

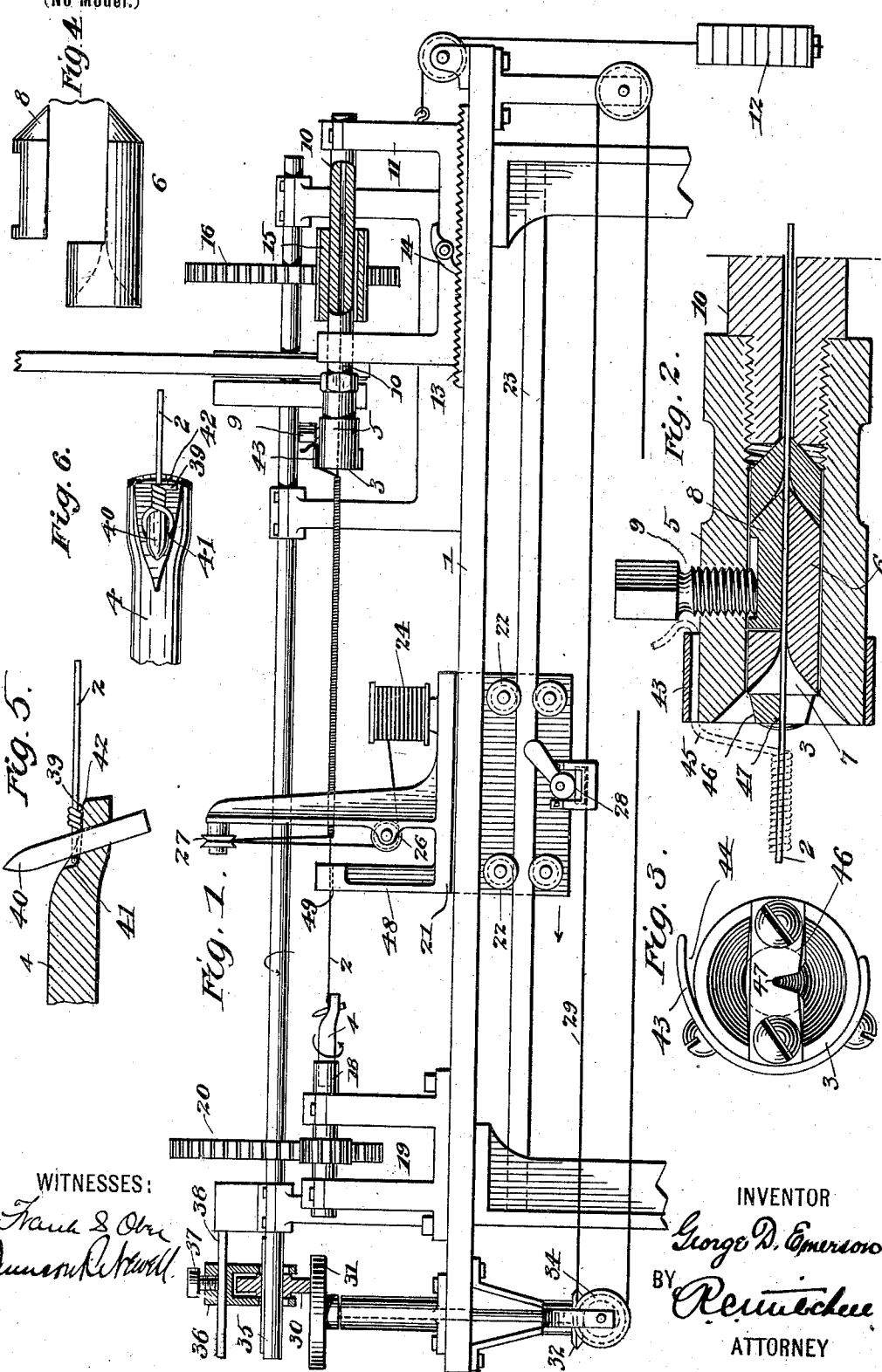
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Patented Oct. 17, 1899.

G. D. EMERSON.
WIRE WINDING MACHINE.

(Application filed Mar. 9, 1899.)

(No Model.)



WITNESSES:
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WIRE-WINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 635,039, dated October 17, 1899.

Application filed March 9, 1899. Serial No. 708,299. (No model.)

