R. REED & A. D. FIVESHILLING.

WIRE TWISTING OR SPLICING MACHINE.

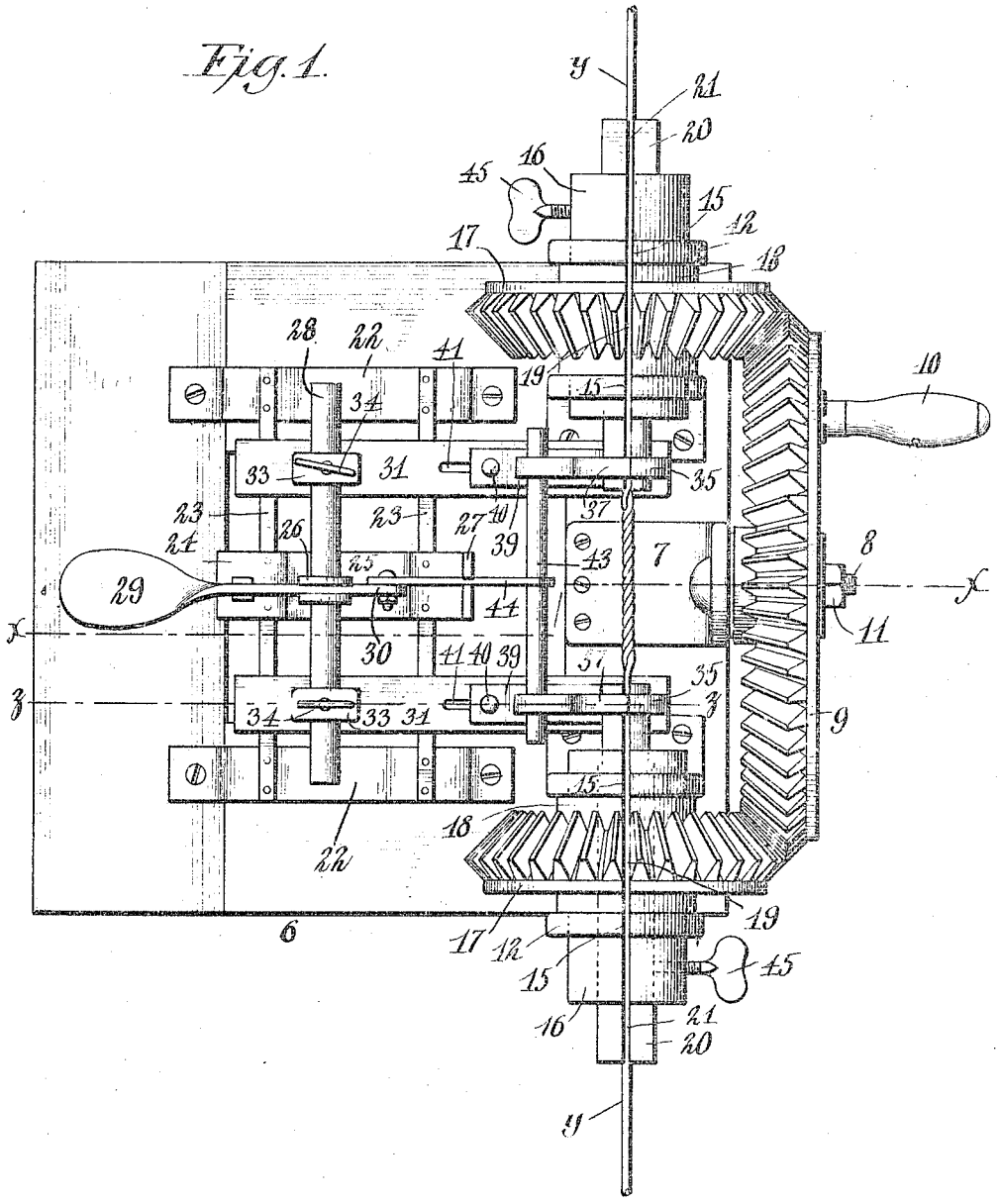
APPLICATION FILED APR. 15, 1912.

1,038,789.

Patented Sept. 17, 1912.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 2.

