No. 711,182. Patented Oct. 14, 1902.

H. SHOEMAKER.

SIGNALING SYSTEM.

(Application filed Sept. 5, 1902.)

(No Model.)

Fig 1.

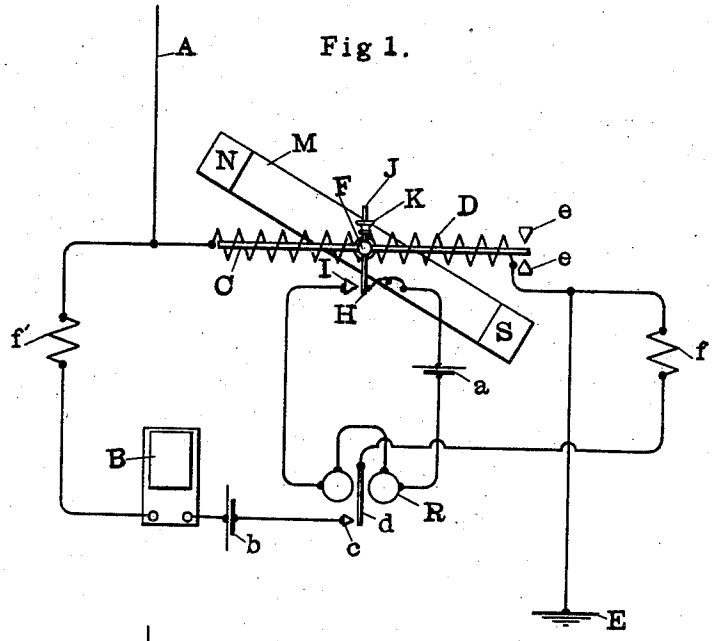
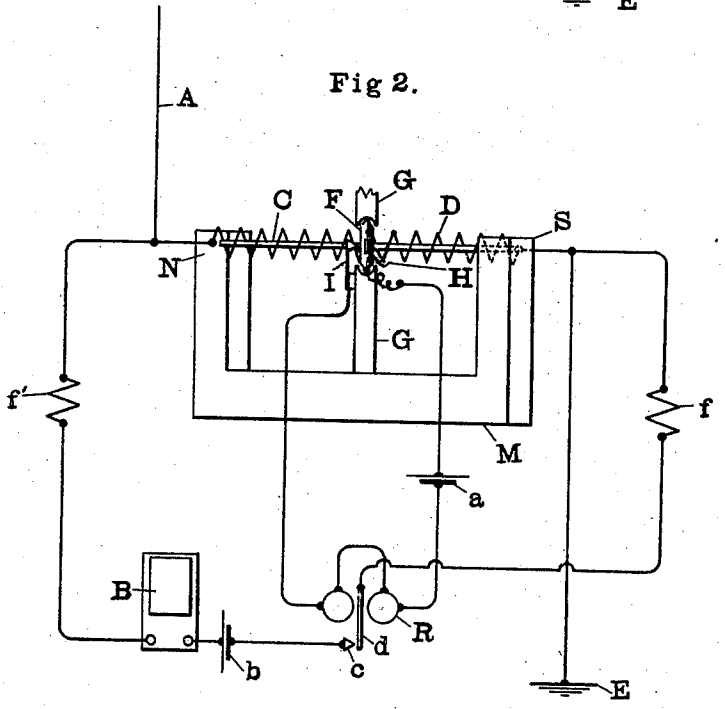


Fig 2.



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SIGNALING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 711,182, dated October 14, 1902.

Application filed September 5, 1902. Serial No. 122,176. (No model.)

To all whom it may concern:

Be it known that I, HARRY SHOEMAKER, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and useful Signaling System, of which the following is a specification.

My invention relates to electrical signaling systems in which the energy representing the message or signals is transmitted through the natural media, such energy being of the electroradiant type.

My invention relates to a wireless signaling system wherein high-frequency oscillations at the transmitter cause the radiation therefrom of electroradiant energy which influences and controls the apparatus at the receiving-station.

My invention relates more specifically to improvements at the receiving-stations of a wireless signaling system, whereby the received electroradiant energy is caused to control local circuits to produce signals or messages.

My invention comprises a receiver of a wireless signaling system in which the received radiant energy is caused to influence the magnetism existing in a magnetic mass, causing it to be moved to control local circuits.

