

(No Model.)

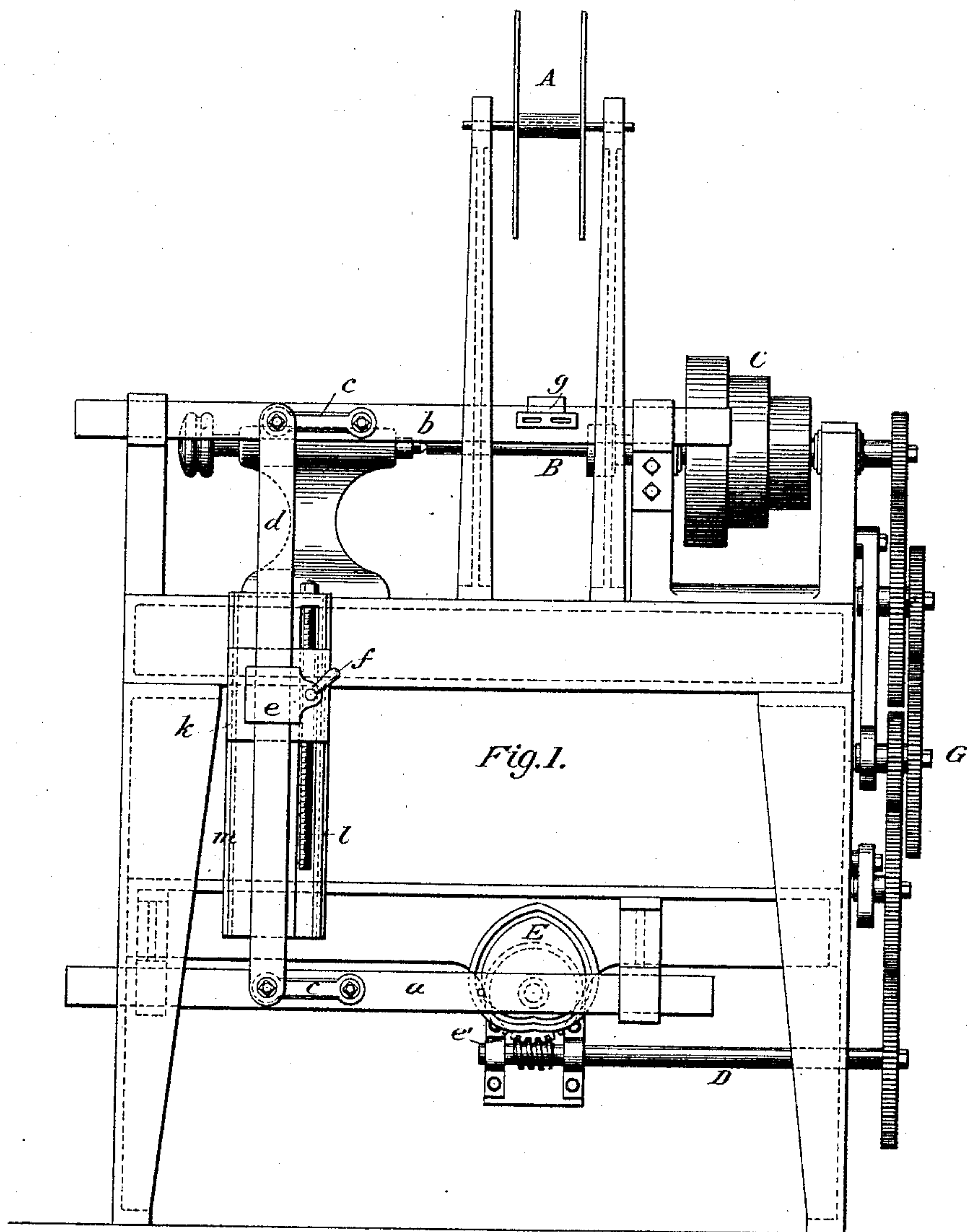
2 Sheets—Sheet 1.

H. C. SPALDING.

MACHINE FOR WINDING ELECTRO MAGNETS.

No. 327,470.

Patented Sept. 29, 1885.



Attest:

Raymond F. Barnes
W. Frisby

Inventor:

Henry C. Spalding
By Parker W. Page
att'y.