To all whom it may concern:

Be it known that I, GEORGE D. EMERSON, a citizen of the United States, residing at New Brunswick, Middlesex county, New Jersey, have invented certain new and useful Improvements in Wire-Winding Machinery, of which the following is a full, clear, and exact description.

My invention relates to wire-winding machinery; and my object is to improve the construction of the same. It is particularly applicable to machines for winding wire with a covering of wire, as in piano or guitar strings and the like.

In the preferred embodiment of my invention shown in the drawings, Figure 1 is a side elevation, partly in section. Fig. 2 is an enlarged longitudinal sectional view of the chuck. Fig. 3 is an end elevation of the chuck. Fig. 4 is a detail. Fig. 5 is an enlarged view of the holder for the other end of the wire. Fig. 6 is a plan view of Fig. 5.

In the embodiment shown in the drawings, 1 represents generally the frame of the machine.

2 is a wire to be wound. This wire is held at one end in this embodiment by a chuck 3, which clasps the wire tightly, and at the other end by a holder 4, in this embodiment in the form of a hook of novel construction, over which a loop in the wire may be placed. (See Figs. 5 and 6.) This chuck has an outer casing 5 and an inner seat 6, tapering at its outer end, as at 7, to guide the entering end of the wire.

8 is a clamping-shoe, and 9 is a screw extending through the casing and adapted to be screwed down upon the shoe, clamping between it and the seat the said wire.

10 is a tubular guide for the end of the wire, extending longitudinally beyond the chuck and carried out in the direction of the axis of rotation of the chuck and in this embodiment attached to and rotatable with the chuck, as shown. In winding piano or other musical strings, for instance, it is desirable to leave a projecting end of the wire which is wound for insertion into the holes in the tuning-pins, and to accomplish this the wire is passed through the chuck into the tubular guide 10. When the chuck and wire are rotated, this guide prevents the end of the wire projecting from the chuck threshing around and becoming

ing bent or broken. The chuck, and in this embodiment the guide 10 also, is rotatably supported by a movable tension-carriage 11, so as to draw and keep the wire 2 taut. This tension is accomplished by the weight 12 or other suitable means.

13 is a rack, and 14 a suitable latch, to prevent the motion of the tension-carriage in either direction, as desired.

15 is in this embodiment a toothed wheel on the guide 10, and this wheel is engaged by a toothed driving-wheel 16 on the driving-shaft 17. The wheel 15 may be and as shown herein is of sufficient breadth of face to allow of the motion of the tension-carriage without disengagement of said wheel from the wheel 16.

18 is a shaft carrying the holder 4, and to this shaft is fixed a toothed wheel 19, engaged by a second driving-wheel 20, also on the shaft 17. The gearings between the driving-shaft 17 and the chuck 3 and holder 4 are preferably so related that the chuck 3 and holder 4 will be rotated at the same angular speed and in the same direction. The wire therefore will not be twisted, but will be rotated therewith.

48 is an arm which is provided with a suitable opening or recess 49, through or in which the wire 2 passes and by which the same is prevented from being drawn laterally with respect to its axis to any substantial extent by reason of the tension upon the covering-wire 24 while the latter is being wound upon the wire 2. This arm 48 may be carried by the guide 21 and travels therewith just to one side of the portion of the wire 2 being wound, giving, therefore, a very short leverage for the covering-wire 24 to pull the wire 2 out of line.

To automatically make the covering uniform, I have provided a guide 21 for the covering material, which is automatically moved along said wire. This movable guide is mounted on wheels 22, running on the track 23. The guide carries the spool 24 of covering material, such as the wire 25, which passes over suitable pulleys or guides 26 and 27 and then to and around the wire 2. The guide can be clamped, as at 28, to a traveling belt 29, which will move longitudinally of said wire 2. This belt is moved by a wheel 30 on the shaft 17, which preferably frictionally engages a second wheel 31, whose axis of rotation is preferably at right angles to the wheel 30. The

shaft on which wheel 31 is mounted carries a beveled gear 32, engaging beveled gear 33, around which the belt 29 passes. The wheel 30 is preferably fixed to the shaft 17 by the key 35 so as to be movable longitudinally on said shaft 17, but not rotatable around the same. 36 is a carrier for this wheel, which can be fixed by the screw 37 to the guide 38. As this wheel 30 is movable toward and from the axis of rotation of wheel 31, the effective radius of contact of wheel 31 will be diminished or increased and the relative angular speed of the two wheels can be varied, wheel 31 being driven faster or more slowly as the wheel 30 is moved nearer to or away from, respectively, the center of axis of rotation of 31. The rapidity of movement of the guide 21 may therefore be varied as desired.

