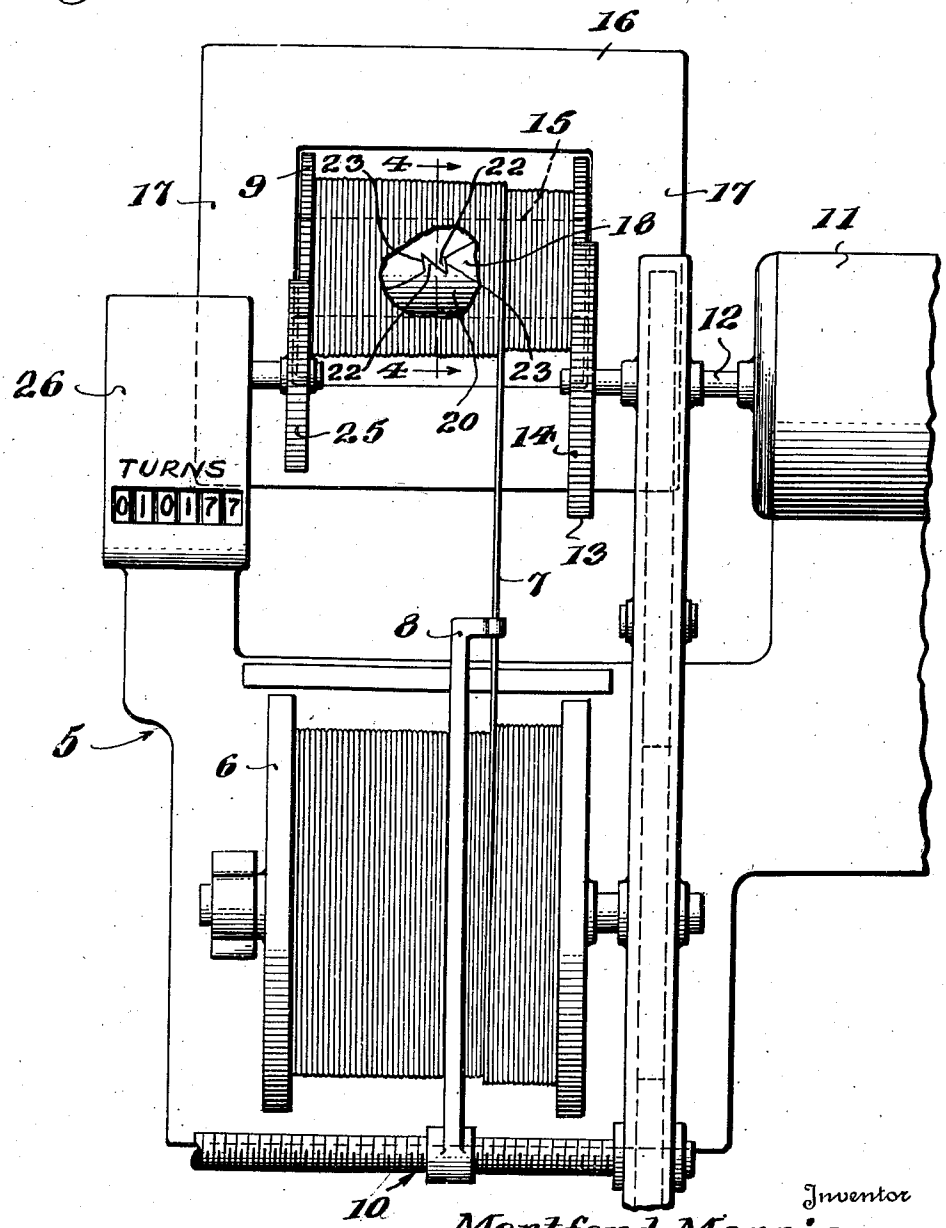
Jan. 9, 1945. M. MORRISON 2,366,977

WINDING AND REELING

Filed Aug. 9, 1943 2 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

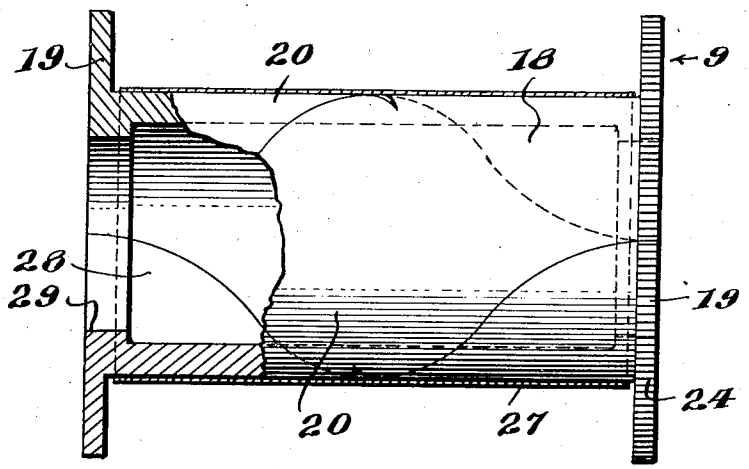


Fig. 3.

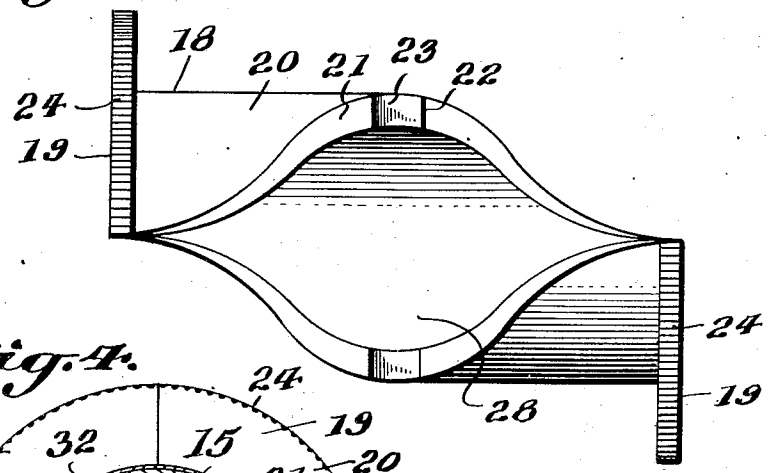


Fig. 4.

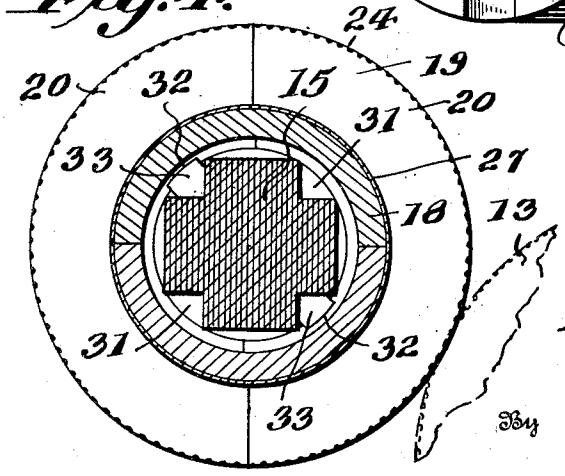




Fig. 5.

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Patented Jan. 9, 1945 2,366,977

UNITED STATES PATENT OFFICE

2,366,977

WINDING AND REELING

Montford Morrison, Upper Montclair, N. J.

Application August 9, 1943, Serial No. 497,935

5 Claims. (Cl. 242—4)

My invention relates to the art of winding and reeling and to the method whereby the coil wire of a coil unit may be machine-wound upon the coil form when the latter is mounted upon the leg of a closed magnetic core of a transformer-device or the like.

I am aware that various attempts have been made to provide means and methods for machine-winding a coil upon a transformer or the like, examples being illustrated in United States Patents Nos. 397,705 and 2,305,999. However, while these attempts may have, to a limited degree, advanced the art with respect to the hand-winding method, they still present many difficulties and disadvantages; for instance, the manner of constructing the coil form, means of holding the form sections or components together, means of effecting a driving relation between the form and a driving device, and providing the form with a proper bearing surface for engagement with the leg of the transformer core.