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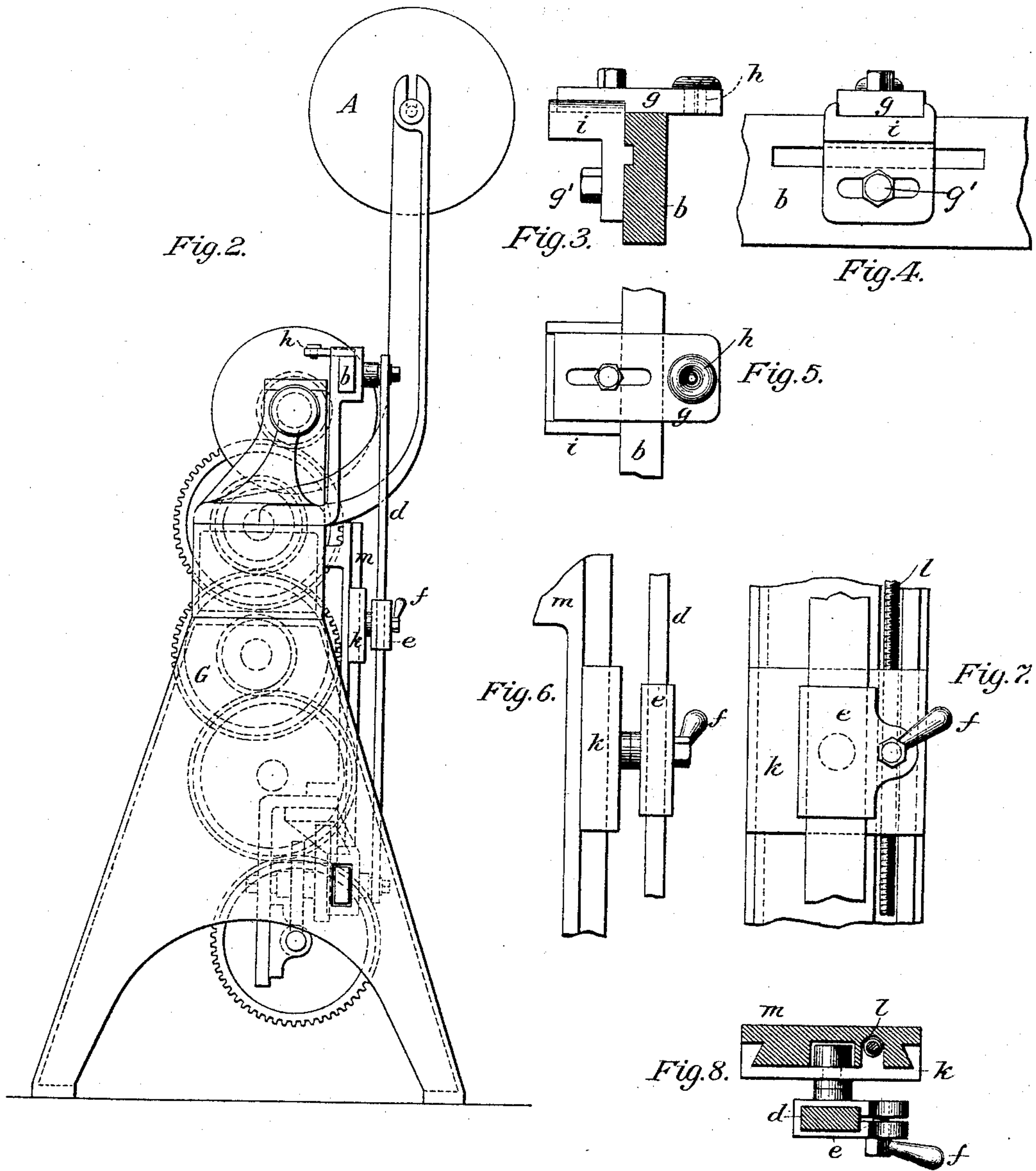
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UNITED STATES PATENT OFFICE.

HENRY C. SPALDING, OF BOSTON, MASSACHUSETTS.

MACHINE FOR WINDING ELECTRO-MAGNETS.

SPECIFICATION forming part of Letters Patent No. 327,470, dated September 29, 1885.

