

(No Model.)

2 Sheets—Sheet 1.

H. E. HEATH.
WINDING OR TAPING MACHINE.

No. 535,107.

Patented Mar. 5, 1895.

Fig. 1.

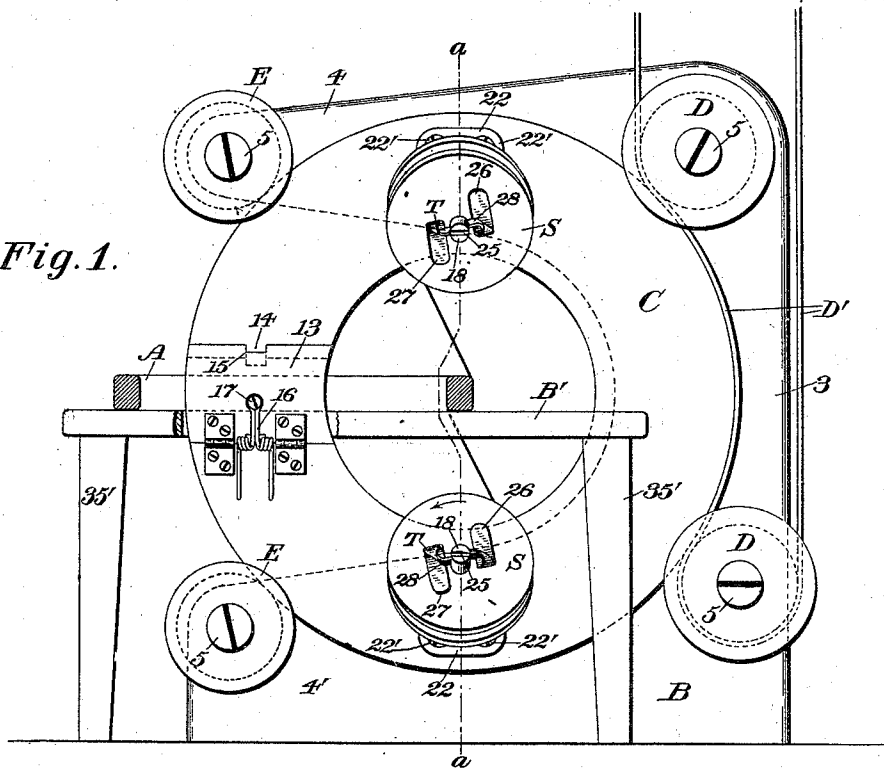
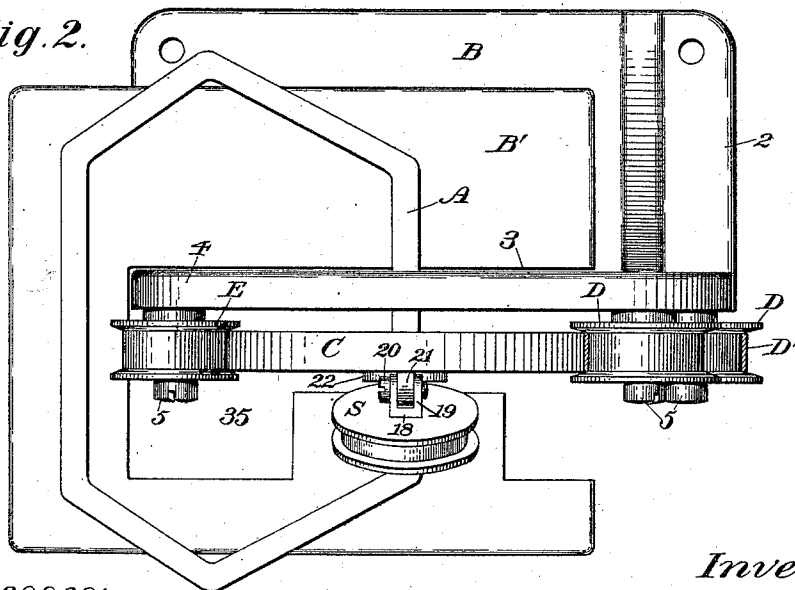


Fig. 2.



