wheel 20 to increase the tension on the wire between the device for tension adjustment and the drum. This idler is shown as mounted on a stationary shaft or stud 21 fixed in any convenient position on the machine, and on the two sides of this wheel are a pair of large leather discs 22 for creating friction. One of these discs rests against a supporting bracket 23 and the other against a metallic plate 24 which is longitudinally movable on the shaft or stud 21. It is provided with a central recess in which is located the end of a spring 26. This spring is centered on the stud 21 and extends upwardly to a washer 27. An adjusting nut 28 and locking nut 29 are shown for adjusting the tension of the spring and holding it in adjusted positions.

The wire, as shown, passes in the usual way to the straightener and then, preferably once, around the tension wheel 20. The act of drawing the wire through the straightener does not produce sufficient tension for coiling the wire on the drum and this insufficient tension is compensated for by the tension device. The spring is adjusted until it imparts just enough pressure to the leather or other friction discs to retard the wire as it passes over and around this wheel so that it will wind satisfactorily.

The wire in going through the straightener should not have tension at both ends, but only the pulling tension in drawing it through the straightener, because the very object sought to be accomplished would then be defeated so that the tension on the wire between the carrier and the straightener is not more than it would be if it was on a loose reel. The tension on the wire is not increased as it emerges from the straight-

ener, but it is increased between the adjustable idler, and the drum. The object of this is to have the coil form better by having an increased tension on the wire when it is wound around the drum. The act of pulling the wire through the straightener does not furnish sufficient tension for that purpose.

It will be understood that the block 15, as usual, is positively driven and draws the wire through the straightener. The effect of the retarding action of the idler wheel 20 is to keep the wire uniformly taut between this wheel and the block.

With this arrangment the tension on the wire as it passes to the block is regulated so that it is uniform and sufficient, and we find in practice that we can wind the wire clear to the top of the ordinary block practically all the time. This reduces the number of stops, and the time lost, from 60 to 70 per cent.

Although this invention can be used independently we prefer to use it in connection with the method and apparatus for drawing and straightening wire, set forth in the United States Patent No. 1,338,453, Serial No. 292,089, filed April 23, 1919, and we have shown it in connection with that apparatus.

Although we have illustrated and described only a single form of the invention and shown it as applied to a particular type of wire drawing and straightening machine, we are aware of the fact that modifications can be made, and that the invention can be applied to other types of wire straightening machinery without departing from the scope of the invention as expressed in the claims. Therefore we do not wish to be limited in these respects, but what we do claim is:—

1. In an apparatus for straightening and winding fine wire, the combination with a wire straightener and a block on which the wire is wound therefrom, of a grooved wheel located in position to receive the wire from the straightener and deliver it to the block, a stationary shaft on which the wheel is freely rotatable, a pair of leather discs on said shaft, one bearing on either side of said wheel, and means for constantly holding said discs yieldingly against the wheel.

2. The method of reducing, straightening and winding fine wire in one continuous operation, which consists in passing the wire from a die to a pin straightener, and then to a winding block and applying a resistance to the wire between the straightener and block to keep the wire uniformly taut as it passes to the block.

3. The method of straightening and winding fine wire in one continuous operation which consists in passing the wire from a die by means of a carrier to a pin straightener and then to a winding block, and applying a resistance to the wire between the straightener and block to keep the wire uniformly taut as it passes to the block.

4. The method of straightening and winding fine wire in one continuous operation, which consists in passing the wire from a die to a carrier, then to a pin straightener, and then to a winding block, releasing the tension on the wire between the carrier and the straightener, and applying a resistance to the wire between the straightener and block to keep the wire uniformly taut as it passes to the block.

5. In an apparatus for tensioning wire, the combination of a grooved wheel for receiving the wire to be tensioned, a stationary shaft on which the wheel is freely rotatable, a leather disc on said shaft bearing on the side of the wheel to supply tension, means located on said shaft for constantly holding said disc yieldingly against the wheel, and means on the opposite side of the wheel for creating friction thereon.

In testimony whereof we have hereunto affixed our signatures.

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