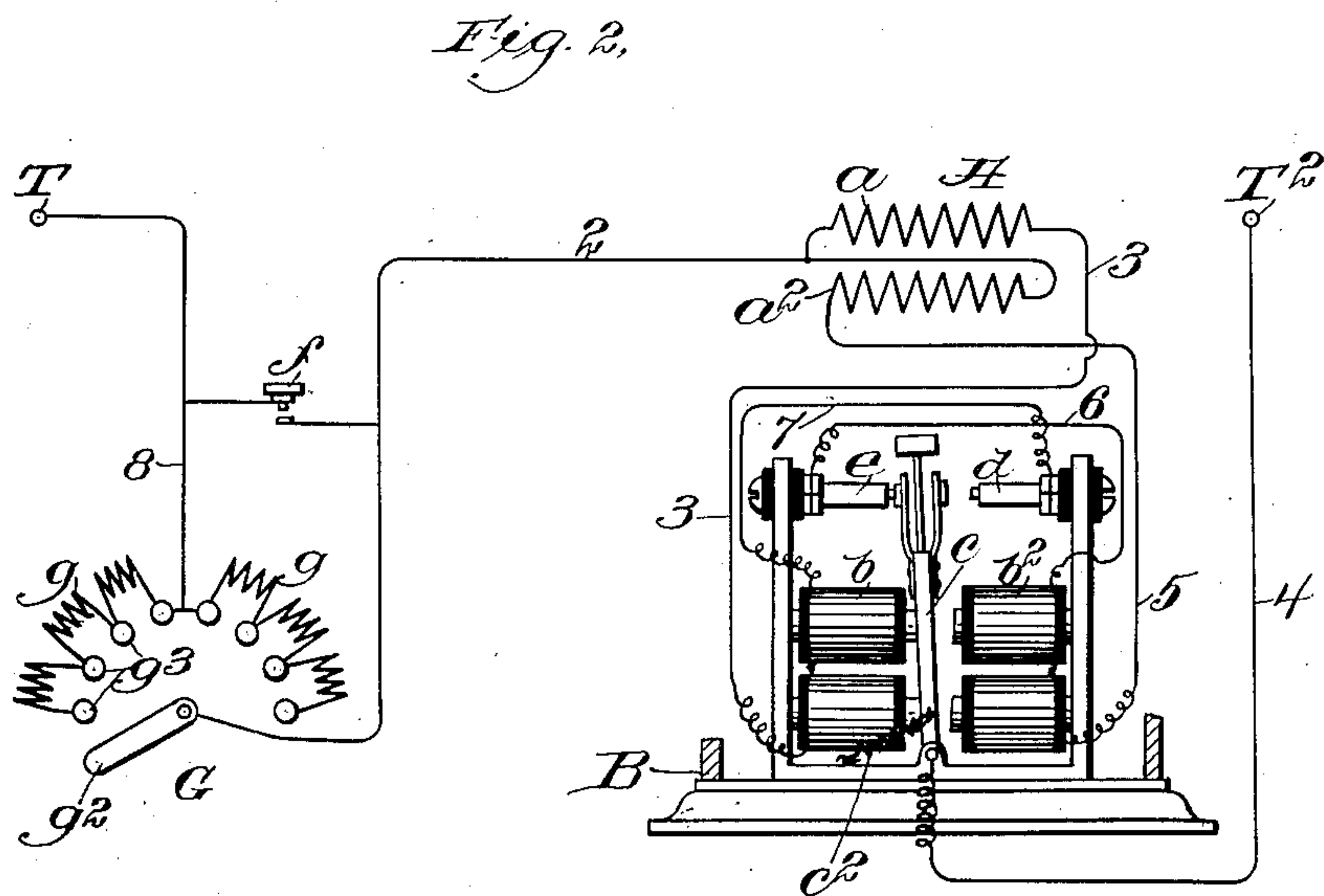
