(No Model.) 2 Sheets—Sheet 1.

R. HAASE & J. P. RECKER.

MACHINE FOR WINDING ARMATURES FOR MAGNETO ELECTRIC MACHINES.

No. 263,780. Patented Sept. 5, 1882.

Fig. 1.

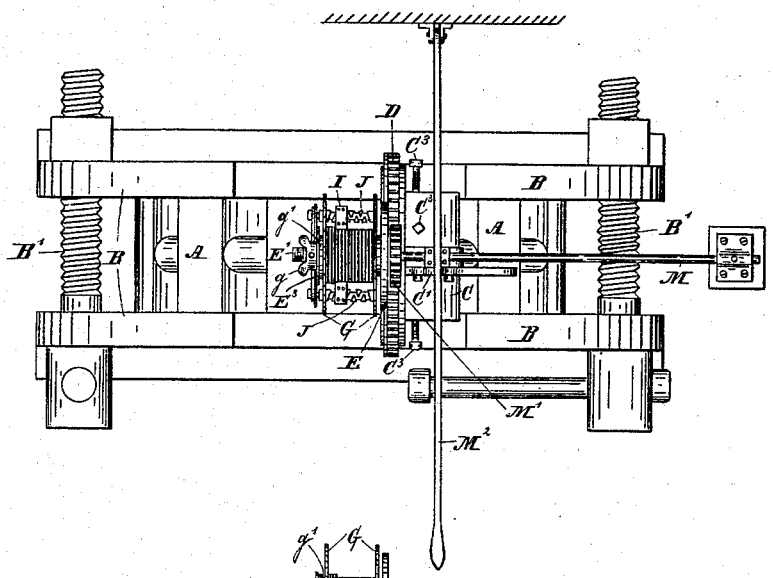
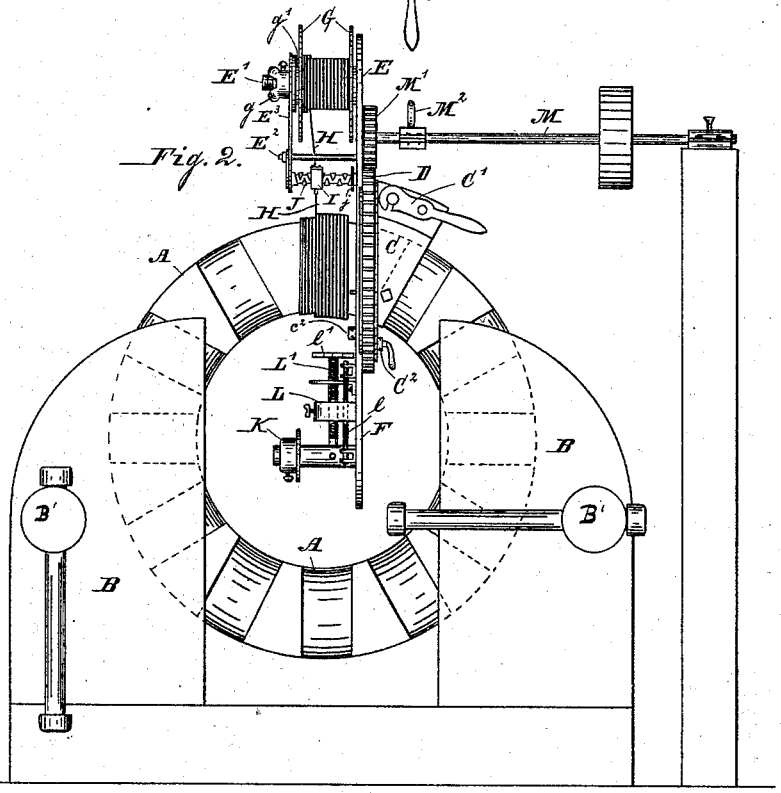


Fig. 2.



WITNESSES:

James B. Ligius.

R. P. Daggett.

INVENTORS:

Robert Haase,

and John P. Recker,

per C. G. Bradford,

their attorney.

(No Model.) 2 Sheets—Sheet 2.

R. HAASE & J. P. RECKER.

MACHINE FOR WINDING ARMATURES FOR MAGNETO ELECTRIC MACHINES.

No. 263,780. Patented Sept. 5, 1882.

Fig. 3.