My invention overcomes the foregoing difficulties and presents numerous advantages over the art, it being one of the principal objects thereof to provide a coil form so constructed and arranged whereby the same may be expeditiously mounted upon the leg of a closed magnetic core of a transformer-device or the like and in a manner whereby said form may be rotated about the leg to effect winding of the coil wire thereon.

Another object of my invention is to provide a form of the foregoing described character having complementary components separable to effect mounting of the form upon the leg of a closed core.

A further object of my invention is to provide a form of the foregoing described character equipped with means for precluding relative shifting of the components during rotation.

A still further object of my invention is to provide a coil form of the foregoing described character equipped with means for securing the components in relative fixation when assembled and mounted upon the core.

A special object of my invention is to provide a coil form of the foregoing described character provided with means for effecting a positive driving connection with a driving device whereby the form is rotated for effecting winding of the coil wire thereon.

Another special object of my invention is to provide a coil winding organization wherein the wire receiving means or form becomes an integrant of the core upon termination of the wire-winding operation and which organization includes means for calculating the number of turns of wire fed upon the form.

An important object of my invention is to provide a form of the foregoing described character equipped with means for precluding rotation of the form upon termination of the wire-winding operation.

Another important object of my invention is to provide a method whereby coil forms may be readily assembled upon the leg of a closed magnetic core and coil wire machine-wound thereon in an expeditious manner.

A further important object of my invention is to provide a form of the foregoing described character which is simple in construction, efficient in use, economical in manufacture and which lends itself to quick assembly and high productivity.

With the above and other objects in view, as will hereinafter appear, the invention consists in the combination and arrangement of parts or components hereinafter set forth and illustrated in the accompanying drawings from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

Fig. 1 is a side elevation of a winding organization disposed in operative position with the core of a transformer-device.

Fig. 2 is a side view, partly in section, of the form.

Fig. 3 is a side elevation of one of the form components.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is a perspective view of one of the wedges.

In practicing my invention, as illustrated in the drawings, I provide a coil-winding organization 5 comprising a reel 6 containing a supply of coil wire 7, said organization 5 being equipped with a guide 8 for guiding the wire 7 onto a form or spool 9, and with the guide 8 constituting a part of a traversing mechanism 10. The traversing mechanism 10 is connected and operated by means of a motor 11 or other suitable source of power, said motor being equipped with the usual drive shaft 12 on which is mounted a drive wheel 13 having a serrated periphery or treated surface 14. As illustrated in Figs. 1 and 4 of the drawings, the form 9 is mounted upon the center leg 15 of the closed core 16 of a transformer-device or the like, said core 16 being of the shell type and provided with the usual outer legs 17. Inasmuch as the core is of ordinary construction and forms no part of the present invention per se, a more detailed description of same is not believed warranted.

The coil form or spool 9 is fashioned with a cylindrical portion 18 having ends provided with flanges 19 between which the coil wire is wound upon the portion 18 to form a coil unit. The form 9 comprises, in the present instance, a pair of complementary or replica components 20 having abutting faces 21 extending spirally or abaxially throughout the length of the form, and which faces are provided with dentents 22 and adjacent detent receiving slots 23 constituting

interlocking means with the adjacent component for precluding relative shifting of the components 20. The circumferential faces of the flanges 19 are provided with serrations constituting tread surfaces 24 wherein one of said surfaces is disposed in engagement with the drive wheel 13 whereby to effect a positive driving connection between the wheel 13 and the flange 19 during the winding of the wire upon the cylindrical portion. The tread surface 24 of the other flange 19 of the form 9 is disposed in driving relation with a driven wheel 25 comprising a part of a calculating device 26, the latter being of ordinary construction and operating to denote the number of turns of the wire upon the form 9.

When assembled upon the leg 15, the components or sections 20 of the form 9 are secured and maintained thereon by means of a strip of adhesive tape 27 or the like applied about the cylindrical portion 18 and upon which the wire 7 is wound. The form 9 is fashioned with a bore 28 through which the leg 15 extends, the peripheral face of the bore being disposed in spaciality with the faces of the leg. The peripheral face, adjacent the ends of the form, is provided with bearings 29, each having a running fit about the center leg 15. By extending the abutting faces 21 spirally, smooth rotation of the bearings upon the center leg and winding of the wire upon the form is effected and without the usual so-called "clicking" noise. The center leg 15 is of a cruciform configuration in cross section and with the branches defining channels 31 interjacent said branches. The peripheral faces of the bearings are provided with longitudinal slots 32 in which are inserted cuneiform members or wedges 33 which extend into registering channels 31 and thus preclude rotation of the form about the center leg upon termination of the wire-winding operation. Thus it will be apparent that the channels 31, slots 32 and members 33 constitute locking means for maintaining the form against rotation when said members 33 are applied thereto.