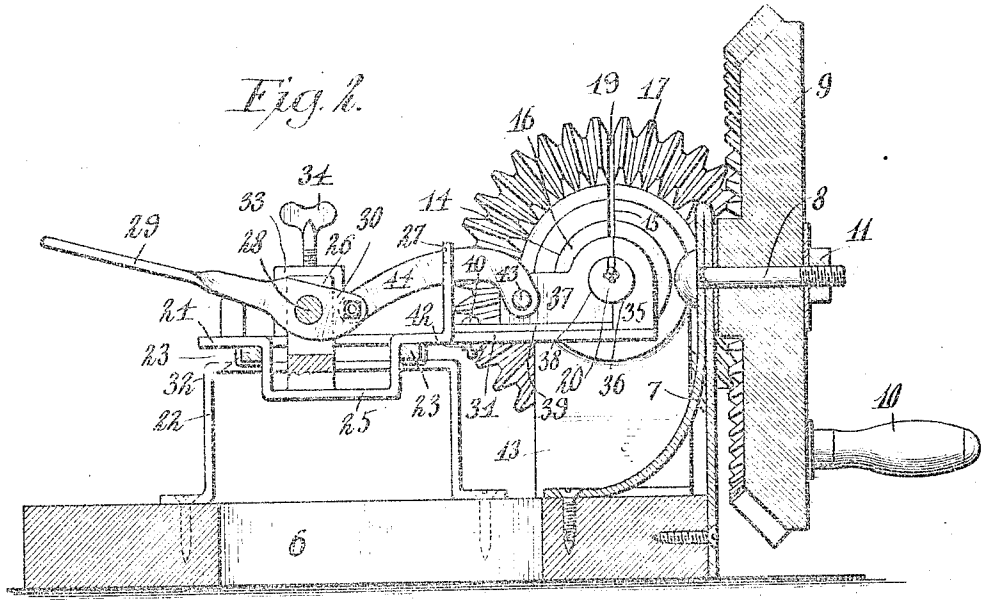
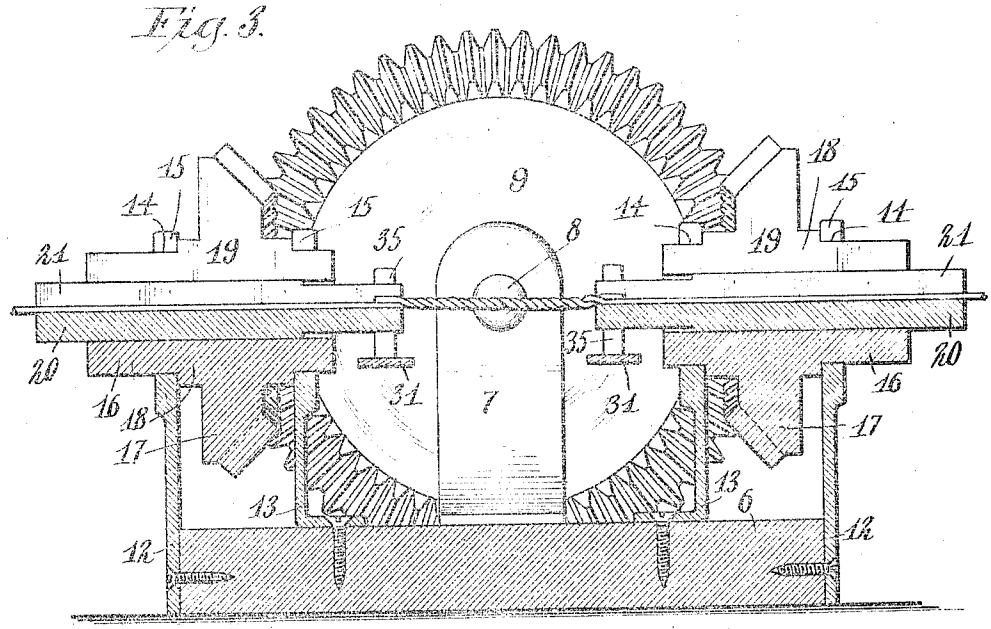


Fig. 3.



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3 SHEETS—SHEET 3.