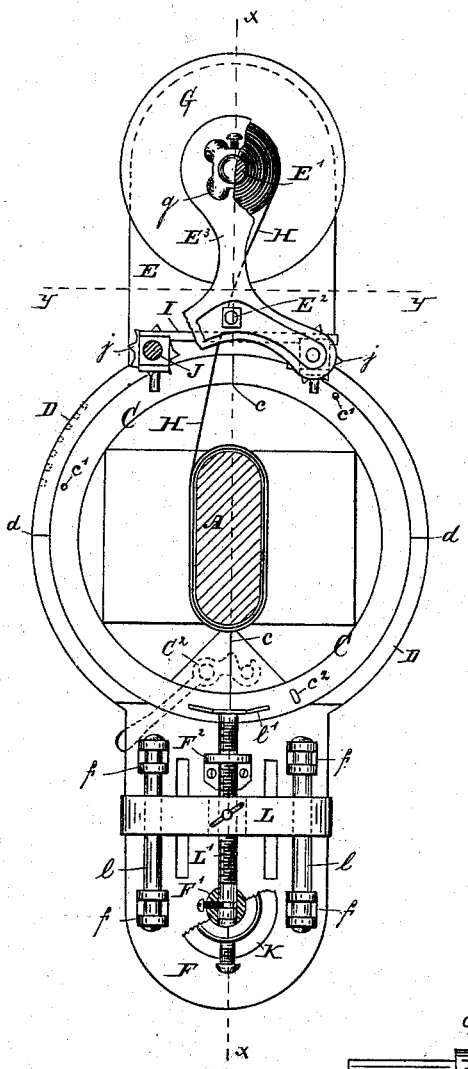


Fig. 4.

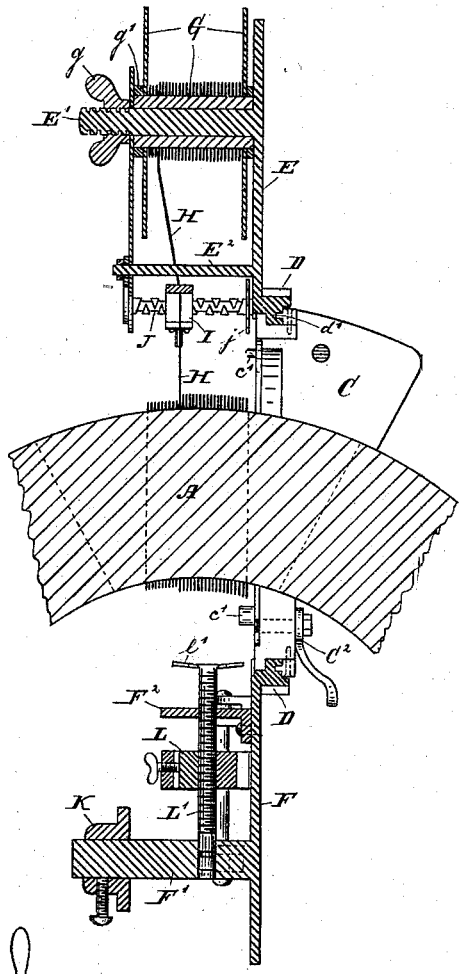
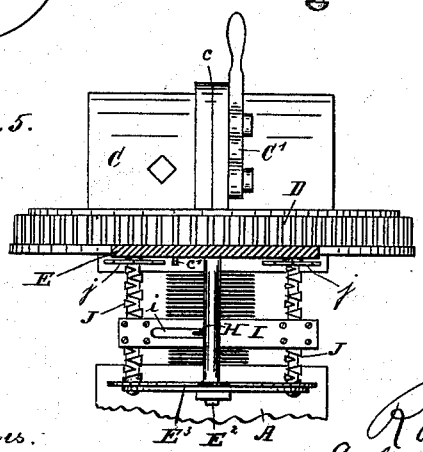


Fig. 5.



WITNESSES:
James B. Lyons.
R. P. Daggett.

INVENTORS:
Robert Haase,
and John P. Recker,
per C. Bradford,
their attorney

UNITED STATES PATENT OFFICE.

ROBERT HAASE AND JOHN P. RECKER, OF INDIANAPOLIS, INDIANA, ASSIGNORS TO THEMSELVES, AND THOMAS C. MOORE, JOSEPH A. MOORE, AND ROBERT CONNELLY, ALL OF SAME PLACE.

MACHINE FOR WINDING ARMATURES FOR MAGNETO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 263,780, dated September 5, 1882.

Application filed August 23, 1881. (No model.)

To all whom it may concern:

Be it known that we, ROBERT HAASE and JOHN P. RECKER, of the city of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Machines for Winding Armatures, of which the following is a specification.