In operation, the components of the form 9 are assembled about the center leg 15 and secured in the assembled relation by applying the strip of adhesive tape 27 about the cylindrical portion 18. When the form is thus mounted upon the center leg, the core is adjusted with respect to the winding organization and in a manner to effect engagement of the drive and driven wheels 13 and 25 with the tread surfaces of the flanges of the core thereby effecting rotation of the form by the winding organization until the desired number of turns of the wire is obtained upon the form. Upon completion of the winding operation, the core is removed together with the core unit thus formed thereby establishing the core form as an integrant of the core. While in the present instance, the form is constructed of an insulating plastic material, it is to be understood that any other suitable material may be utilized when desired.

It is also to be understood that the language used herein and in the claims is intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, may be said to fall therebetween.

Without further elaboration the foregoing will so fully explain the invention that others may, by applying current knowledge, readily adapt the same for use under various conditions of service. Moreover, it is not indispensable that all the features of the invention be used conjointly since they may be employed advantageously in various combinations and subcombinations.

It is obvious that the invention is not confined to the herein described use therefore as it may be utilized for any purpose to which it is adaptable. It is therefore to be understood that the invention is not limited to the specific construction as illustrated and described as the same is only illustrative of the principles of operation, which are capable of extended application in various forms, and the invention comprehends all construction within the scope of the appended claims.

Having thus described my invention, what I claim is:

1. In a winding and reeling apparatus, a reel adapted to contain a supply of coil wire, means for rotating said reel to feed said wire therefrom, a form for receiving said wire and having a positive drive with said reel for rotating said form during the feeding of the wire, said form having separable components for assembly upon the leg of a closed core, means securing said components together when assembled on said leg, said reel being disengageable from the form to establish said form as an integrant of the core upon termination of the feeding of the wire.

2. In combination with a closed core of a transformer-device and of the type provided with a center leg having a cruciform cross-sectional area formed with branches defining longitudinally extending channels on its faces, a coil form having separable components for mounting upon said leg and provided with bearings for receiving said leg with at least one of said bearings formed with a slot for registry with one of the channels, means disposed within the slot and the respective registering channel for locking said form to said leg against rotation, and means applied about said components for maintaining the latter assembled about said leg.

3. In combination with a closed core of a transformer-device and of the type provided with a center leg having a cruciform cross-sectional area formed with branches defining longitudinally extending channels on its faces, a coil form having separable components for mounting upon said leg and provided with bearings for receiving said leg with at least one of said bearings formed with a slot for registry with one of the channels, and means disposed within the slot and the respective registering channel for locking said form to said leg against rotation.

4. In combination in a transformer-device, a closed core of magnetic material, a two-part hollow cylindrical headed coil form surrounding the magnetic circuit of said core and rotatable thereabout, said form having parting surfaces provided with intermeshing angular parts to prevent relative shift between the two parts of said form when said form is under external centripetal pressure, and mechanical means to provide said pressure.

5. In combination in a transformer-device, a closed core of magnetic material, a two-part hollow cylindrical headed coil form surrounding the magnetic circuit of said core, said form having parting surfaces provided with intermeshing angular parts to prevent relative shift between the two parts of said form when said form is under external centripetal pressure, mechanical means to provide said pressure, and means disposed between said core and said form to lock said form against rotation about said core.

MONTFORD MORRISON.

CERTIFICATE OF CORRECTION.

Patent No. 2,366,977. January 9, 1945.

MONTFORD MORRISON.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, second column, line 42, for "treated surface" read --tread surface--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 27th day of March, A. D. 1945.

Leslie Frazer

(Seal) Acting Commissioner of Patents.