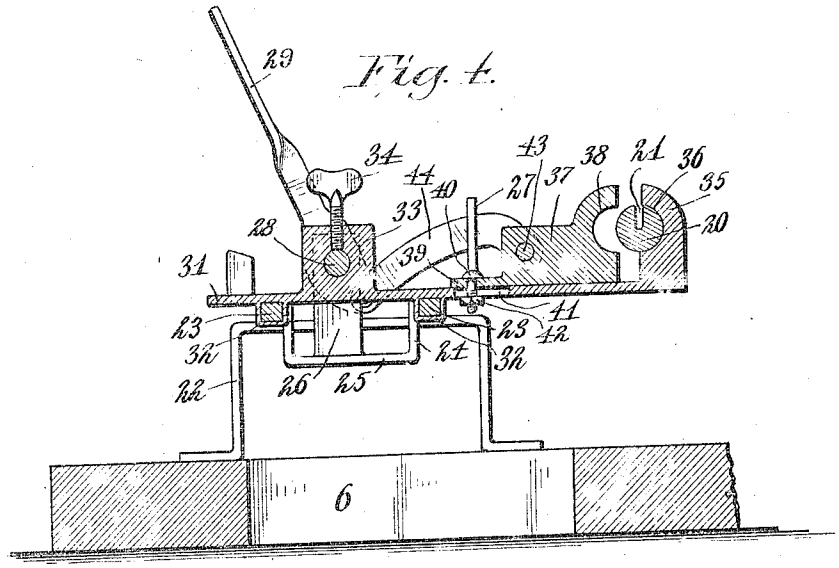

Fig. 4.

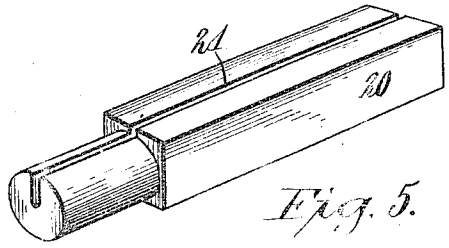

Fig. 5.

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UNITED STATES PATENT OFFICE.

ROY REED AND ALBERT D. FIVESHILLING, OF BUFFALO, NEW YORK.

WIRE TWISTING OR SPLICING MACHINE.

1,038,789. Specification of Letters Patent. Patented Sept. 17, 1912.

Application filed April 15, 1912. Serial No. 690,854.

To all whom it may concern:

Be it known that we, ROY REED and ALBERT D. FIVESHILLING, both citizens of the United States, and residents of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Wire Twisting or Splicing Machines, of which the following is a specification.

Our invention relates to wire twisting or splicing machines such as are used for splicing together two lengths of wire or for twisting together the ends of a single piece of wire.

The primary object of our invention is the production of a simple, inexpensive, and durable machine for the purpose mentioned in which provision is made to properly hold the ends of the wire together preparatory to and while twisting or uniting them.

Another object of our invention is to provide simple and effective means for regulating the length of the twist; and to otherwise improve on machines of this class.

With these objects in view, the invention consists in the novel features of construction and in the arrangement and combination of parts to be hereinafter described and particularly pointed out in the subjoined claims.

In the drawings,—Figure 1 is a plan view of a wire-twisting or splicing machine constructed according to our invention. Fig. 2 is a transverse section taken on line *x*—*x*, Fig. 1. Fig. 3 is a longitudinal section taken on line *y*—*y*, Fig. 1. Fig. 4 is a transverse section taken on line *z*—*z*, Fig. 1. Fig. 5 is a detached perspective view of one of the rotatable wire holding spindles.

Referring now to the drawings in detail, the reference numerals referred to indicate similar parts in the several figures.

The reference numeral 6 indicates a base on which the several supports or brackets supporting the operating mechanism are secured. This base may be of any suitable construction, and if desired, the several supports or brackets, to be hereinafter referred to, may be cast, stamped, or otherwise formed integrally therewith.

In the embodiment illustrated, a bracket 7 is secured to the base 6 at one side, in which is secured a spindle 8 having rotatably mounted thereon a bevel gear-wheel 9 provided with an operating handle 10 arranged near the periphery of said gear-wheel, said gear-wheel, which may be termed the "actuating gear-wheel" being held on said spindle by means of a nut 11 threaded thereon. At each end of the base is secured a pair of standards or supports 12, 13, spaced apart as shown in Fig. 3, said standards or supports being provided with circular openings 14 at their upper ends and slots 15 extending from said openings outward to the upper edge of said standards or supports. The circular openings serve as bearings for hubs 16 extending from opposite sides of bevel gear-wheels 17, which are in mesh with the actuating gear-wheel 9 at diametrically opposite points thereof. The said hubs are enlarged to provide shoulders 18, which bear against the inner or opposing sides of the two brackets of each pair in which they are journaled so as to prevent lengthwise movement of the gear-wheels 17 in said standards or supports. A bevel gear-wheel 17 is therefore journaled in each pair of standards or supports and held against lengthwise movement, each bevel gear-wheel 17 having a diametrical slot 19, which slots are of course extended halfway through the hubs of said gear-wheels. The bevel-gear wheels 17, by which term we include the hubs thereof, have non-circular axial bores, preferably square, in which are fitted so as to rotate therewith, wire-holding spindles 20. These spindles have cylindrical inner ends, for a purpose to be hereinafter described, and they are provided with longitudinal slots 21 which extend from end to end thereof and diametrically from their surfaces to points beyond the axis of the spindles. When these spindles are fitted into the bevel gear-wheels 17, the slots 21 thereof register with the slots in said bevel gear-wheels and at a certain point in the revolution of each of said bevel gear-wheels with its spindle, the slots in both register with the slots 15 in the standards or supports 12, 13, thus permitting the introduction of opposite ends of a length of wire, or the adjacent ends of two lengths of wire, depending on the purpose the twist or splice is to serve.