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UNITED STATES PATENT OFFICE.

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ELECTRIC MANUFACTURING COMPANY, OF SAME PLACE.

WINDING OR TAPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 535,107, dated March 5, 1895.

Application filed May 17, 1894. Serial No. 511,556. (No model.)

To all whom it may concern:

Be it known that I, HARRY E. HEATH, a citizen of the United States, residing at Windsor, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Winding or Taping Machines, of which the following is a specification.

This invention relates to winding or taping machines; the object of my present invention being to furnish a machine especially adapted for winding or covering armature-coils, and to so construct and organize the parts of the machine that various forms of armature-coils or closed rings may be wound or taped with rapidity and economy, and whereby the winding-spools may be set at an inclination to the axial line of the coil being wound, so that the tape may be applied to the coil in overlapping layers obliquely to the peripheral line of said coil, if desired.

Another object of the invention is to provide improved means for removably supporting the tape-carrying spools, and also to provide improved tension-devices in connection with said spools.

In the drawings accompanying and forming a part of this specification, Figure 1 is a front view of a winding or taping machine embodying my invention, the armature-coil being shown in section, and a portion of the table for supporting said coil being broken away, said figure illustrating the operation of winding or taping a coil. Fig. 2 is a plan view of the same. Fig. 3 is a vertical section taken in line *a-a* of Fig. 1, looking toward the right-hand in said figure. Figs. 4 and 5 are edge views of a portion of the revoluble spool-carrier, showing the hinged section in its open and closed positions, respectively. Fig. 6 is an enlarged end view of one of the spool-carrying studs showing the manner of securing the tension device thereto. Fig. 7 is a side view of a portion of said stud.

Similar characters designate like parts in all the figures.

In the form thereof herein shown, the winding or taping machine comprises a frame, B, which may be of any suitable construction for carrying the several operative details, a recessed table, B', for supporting the arma-

ture-coil to be wound, an annular or axially recessed wheel-like carrier, C, supported for rotation between a series of peripherally-disposed wheels carried upon studs secured to the frame, two of which wheels constitute drivers for the revoluble carrier, a friction driving-belt, D', carried over said drivers in contact with the revoluble carrier, a series of circumferentially-disposed tape- or strand-carrying spools, S, supported for rotation at one side of the carrier C, and spool-retaining tension-devices, T, in connection with said spools, all of which will be hereinafter more fully described.

The framework of the machine is shown consisting of the base 2 and upright or side-plate 3, which side-plate is recessed at its forward edge to form the forwardly-projecting arms 4 and 4', as most clearly shown in Figs. 1 and 3 of the drawings.

Revolubly supported upon studs, 5, secured to the framework and equi-distantly disposed with relation to a common center, is a series of carrier-supporting and driving wheels, D—D, and E—E, the ones D—D of which constitute the drivers for said carrier, and the ones E—E of which are in the nature of idlers and simply act as supports for said carrier. The idle wheels E—E, herein shown as two in number, are peripherally grooved and are supported at the extreme ends of the arms 4 and 4' of the framework, while the driving-wheels D—D, which are also shown as two in number and as peripherally grooved, are carried upon the side-plate 3, near the rear edge thereof, as clearly illustrated in Fig. 1 of the drawings. The number and position of these wheels just described may be varied as circumstances may require.

The winding-wheel, or revoluble carrier, C, in the form thereof herein shown, is in the nature of an axially-recessed disk, or annular ring, having one side thereof cut away, as shown at 10, to form a coil-entering space, in which will preferably be fitted a movable section, 13, which in this form of my invention is in the nature of a door or gate, hinged at one side-edge to the side of the carrier adjacent to said opening 10.

The gate or movable section 13 will be of such construction that its periphery will coin-

side with, and complete the continuity of, the periphery of said revoluble carrier C when said section is in its closed position, as illustrated in Figs. 1 and 4, the end of the carrier C adjacent to the opening end of the gate preferably having a transverse flange, 14, adapted for entering a groove, 15, in the end of the gate to prevent accidental disalignment of the periphery of the gate with the periphery of the carrier during rotation of said carrier.

