

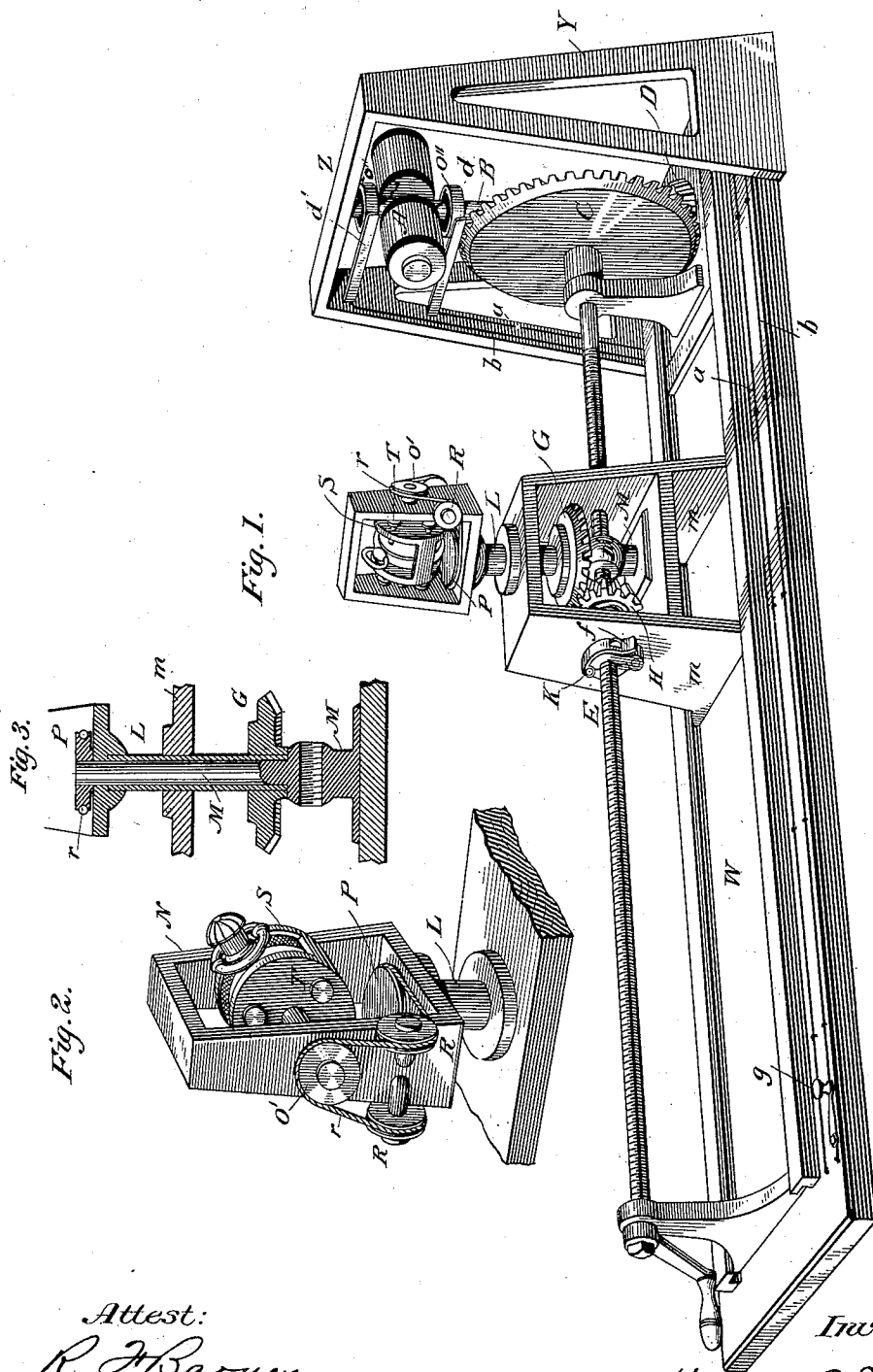
(No Model.)

H. S. MAXIM.

METHOD OF AND APPARATUS FOR DEMAGNETIZING WATCHES.

No. 250,273.

Patented Nov. 29, 1881.



Attest:  
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# UNITED STATES PATENT OFFICE.

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## METHOD OF AND APPARATUS FOR DEMAGNETIZING WATCHES.

SPECIFICATION forming part of Letters Patent No. 250,273, dated November 29, 1881.

Application filed September 7, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, HIRAM S. MAXIM, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in the Method of and Apparatus for Demagnetizing Watches or other articles of or containing steel, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

My invention is specially designed for the demagnetization of steel watch-springs; but its application may be extended to the neutralization of the magnetism often acquired by other small articles—such as tools and small implements of steel.

Broadly stated, the invention consists in exposing the articles to be demagnetized to a rapidly alternating magnetic attraction under conditions that cause a gradually diminishing attractive influence to be exerted upon them, as by increasing the distance between the article and the magnet, or by gradually reducing the strength of the magnet itself.