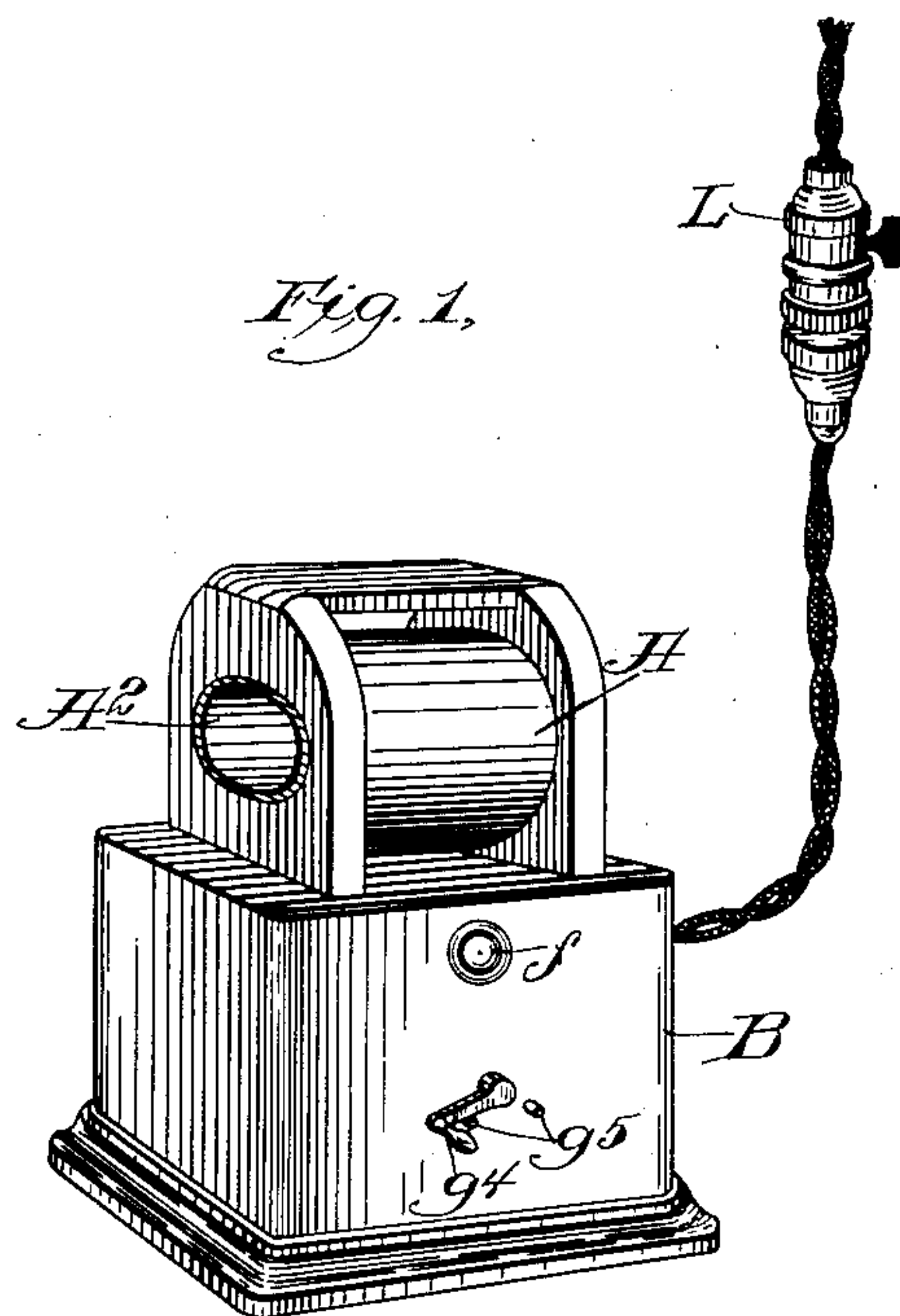