Application filed May 5, 1884. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. SPALDING, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machines for Winding Electro-Magnets, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

The object of my present invention is to produce an apparatus for automatically winding the bobbins or helices of electro-magnets, so that the winding of a number of bobbins may be effected simultaneously by different machines attended by one operator, and the coils or convolutions formed more evenly than by appliances now known and used. For this purpose I combine in co-operative relations, with means for delivering and winding the wire upon a core, devices for adjusting the same to varying lengths of core or bobbin, and devices for adapting it to the winding of wires of different sizes or diameters. The apparatus devised by me is illustrated in the accompanying drawings, in which—

Figure 1 is a rear view in elevation of the machine; Fig. 2, an end view of the same; Figs. 3, 4, and 5, details of a guide for the wire; and Figs. 6, 7, and 8, details of mechanism for effecting the requisite adjustments.

Similar letters of reference indicate corresponding parts.

The operative portions of the apparatus are preferably mounted on a frame similar to those used for lathes. A support on this frame carries the reel A, on which the wire to be used is wound. C is the pulley, by means of which the machine is driven; B, the core, of whatever kind it may be, around which the bobbin or helix is wound.

A system of gears, G, transmits motion from the main spindle to a shaft, D. These are ordinary variable gears, or, in other words, gears that may be replaced by others that occupy the same space but which vary the rate of rotation transmitted. On the shaft D is a worm that meshes with a gear-wheel, e', connected with a heart-cam, E. By this connection the cam is slowly revolved. In suitable guides on the frame of the machine is a

sliding bar, a, from which a pin extends into the slot of the cam.

Above or near the mandrel or core B is a second bar, b, the counterpart of the lower bar, a. The two are connected by links c c and the lever d. The latter passes through a clamp, e, to which it may be held by tightening the hand-nut f. The clamp is pivoted to a slide, k, made adjustable in guides or ways m by a screw, l. This pivot forms the fulcrum of the lever.

Secured to the bar b by a clamping-screw, g', passing through a slot, is a plate, i, which has a projection entering a groove in the bar b, as shown in Figs. 3 and 4. A slotted plate, g, is held by a screw to the upper edge of plate i, which is provided with a ledge to form a sufficient bearing-surface. The plate g extends over the bar b and carries at its end a removable bushing or guide, h. This device serves as a guide for the wire as it comes from the reel A, and lays it in proper manner around the core B. The manner of attachment to bar b of the guide permits it to be adjusted in position upon said bar, and the connection of plate g to plate i permits a transverse adjustment which may often prove necessary or desirable. The bushing h is removable and is changed for wires of different diameters.

The method of using and the operation of the machine are as follows: The fulcrum of lever d is first adjusted to impart a movement to bar b exactly equal to the length of the bobbin which it is desired to form. The proper size of pulley for the speed required is then selected, and gears G inserted that will impart the proper relative movement to the heart-cam and the guide g for the feed that the diameter of the wire to be wound requires. The wire is then passed through the bushing h and the winding started. The movement imparted by the heart-cam to the bar a, and from thence to bar b, carries the wire back and forth in exact proportion to the convolutions laid or wound. Coils, helices, or bobbins may in this manner be evenly, rapidly, and automatically wound, the only manual assistance required being in starting and stopping the machine. The latter may be readily effected automatically in many well-known ways.

The core B may be the solid core of an ordinary magnet, or the spool or shell of a helix, or any similar device upon which coils are usually formed.

5 What I claim is—

1. In a wire-winding mechanism, the combination, with the core or spool for receiving the wire, of a guide for directing the wire, means for varying the feed or relative movements of the core and guide, and means for
10 regulating or limiting the range of movement of the guide, all as set forth.

2. In a wire-winding mechanism, the combination, with the core or spool for receiving the wire, a guide for directing the wire, means
15 for varying the feed or relative movements of the core and guide, means for limiting the motion of the guide, and means for adjusting its position relatively to the core, all as set forth.

20 3. The combination, with the pulleys of va-

rying diameters, of a spool or core for receiving a coil of wire, a guide-bar and guide for the wires, means for reciprocating said bar, and means for varying or adjusting the range
of movement of the same, all as set forth. 25

4. The combination of the reciprocated bar *a*, the guide-bar *b*, connecting-lever *d*, links *c*, and an adjustable fulcrum for the lever, as set forth.

5. The combination, with the pulleys C and
core B, of the variable gears G, heart-cam E, guide *g*, and intermediate adjustable connections, substantially as herein set forth. 30

In testimony whereof I have hereunto set my hand this 26th day of April, 1884.

HENRY C. SPALDING.

Witnesses:

SANFORD H. DUDLEY,

ALEX. L. HAYES.