The devices employed by me for the purpose of effecting the above-stated objects, and which embody my invention in one of the many forms in which it is capable of being carried out, are illustrated in the accompanying drawings, in which—

Figure 1 is a view, in perspective, of the device; and Fig. 2, a perspective of a portion thereof enlarged, for the purpose of better illustration. Fig. 3 is a sectional view of details of mechanism.

Similar letters of reference designate corresponding parts in the two figures.

W designates a bed-piece, having fixed uprights Y at one end, which form a frame, Y Z. In this frame, and mounted on a vertical spindle, B, is a powerful bar or electro-magnet, A, arranged to revolve endwise in a horizontal plane.

The letters O' O'' indicate metal rings or collars, insulated from each other and the spindle, and forming the circuit terminals of the coils of magnet A. Fixed to the side of the frame, and bearing on these collars, are contact-strips d d', to which the current is or may be conveyed by wires a b from a battery or dynamo-machine, g being a manual switch for di-

recting the current through the wires at will. When, therefore, the circuit through wires a b is closed, the magnet A will be energized, exerting a magnetic attraction of opposite polarity at its ends.

E is a screw-shaft, journaled in suitable standards, for imparting motion to the spindle B. It is provided at one end with a crank, and at the other with a bevel-wheel meshing with a beveled pinion on the spindle.

A traveling frame or carriage, m m, is arranged to slide in ways on the bed-piece W. It is moved to and from the magnets by the rotation of shaft E, from which it receives its motion, by means of a clamp, K, screw-threaded on its inner faces to fit the thread of shaft E, and fastened to frame m.

The holder S for the watch or other article to be demagnetized is mounted on a frame, N, carried by a hollow vertical spindle, L, to the lower end of which is fixed a bevel-wheel, G, meshing with a pinion, H, carried by the frame m, but rotated by the screw-rod E, the latter being slotted, and the pinion being splined for this purpose.

M is a shaft secured to the bottom of the carriage N, and passing up through the hollow spindle L to the frame N, where it ends in a circular grooved head, P. The screw-rod E passes freely through an enlargement, m', in the shaft or post M, the shaft above said enlargement being of reduced diameter, as shown in the section view, Fig. 3.

R R are pulley-wheels mounted on the frame N, and O' a similar pulley fixed to the shaft of the holder S. A cord, r, passes around all the pulleys and the grooved head P.

The operation of the device is as follows: The carriage is moved up close to the magnet-frame Y by turning the screw E, or by opening the hinged clamp K and sliding the carriage along. The carriage is then geared to the screw E by the clamp or shear nut, which has a clasp, f, and a watch or other article upon which it is desired to operate, secured by the screws T in the holder S. The current being then directed through the magnets A, the screw is turned to draw the carriage away from their influence. This causes the hollow spindle L to rotate, and since the head P is stationary, rotary motion is imparted by cord r to the pulley O'. The

article confined by the holder S will thus be moved in three directions, so that it will be presented in all positions to the influence of the alternating attraction of the magnets, while at the same time it is being withdrawn gradually from them. By thus subjecting magnetized articles of steel to rapid reversals of polarity in a magnetic field which is gradually weakened until all traces of attractive influence are removed I have found that a complete demagnetization may be effected.

In the above I have shown mechanical devices for removing the articles under treatment beyond the influence of the magnets. This forms a convenient and economical means of effecting the desired result, and permits the use of permanent magnets instead of the electro-magnets described; but as the use of the former is open to many serious objections under the prescribed conditions, I prefer to employ large and powerful electro-magnets.

It is obvious that instead of withdrawing the article from the neighborhood of the magnets, they may be kept in one position and the attractive power of the magnets gradually reduced by reducing the volume of the energizing current or by inserting in the circuit artificial resistance. I desire it to be understood, therefore, that, without restricting myself to the means described for carrying out my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The method of demagnetizing watches or other similar articles of or containing steel, which consists in subjecting the same to rapid reversals of polarity in a gradually-weakened magnetic field, substantially as described.

2. The method of demagnetizing watches or other articles of or containing steel, which consists in gradually withdrawing them from the influence of a rapidly-alternating magnetic attraction, as set forth.

3. In an apparatus for the demagnetization of watches or other articles, the combination, with an electro-magnet and means for revolving the same, of a rotary holder for presenting the articles under treatment to the influence of said magnets, and mechanism, as described, for withdrawing them from the magnets, substantially as described.

4. In an apparatus for the demagnetization of watches or other articles, as described, the combination, with the revolving magnet, of a movable frame or carriage, a holder for the watch mounted thereon, and means for rotating the holder simultaneously in horizontal and vertical planes, as and for the purposes specified.

In testimony whereof I have hereunto affixed my signature this 12th day of August, 1881.

HIRAM S. MAXIM.

Witnesses:

W. FRISBY,  
PARKER W. PAGE.