The object of our said invention is to rapidly and compactly wind wire upon the rim of a circular armature by machinery.

The machine by which this object is accomplished consists of a clamp adapted to be securely fastened to and surround the rim of the armature, a rim adapted to surround and revolve upon the clamp, arms upon said rim, one of which carries a spool or bobbin containing the wire and the other a counterbalancing-weight, and fastening, guiding, controlling, and driving mechanism, all as will hereinafter be more specifically explained.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a top or plan view of a machine embodying our invention, as seen when applied to practical use winding an armature. Fig. 2 is a side elevation of the same. Fig. 3 is a detail elevation having certain portions broken away to show the operation of parts more clearly. Fig. 4 is a vertical section on the line *x x*, and Fig. 5 is a horizontal section, looking downwardly from the dotted line *y y*. Figs. 3, 4, and 5 are drawn on a scale double that used in Figs. 1 and 2.

In said drawings the portions marked A represent the armature which is being wound by the use of our machine; B, clamps by which the armature is secured rigidly in position during the process of winding; C, the clamp which forms part of our winding-machine secured to the armature; D, a cogged rim encircling said clamp; E F, arms projecting from said rim; G, a bobbin or spool secured to the arm E; H, the wire which is being wound from the bobbin to the armature; I, a traveling guide for said wire; J J, two endless screws upon which said guide is mounted, and by which it is driven; K L, counterbalancing-weights upon the arm F, and M a driving-shaft for the machine.

The armature A is formed like the rim of a wheel, with recesses to receive the wire. An armature, however, is no part of our invention, and we do not confine ourselves to this form, but expect to use our machine with any armature to which it is applicable.

The clamps B are simply stout jaws by which the armature is secured in place while being wound, and are preferably operated by screws B′.

The clamp C is composed of two parts which meet at the points *c*, and which are preferably secured together by the catches C′ C². It is formed with a preferably rectangular opening to fit the armature, but is circular in outside form, and is provided with a groove in which the toothed rim D runs. The toothed or cogged rim D is also composed of two parts which meet at the points *d*, and are secured to the clamp C by a flange-and-groove attachment, as shown. The flange *d′* has a small groove in one side, which interlocks with a corresponding small annular rib in the inside of the groove in the clamp C, and the rim D is thus secured in place. The groove forms the means by which the rim is guided in its course and the machine is steadied in position.

The arm E is rigidly secured to the rim D, and carries upon its face the studs E′ and E², which sustain a side-frame part, E³. The stud E′ also serves as a shaft for the spool G, and the stud E² as a rest over which the wire H passes.

The arm F is also rigidly secured to the rim D, and bears upon its face the studs and bearings F′ F² *f f f f*. The stud F′ carries the permanent weight K, and serves as a bearing for one end of the screw-shaft L′, by which the weight L is driven. The bearing F² serves to sustain the other end of the screw L′. The bearings *f f f f* sustain the slides *l l* on which the weight L′ travels.

The spool or bobbin G is an ordinary bobbin for carrying wire, and is mounted on the stud-shaft E′. It is prevented from turning too freely by the thumb-nut *g*, which presses

the frame part E^3 toward or against the bobbin. A washer, g', is usually interposed between the part E^3 and the bobbin to receive the wear occasioned by the friction of the bobbin in turning.

The wire H runs from the bobbin G onto the armature A as the winder revolves. It is guided to the proper point, so as to be wound compactly, by the traveling guide I and the stud or bar E^2.

The guide I runs upon the endless screws J J, and is driven thereby. It is provided with a slot, *i*, through which the wire runs. It consists simply of two boxes, each of which contains the ordinary pivoted flange forming a reversible screw-thread therefor, and a bar connecting them containing the said slot.

The screws J J are similar to other endless screws and are mounted in bearings in the arm E and in the frame part E^3. Upon the inner end of these screws are star-shaped wheels *j*, which as the winder revolves come in contact with the projections c' c' c^2, which turn said star-wheels and screws, and thereby advance the guide I slightly as often as said contact occurs. The number of points on the star-wheels, or projections with which they may come in contact, are increased or diminished as the wire is finer or coarser, so that each layer of wire shall be forced to lie close to the last, no matter what its diameter. As is usual in endless-screw mechanism, when the guide which travels thereon reaches one end it immediately starts on its return course, and therefore this machine will continue to compactly wind one course after another of wire upon the armature until the space therefor is entirely filled, when the winder is unclamped, by unfastening the catches c' and c^2, and moved to the next space, and finally removed altogether from the armature when all its spaces are filled.