No. 855,158.

PATENTED MAY 28, 1907.

D. M. BLISS.  
DEMAGNETIZER.  
APPLICATION FILED MAR. 1, 1906.



Witnesses:  
Jas. J. Maloney.  
W. J. Conner.

Inventor:  
Donald M. Bliss,  
by J. P. and H. J. Sivermox  
Attys



# UNITED STATES PATENT OFFICE.

DONALD M. BLISS, OF NEW YORK, N. Y., ASSIGNOR TO ENGINEERING SPECIALTY COMPANY, A CORPORATION OF NEW YORK.

## DEMAGNETIZER.

No. 855,158.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed March 1, 1906; Serial No. 303,621.

*To all whom it may concern:*

Be it known that I, DONALD M. BLISS, a subject of the King of Great Britain, residing in New York, county of New York, and State of New York, have invented an Improvement in Demagnetizers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to a demagnetizer, and is embodied in an electrical instrument for demagnetizing small articles, being especially adapted for jewelers' use for demagnetizing watches.

The demagnetization is accomplished by placing the article to be demagnetized in a magnetic field produced by currents flowing alternately in opposite directions, and the purpose of the present invention is to provide the device with means for automatically producing such a magnetic field, it being practicable, moreover, in connection with the invention, to vary the strength of the current which produces the magnetic field during the operation of the device. For this purpose the device embodying the invention is provided with a solenoid of sufficient size to admit the insertion of the article to be demagnetized, the said solenoid having two windings to convey current in opposite directions, combined with means for alternately connecting said windings in circuit with a suitable source of current. The means for changing the connections are automatic, as will be hereinafter described, and the device may be set in operation by means of a simple switch or push button to close an electric circuit through the device, an additional feature of the invention, however, being embodied in the combination with the elements named, of a rheostat, so that the current used for demagnetizing is not only alternated in direction, but varied in strength.

Figure 1 is a perspective view of an instrument embodying the invention; and Fig. 2 is a diagram showing the circuit connections.

Referring to Fig. 1, the solenoid is contained in a casing A which is mounted upon a frame or support B, the said solenoid being so shaped as to afford an opening A<sup>2</sup> for the insertion of the article to be demagnetized, such, for example, as a watch. As indicated in Fig. 2, the solenoid is provided with

two windings  $a$ ,  $a^2$ , these windings being in opposite directions, and connected at opposite ends through a conductor 2 with one terminal T of a circuit from a suitable source of current, herein indicated as a lamp socket L. The opposite ends of the coils  $a$ ,  $a^2$  are arranged to be alternately connected with the other terminal T<sup>2</sup> of the source of current. In order that the coils may be consecutively energized so as to reverse the flow of current through the solenoid, electro-magnets  $b$ ,  $b^2$  are employed, and an armature  $c$  is arranged to cooperate with said electro magnets, and to constitute a circuit controller. The coil  $a$  is herein shown as connected through a conductor 3 with one terminal of the electro-magnet  $b$ , the opposite terminal of which is connected, through a conductor 7, with a contact member  $d$  which is arranged to be connected through the armature  $c$  and a conductor 4 with the terminal T<sup>2</sup> of the source of current. The armature  $c$ , however, is provided with a light spring  $c^2$  which maintains the said armature normally in contact with a contact member  $e$  to which current is conveyed through the conductor 5, electro-magnet  $b^2$  and conductor 6.

In the simplest form of the instrument, the main circuit from the terminal T to the terminal T<sup>2</sup> is closed by means of a push button  $f$ , the consequence being that current will flow from the terminal T through the conductor 2, coil  $a^2$ , conductor 5, electro magnet  $b^2$ , conductor 6, contact member  $e$ , armature  $c$  and conductor 4 to the terminal T<sup>2</sup>. This will energize the electro magnet  $b^2$ , attracting the armature  $c$  and closing a circuit through the coil  $a$  which may be traced as before, from the terminal T, through conductor 2, coil  $a$ , conductor 3, electro-magnet  $b$ , conductor 7; contact-member  $d$ , armature  $c$ , and conductor 4, to the terminal T<sup>2</sup>. This energizes the electro-magnet  $b$  and causes the armature to be attracted thereby, and restored to its original position, it being obvious, therefore, that so long as current is flowing through the instrument, the armature  $c$  will vibrate, causing current to flow alternately in opposite directions through the solenoid A.