When it is desired to cover a wire, a loop is formed in the same, as shown in Fig. 5, preferably leaving the laterally-projecting end 39. The loop is then placed over the pin 40 of the holder and pressed down into the recess 41. 42 is a laterally-projecting supporting-platform against which the projection 39 will strike when the wire is rotated in the direction indicated by the arrow in said figure, as the tension of the covering-wire 25 will tend to twist the wire 2 in a direction opposed to this motion. As the end comes in contact with the platform 42 it will prevent the loop in the end of the wire being twisted up more tightly or untwisted. Any number of covering-wires may be thus applied.

43 is a gripping device for the end of the covering-wire 25, carried by the chuck. In the present embodiment this gripping device is a clip consisting of a piece of spring metal, providing a wedge-shaped opening 44, into which the end 45 of the wire 25 may be jammed, as shown in Fig. 2. The machine is then started in motion, and as the chuck 3 and holder 4 are rotated the wire 25 will be wound around the wire 2 and the guide 21 will move along the wire with a speed depending on the position of wheel 30 with reference to wheel 31 and may thus apply a regular and uniform covering to said wire.

The seat 6 is held in place by a bridge 46 across the end of the chuck, as shown. This bridge has preferably an opening 47, which aids in centering the wire. Since it is desirable to flare the opening into the chuck, as indicated, so that the wire 2 may be more readily inserted, the bridge 47 is very useful and provides a means at the extreme forward end of the chuck for centering the wire 2, which otherwise would find its centering-support in the extreme rear end of the flared opening in the chuck.

It is obvious that many changes may be made in the embodiment herein disclosed without departing from the spirit of my invention.

65 What I claim is—

1. In a wire-winding machine in combination a chuck to clamp the end of a wire, said

chuck having a hollowed extension therefrom into which the end of said wire is adapted to project, a holder for the other end of said wire and means to rotate said chuck and holder, and means to apply a covering upon said wire between said chuck and holder. 70

2. In a wire-winding machine in combination a chuck to clamp the end of a wire, said chuck having a hollowed extension therefrom into which the end of said wire is adapted to project, a holder for the other end of said wire, means to rotate said chuck and holder and wind a wire tightly upon said wire between said chuck and holder. 75 80

3. In a wire-winding machine in combination, a chuck to clamp the end of a wire to be covered, having a clip thereon forming a wedge-shaped aperture to receive and hold the end of the covering-wire, said chuck having a hollowed extension therefrom into which the end of said wire to be covered is adapted to project, a holder for the other end of said wire and means to rotate said chuck and holder. 85 90

4. In a chuck in combination, a case, an inner removable seat for a wire having a hole therethrough, said hole being substantially on the axis of rotation of said chuck, the outer end of said seat being countersunk to guide the wire to said hole therein, a screw through said casing adapted to clamp the wire to said seat, and a removable means to hold said seat in place in said chuck. 95 100

5. In a wire-winding machine in combination, a chuck, means to rotate the same, means carried by said chuck and adapted to clamp a wire therein and hold it on the axis of rotation of said chuck, and a projection from the end of said chuck having a centering portion thereon adapted to receive and assist in holding said wire on said axis of rotation. 105

6. In a wire-winding machine in combination, a chuck having a countersunk portion at its end, means to rotate the same, means carried by said chuck and adapted to clamp a wire therein and hold it on the axis of rotation of said chuck, and a projection from the end of said chuck having a centering portion thereon adapted to receive and assist in holding said wire on said axis of rotation. 110 115

7. In a wire-winding machine in combination, a rotatable holder for each end of a looped wire, one of said holders comprising a flattened platform against which the loop of said wire may bear, the support for said loop being located out of the axis of rotation sufficient to hold the wire in the axis of rotation, a projection carried by said support so as to pass through said loop, said projection being inclined in a direction opposite to the pull of the wire. 120 125

Signed at New Brunswick, New Jersey, this 27th day of February, 1899.

GEORGE D. EMERSON.

Witnesses:

W. R. McCLELLAND,
E. T. BANALOW.