The weight K is simply a portion of the weight which serves as a counter-balance for the bobbin G and the wire thereon, and may be of any convenient shape and any size which circumstances seem to require.

The weight L is mounted on slides *l l*, and has a screw-shaft, L′, passing through its center, which is journaled in bearings in the projecting parts F′ and F^2. The screw-shaft L′ has a star-wheel, l', upon its inner end, which strikes the projection c^2 as the winder revolves, thereby turning the screw and drawing the weight slightly inward with each revolution. The purpose of this is to keep the spool and wire exactly counterbalanced, so that the winder may be run rapidly and at the same time steadily, which could not be done if the two ends should be or become seriously out of balance.

The operation of our invention is as follows: The two parts of the winder are brought together, the clamps C surrounding the rim of the armature, and secured in position by the catches C′ C^2. The set-screws C^3 are then tightened up, which makes it perfectly rigid. A bobbin of wire is then placed upon the stud-shaft E′ and balanced by means of the weights K and L and the means of adjustment for the latter. The end of the wire is then passed through the slot *i* in the guide I and secured to the armature. Power is then applied to the driving-shaft M, either by a belt, crank, or otherwise, and operates through the gear-wheel M′, which engages with the toothed rim D to put the winder in motion. The various devices hereinbefore described cause the wire to be wound closely and evenly onto the armature. The machine is kept under the immediate control of the operator by means of the lever M^2, by which the inner end of the shaft can be lifted, and the wheel M′ thereby disengaged from the rim D. When one recess in the armature is properly filled with wire the screws C^3 are slackened, the catches C′ C^2 unfastened, the armature unclamped and brought into position, so that the next recess shall be vertically below the spool. When the winder is in proper position the clamps are again all properly secured and the former operation is repeated, and so on until all the recesses in the armature are properly filled with wire.

It is of importance that two endless screws should be employed, as one alone is unsteady and unreliable, besides being difficult to manage.

It is also of importance in fast winding that the counterbalance for the bobbin and wire should be and remain perfect, or nearly so, during the whole operation, as otherwise the machine would have a jerky and uncertain movement, and thus be liable to become disarranged or broken.

The winder, as a whole, being divisible, is as easily applied to an armature of annular form, or nearly so, as a common winder is to a straight one, and renders the winding of this sort of armature a much more easy and speedy task than heretofore, and also possesses the usual superiority of machine over hand winding in the matter of evenness and compactness.

Having thus fully described our said invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a machine for winding wire upon annular armatures, of the divisible clamp C, constructed substantially as specified, and adapted to surround and be secured upon the rim thereof, and mechanism, substantially as described, secured to and adapted to revolve upon said clamp, substantially as and for the purposes set forth.

2. The combination, in a machine for winding wire upon annular armatures, of the surrounding clamp, the toothed rim, the arms thereon, the bobbin, a traveling guide, and an endless-screw mechanism, substantially as and for the purposes set forth.

3. The combination, in a machine for winding armatures with wire in which one portion revolves upon another or stationary portion, of an endless screw or screws for driving a

traveling guide, a star-shaped wheel upon the end of each screw, and projections upon the stationary part of the machine, with which said star wheel or wheels will come in contact as the revolving portion of the machine moves past them, whereby said screws are revolved, the guide propelled, and the wire guided properly continually into place, substantially as set forth.

4. The combination, in a machine for winding annular armatures with wire, with the bobbin located upon one side of the center of the revolving portion of said machine, of a weight, L, upon the opposite side mounted upon a screw-shaft, L′, having a star-wheel, *l′*, upon its end, which comes in contact with points upon the stationary part of the machine as it revolves, whereby the position of the weight is continually varied to correspond to the decreasing weight of the wire, substantially as set forth.

5. The combination, in a winder adapted to revolve around the rim of an annular armature, of one arm carrying the bobbin for the wire, and another arm upon the opposite side carrying adjustable counterbalancing-weights, substantially as and for the purposes set forth.

6. The combination of the rim D, arm E, bobbin G, guide I, endless screws J J, having star-wheels *j j*, and stationary parts provided with projections *c′ c′*, substantially as and for the purposes set forth.

In witness whereof we have hereunto set our hands and seals at Indianapolis, Indiana, this 19th day of August, A. D. 1881.

ROBT. HAASE. [L. S.]
JOHN P. RECKER. [L. S.]

In presence of—
C. BRADFORD,
THOS. C. MOORE.