In the simple form of the instrument above described, the effective strength of the current acting on the article to be demagnetized may be varied by slowly changing the position of the article, (a watch, for example)



with relation to the solenoid, that is to say, by gradually inserting the watch and gradually withdrawing it. It is practicable, however, to provide the instrument with means for producing the desired variation in the current, so that the watch, or other article, can simply be placed in the solenoid and left there during the operation of the instrument. For this purpose, the instrument may be provided with a rheostat G, herein shown as provided with three resistance coils  $g$  at opposite sides of the main connection through the conductor 8 with the terminal T, a rotating or oscillating switch arm  $g^2$  adapted to travel consecutively over contacts  $g^3$  being shown as provided at the outside of the casing with a crank handle  $g^4$ . The switch arm  $g^2$  is connected with the conductor 2, so that the circuits heretofore traced may be controlled by operating the rheostat, it being obvious, however, that, in moving the rheostat arm the entire length provided for by the stops  $g^5$  (Fig. 1) the current will be gradually increased, and then gradually decreased. It is obvious that the stops  $g^5$  may be omitted and the crank handle  $g^4$  revolved, if desired, the oscillating movement provided for, however, being fully as convenient.

From the foregoing description it will be seen that the instrument is substantially automatic, it being practicable to regulate the speed of variation in the direction of the current in accordance with the inertia of the armature  $c$ . This has the advantage over a mechanically operated device that the speed of the alternations is beyond the control of the operator, being dependent upon the primary adjustment of the instrument itself.

It is to be understood that the instrument may be provided with both the push-button  $f$  and the rheostat G, as shown, although either one may be employed alone, the advantage above described over the mechanically operated device being equally true when the rheostat is employed, for the reason that the different manipulations of the rheostat will only vary the speed of changing the strength of the current without affecting the time of the alternations in direction. It is to be further noted that the frame or support B also constitutes an inclosing case for the electro-magnets, armature, contacts, etc., so that the instrument is neat in appearance, compact, and protected as to the working parts, from dust and moisture. Furthermore, as shown in Fig. 1, the solenoid coils are also completely inclosed and protected.

What I claim is:

1. In a demagnetizer, a solenoid having two windings in opposite directions; and means for alternately connecting the said windings in circuit from a suitable source of current, whereby the direction of flow of current through the solenoid is reversed at intervals.

2. In a demagnetizer, a solenoid having two reversely wound coils; and an electromagnetic device for alternately connecting said coils in circuit with a suitable source of current.

3. A demagnetizer having a solenoid provided with coils reversely wound; an electro-magnet in circuit with each coil; and a switch controlled by said electro magnets for electrically connecting said coils in circuit with a suitable source of current.

4. In a demagnetizer, the combination with a solenoid provided with reversely wound coils; of an electro magnet in circuit with each coil; a vibrating armature located in the magnetic field of both electro magnets; a circuit closer for closing said circuit through one electro magnet when said armature is attracted by the other; and means for controlling the main circuit through the instrument.

5. In a demagnetizer, the combination with a solenoid having reversely wound coils; of an electro magnetic switch for alternately connecting said coils in circuit with a suitable source of current; and a manually operated circuit closer for closing the circuit through said demagnetizer.

6. In a demagnetizer, the combination with a solenoid having reverse windings; of a circuit for each winding; an electro-magnetic device for alternately closing said circuits; and a rheostat to control the main circuit through the instrument, whereby the strength of the current is gradually varied.

7. In a demagnetizer, the combination with an inclosed solenoid having reverse windings; of a circuit for each winding; an electro-magnetic device for alternately controlling said circuits; and an inclosing case for said electro-magnetic device, said case also constituting a support for the solenoid.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

DONALD M. BLISS.

Witnesses:

W. E. COVENEY,  
H. J. LIVERMORE.