As a convenient means for automatically closing the gate, I have shown the same provided with a spring, 16, preferably secured at one end to the gate by a screw, 17, and having resilient arms in engagement with the revoluble carrier adjacent to the hinged edge of the gate. Any form of spring other than that herein shown might, however, be employed for automatically closing the gate.

To form a suitable abutment for the gate, the swinging end of the gate, and the end of the carrier adjacent thereto, will preferably be beveled or inclined, as most clearly illustrated in Figs. 4 and 5. In this embodiment of my invention, the tape- or strand-carrying spools S, herein shown as two in number and oppositely-disposed, are supported for rotation upon shouldered pins or studs, 18, the inner ends of each pin being preferably bifurcated, as shown at 19, and removably and adjustably secured, by means of a clamp-screw, 20, to a projection or ear, 21, upon a bracket, 22, fixed to the side-face of the revoluble carrier C, said bracket being secured to the carrier preferably by means of screws, 22', in the manner shown in Fig. 1.

It will be seen from Figs. 2 and 3 that the studs 18 have a swinging or pivotal movement upon the ears 21, the plane of said swinging movement passing through one of the diameters of the carrier, and that the locking of each stud to its ears is effected by simply tightening the clamp-nut until the side-walls of the bifurcated end of the stud are in rigid connection with said ear and swinging movement thereof upon the ear and the screw is thereby prevented.

As a means for removably securing the tape-carrying spools upon their respective pins or axles, the outer end of each pin is shown transversely grooved or notched, as at 25, to receive a key, or spool-retaining tension-device, T, which key or tension-device, in the form thereof herein shown, is in the nature of a Z-shaped spring, the two ends 26 and 27 of which are adapted to bear upon the face of the spool to hold the same under tension and prevent a too-free rotation thereof, the connecting-bar 28 between the two ends 26 and 27 being herein shown as bent at right angles to said ends and extending through the slot 25 in the end of the spool-carrying pin 18. To facilitate the locking of the tension-device or key in engagement with the spool-carrying pin 18, the slotted portion, 25, of said pin is undercut, as shown at 29, at

both ends at opposite sides to form a retaining-flange, 30, at each end of said slot, under which the connecting-bar 28 of the key or tension-device is extended when the parts are assembled and in working position. By this construction, the two ends of the tension-device projecting in opposite directions and having a bearing contact with the face of the spool, it will be seen that when the key or tension-device is inserted in the transverse slot 25, a partial rotation of the spool in the direction of the arrow shown in Fig. 1, will seat the connecting-bar, 28, of the tension-device under the flanges 30, which will prevent displacement thereof during a continued rotation of the spool when the machine is in operation, the rotation of the spool, owing to the frictional contact of the tension-device therewith, constantly holding the said device in the position shown most clearly in Fig. 6, and preventing displacement thereof. This forms a simple and effective locking means for the tension-device. When it is desired to remove the spool, it is simply necessary to turn the said spool in a direction opposite to that just described, which will carry the tension-device with its cross-bar out of engagement with the retaining-flanges 30, and, owing to the stress of the spring-ends, said tension-device will be thrown out of engagement with the spool-carrying pin through the slot 25, when the spool may be readily removed.

In practice the tape-carrying spools will usually be set with their axes at an inclination to the axis of the revoluble carrier, so that the winding of the armature-coil may take place at a point in alignment with the periphery of the revoluble carrier, as most clearly shown in Fig. 3, said tape-carrying spools being so disposed with relation to each other that the tape carried by one will, during the process of winding, partially overlap the tape of the other spool, as will be understood by reference to said figure. This arrangement of the tape-carrying spools just described, may, it will be understood, be modified to meet the requirements.

In practice, where it is desired to set the tape-carrying spools with their peripheries at an inclination to the periphery of the carrier, the clamping ends of the spool-carrying pins may be made slightly resilient and have their clamping-faces corrugated or toothed to engage corrugations or teeth upon the bracket to which said pins are clamped, which construction will provide a simple means for holding the spools against lateral movement after adjustment.