In order to successfully twist the wire or wires, means must be provided to retain the same in proper position within the slots of the wire-holding spindles 20, and for this purpose a pair of brackets or supports 22 rise from the base and are secured thereto. These brackets are arranged transversely

and have secured thereto a pair of longitudinally disposed guide-rods 23. Secured mid-length to said guide-rods is a bracket 24 having a depressed central portion 25 from which rises a bifurcated supporting arm 26 and at that end of the bracket nearer the actuating gear-wheel 9 a bifurcated guide arm 27 rises therefrom. Secured to the bifurcated supporting arm 26 and disposed parallel with the guide-rods 23 is a guide-rod 28 which extends through said supporting arm and in opposite directions therefrom and serves also as a pivot for an actuating lever 29 which is provided with an inward extension 30 and located in the bifurcated portion of said arm. Adjustable on the longitudinal rods 23 is a pair of retainer bars 31 arranged transversely and on opposite sides of the bracket 24, each retainer bar having loops 32 on its underside through which said longitudinal rods are passed and also an upstanding ear 33 through which the guide rod 28 is passed, each ear having a thumb-screw 34 threaded thereinto and adapted to impinge against said guide-rod. It may therefore be said that the retainer bars are adjustable on both the guide rods 23 and 28 and may be held in any adjusted position by said thumb-screws. Said retainer bars extend beyond the wire-holding spindles 20 and have upstanding lugs 35 provided with semi-circular notches 36 into which the cylindrical inner ends of the wire-holding spindles are seated, said lugs, however, leaving free access to the slots 21 within said spindles. Movable lengthwise on said retainer bars are slidable retainer-blocks 37, each having a semi-circular notch 38 arranged in opposition to the notch 36 in its coöperating lug 35 and having also a flat extension 39 through which is passed a bolt 40 which extends through a slot 41 in the retainer bar and has threaded thereon a nut 42 which bears against the underside of said retainer bar. In this manner the slidable retainer blocks are confined to movement in a straight line toward and from their coöperating lugs 35 and with said lugs may be said to provide a pair of clamping or retainer members adapted to embrace the inner cylindrical ends of the wire-holding spindles 20 and serve to retain the wires in the slots 21 of said spindles.

The slidable retainer blocks 37 are actuated by means of the actuating lever 29, and for this purpose the two retainer blocks are connected by a cross bar 43, which has pivotal connection with one end of a link 44 whose other end is pivotally connected to the inward extension 30 of said lever. The connection of said retainer blocks may be said to be a loose connection in that the cross bar 43 passes loosely through openings in said blocks, thus allowing the latter to slide on said cross-bar.

The wire-holding spindles 20 are adjustable lengthwise within the bevel gear-wheels 17 so as to regulate the distance or space between their inner ends, which distance or space governs the length of the splice or twist to be made; and for the purpose of retaining the spindles in any adjusted position, thumb-screws 45 are threaded into the hubs of said bevel gear-wheels and impinge against the square portions of said spindles.

From the foregoing it will be clear that the wire-holding spindles are relatively movable to govern the length of the splice or twist to be made and in positioning the wires within the machine, the gear-wheels 17 are rotated to bring the slots 19 therein in line with the slots 15 of the two pair of standards or supports 12, 13 and as the slots 21 in the wire-holding spindles 20 are always in line with those in said gear-wheels, the wires can be easily entered into the slots of said wire-holding spindles with the end portions thereof arranged in opposite directions, the extremity of each end terminating in one of the spindles and being held therein against turning, for which purpose the slots in the spindles are made of a size somewhat wider than the diameter of the wire to be twisted, but of course, narrow enough to prevent the two wires turning therein. It will also be noticed that there is no support provided for the wires between the adjacent ends of the wire-holding spindles so that a continuous or unbroken twist results from the operation of the machine, and owing to the bevel-gear wheels 17 meshing with the actuating gear-wheel 9 at diametrically opposite points, said gear-wheels 17 with their contained wire-holding spindles are rotated in opposite directions, thus twisting the wire from two points or sides, which assures increased output.