As a convenient means for rotating the spool-carrier, I have provided a carrying-belt, D', which extends over the inner faces of the two wheels D, and is held thereby in frictional engagement with the periphery of said carrier C, thus imparting power directly to said carrier from the driving-belt and securing better results than if the carrier was driven directly from the wheels D.

As a means for supporting the armature-coil in position for being wound, I have provided a table, designated in a general way by B', which is centrally divided, as shown at 35, so as to straddle the spool-carrier and permit the unobstructed rotation thereof together with the spools, said table being supported at its ends upon suitable legs, 35', as clearly shown in Figs. 1 and 3.

Having thus described my invention, I claim—

1. The herein-described winding- or taping-machine comprising an annular revoluble spool-carrier, peripherally-disposed supporting-wheels therefor, one or more tape- or strand-carrying spools rotatively mounted upon corresponding studs, means for pivotally securing said studs to the side of the spool-carrier and for locking the studs upon the carrier in their adjusted positions, spool-retaining tension-devices carried by the spool-carrying studs and bearing against said spools said tension-devices being loosely mounted upon said studs and adapted to be maintained in position by the rotation of the spools, and means for rotating the carrier, substantially as described.

2. In a winding- or taping-machine of the class specified, the combination with an annular spool-carrier peripherally supported for rotation, and with a bracket secured to the side of said spool-carrier, of a stud, a tape- or strand-carrying spool rotatively mounted upon said stud, means for pivotally securing said stud to said bracket and for locking said stud to the same, a tension-device rotatively carried by said stud and bearing against the face of the spool said tension-device being loosely mounted upon said stud and adapted to be maintained in position by the rotation of the spool, and means for rotating the spool-carrier, substantially as described.

3. In a winding- or taping-machine, the combination with an annular or axially-recessed spool-carrier, of oppositely-disposed tape-carrying spools revolubly supported at one side of said carrier and so inclined to the plane of movement thereof that their planes of movement intersect each other and also intersect said plane of the carrier and pass through the axis of the carrier, substantially as described.

4. In a winding- or taping-machine, the combination with an annular spool-carrier, of a stud, a tape-carrying spool mounted upon said stud and adapted for rotation in a plane at an inclination to the plane of rotation of said carrier, and a clamp-screw adapted for

pivotally-securing said stud to one side of the carrier and for locking said stud in its adjusted position to prevent pivotal movement of said stud, substantially as described.

5. In a winding or taping machine, the combination with the annular spool-carrier, of the spool-supporting pin or stud secured at one end to the side of said carrier and having a lock-notch formed at its opposite end, a spool revolubly supported upon said pin or stud, and a tension-device shiftably supported in said lock-notch and adapted to be held in place by the rotation of the spool, substantially as described and for the purpose set forth.

6. In a winding- or taping-machine, a revolubly-supported annular spool-carrier cut away at one side and provided with a hinged section or gate whose periphery coincides with the periphery of the carrier, said spool-carrier having a transverse flange adapted to enter a recess in said gate, and a spring in position and adapted for exerting a lateral pressure upon said gate to maintain the gate in position, substantially as described.

7. In a winding or taping machine, the combination with the annular spool-carrier, of a tape-carrying spool revolubly supported upon a pin or stud at one side of said carrier, a resilient tension-device connected with said pin or stud and having two oppositely-disposed arms in bearing contact with the face of the spool, and adapted to be held in place by the rotation of the spool substantially as described and for the purpose set forth.

8. In a winding- or taping-machine, the combination with an annular spool-carrier peripherally supported for rotation and having a peripheral driving-wheel, of a driving-band or belt extending around and in frictional engagement with a portion of the periphery of said carrier and running between said carrier and its driving-wheel, substantially as described and for the purpose set forth.

9. In a winding or taping machine, the combination with the annular carrier, of a series of supporting wheels peripherally disposed around and engaging said carrier, and a driving-belt extending over two of said wheels and between said wheels and the carrier and bearing against the periphery of the carrier, substantially as described and for the purpose set forth.

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