When the operator adjusts the wire-holding spindles with the bevel gear-wheels 17, he adjusts the retainer bars 31 accordingly, so that the clamping or retaining members of said bars will embrace the cylindrical inner portions of said wire holding spindles at or near their inner extremities. To accomplish this, it is only necessary to loosen the thumb-screws 34 and shift said retainer bars toward or from each other according to the adjustment of said wire-holding spindles, during which action the slidable retainer blocks 37 slide on the cross bar 43.

The present invention is in no wise restricted to size, material, or exact details of construction, nor to any other limitations of the description, unless expressly so stated in the following claims. Thus it is possible to secure some of the advantages of our invention within the scope of this patent by elimination of some of the parts or by modification of some of the parts, and it is our in-

tention to have the claims of this patent given the broadest possible interpretation permissible by the prior art.

Having thus described our invention, what we claim is,—

1. In a machine of the kind described, two axially coinciding longitudinally-slotted spindles, means for rotating said spindles in opposite directions, and wire-retaining means co-acting with each of said spindles, each of said wire-retaining means comprising a portion notched to embrace one-half of its coöperating spindle and a co-acting portion notched to embrace the other half and being movable toward and from its co-operating spindle.

2. A machine of the kind described, comprising a pair of oppositely rotating spindles provided with longitudinal wire-receiving slots, means co-acting with each spindle for retaining the wire or wires in the slots thereof, said means comprising a slotted bar arranged at right angles to its coöperating spindle and having an upstanding lug notched to fit around one-half of said spindle and a sliding retainer block on said bar movable lengthwise thereof and notched to fit around the other half of said spindle, thus closing the slot of said spindle to prevent accidental removal of the wire therefrom.

3. In a machine of the kind described, the combination with a base having a pair of spaced supports, a pair of guide-rods extending from one pair of said supports to the other, a pair of retainer bars arranged at right angles to said guide-rods and movable relatively on said guide-rods, a pair of axially coinciding wire-holding spindles provided with longitudinal slots and being movable relatively, and means on said retainer bars embracing the adjacent ends of said spindles to retain the wire or wires being twisted in the slots thereof, said embracing means including a part movable to permit the insertion of the wires into the slots and the removal of the same therefrom.

4. In a machine of the kind described, the combination with a base having supports rising therefrom, axially-alined spindles rotatable in said supports and relatively movable, said spindles having longitudinal slots therein, means for rotating said spindles in opposite directions, a pair of supported guide-rods spaced apart and arranged parallel with said spindles, a pair of retainer bars spaced apart and movable relatively on said guide-rods, each retainer bar coöperating with one of said spindles and having an upstanding lug extending substantially around one-half of its coöperating spindle, a slidable block embracing the other half of said spindles to prevent accidental removal of the wire or wires from the slots in said spindles, and means for simultaneously moving said slidable blocks to permit insertion of the wires into the slots of said spindles or the removal therefrom.

5. In a machine of the kind described, the combination of a pair of axially alined spindles having longitudinal slots therein, means for rotating said spindles in opposite directions, a pair of guide-rods arranged parallel with said spindles, a bracket secured to said guide-rods and having an upstanding guide-arm and an upstanding bifurcated supporting arm, a pair of retainer bars arranged on said guide-rods and movable relatively, said retainer bars having means at one of their ends to embrace the adjacent ends of said spindles and prevent the accidental removal therefrom of the wires inserted in the slots of said spindles, an operating lever fitting into said bifurcated supporting arm and having a portion extending inward therefrom, a single guide-rod passing through said bifurcated supporting arm and extending in opposite directions therefrom parallel with said first-mentioned guide-rods, said single guide-rod serving as a pivot for said operating lever, and said retainer bars having upstanding lugs through which said single guide-rod loosely passes, thumb-screws threaded into said lugs and adapted to impinge against said single guide-rod, and a link connecting the inner extending portion of said operating lever with said wire retainer means.

6. In a machine of the kind described, a pair of axially alined spindles having longitudinal slots therein and being relatively movable, a pair of retainer bars having portions extending around one-half of each of said spindles and each having a slot arranged lengthwise therein, a retainer block on each of said retainer bars adapted to extend around the other half of its coöperating spindle, a bolt passing through each retainer block and extending through the slot in its supporting retainer bar, nuts threaded onto said bolts, a cross rod passing through said retainer blocks, and means for moving said cross-rod toward and from a plane in which said spindles are held.

In testimony whereof, we have affixed our signatures in the presence of two subscribing witnesses.

ROY REED.
ALBERT D. FIVESHILLING.

Witnesses:
H. W. PALMER,
GEO. V. WILDE.