My invention comprises means whereby electroradiant energy is caused to demagnetize a normally magnetized mass, thereby releasing it to the control of a magnetic field and resulting in the opening or closure of a local circuit or circuits for producing electrical signals.

My invention comprises means for demagnetizing a magnetized rod or needle or bundle of needles pivoted very delicately in the field of a permanent magnet or electromagnet and surrounded by a winding through which pass oscillatory currents generated in the receiving-conductor by the received electroradiations. These oscillations, as is well known, demagnetize wholly or in part the pivoted member, which is then controlled by the field in which it is located and rotates slightly upon its jeweled bearings and in so doing controls a circuit or circuits which produce a signal and also again magnetize the pivoted member preparatory to receiving a further code character in the form of a train of oscillations.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a diagrammatic view showing the moving magnetized member and the permanent magnet producing the field in plan view. Fig. 2 is the same as Fig. 1, except that the permanent magnet and the pivoted member are shown in side elevation.

In Fig. 1, A represents the usual aerial conductor at the receiving-station of a wireless signaling system, and E represents the usual earth connection. Connected in series between A and E is the winding D, surrounding but not interfering with the motion of the needle C, which is composed, preferably, of a small bundle of very fine steel wires. The member C is pivoted by means of a vertical pivot F, as shown in Fig. 2, in jewel bearings G G. Extending from the pivot-pin F and at approximately right angles to the axis of member C is the member H. The member H extends rearwardly to the screw-threaded member J, upon which is the counterpoise-weight K, which by rotary motion is adjusted along the screw-threaded member J.

e e are stops which limit the rotary motion of the member C.

I is a contact which coöperates with the member H to close the local circuit including source of energy *a* and the relay R.

M is a permanent magnet whose poles are represented, respectively, by N S. The line joining the centers of the poles N S forms an acute angle with the member C, as clearly shown in Fig. 1, and passes through the pivotal support F. In place of the permanent magnet M may be used, of course, an electromagnet. The winding D is common also to the circuit including choke-coil *f*, relay-tongue *j*, relay-contact *c*, source of energy *b*, recorder B, and choke-coil *f'*.

The method of operation is as follows: When electroradiant energy impinges upon

the aerial conductor A, there are set up in the circuit A D E oscillations which then demagnetize the permanently-magnetized member C. The member C is so magnetized that its left end is a north pole and its right end a south pole. In consequence normally there is a repulsion between the poles of the member C of the permanent magnet M. This causes, then, the right-hand end of the member C to be in contact with the upper stop *e*. Upon demagnetization, however, due to the received oscillations, the member C becomes neutral and is then attracted by the magnet M and immediately rotates upon its pivotal support, and in consequence of this rotation the member H comes into contact with I, closing the circuit of the relay R. This relay then closes the circuit at contacts *c d*, producing a record, either audible or visible, in the recorder B and at the same time passes a current through the solenoid or winding D in such direction as to so remagnetize the member C that it will be repelled by the magnet M. The apparatus is then in condition for the reception of the next train of oscillations.

It is to be understood that the member C may be opposed during its period of repulsion by the magnet M—that is, just before receiving oscillations—by a spring, so that upon demagnetization, which need not in such case be entire or complete demagnetization, the spring will cause the rotation of member C upon its pivotal support to close the circuit H I. In fact, this is the preferred arrangement.

It is to be understood that instead of magnetizing the member C by means of the winding D, through which oscillations are received, a separate winding may be employed, which should be controlled by relay R at the proper moment. This would be perfectly apparent to one skilled in this art.

The flexible connection to the member H may and is preferably through the pivot-pin F, because of the very slight motion of the periphery of such pin. Such flexible connections may be made by a very fine helical conductor or by means of a very fine weak flat spiral hair-spring, as is common in galvanometer instruments.

From the foregoing description it is apparent that by the use of a magnetic field in the vicinity of the magnetized needle I am enabled to produce a motion of the member C with even the weak effect of received oscillations, and therefore my system is more effective for long-distance signals than heretofore possible with demagnetizing systems.

What I claim is—

1. In a wireless signaling system, a magnetic field, a normally magnetized member in said field, means for demagnetizing said member by the effect of received electroradiant energy, and means for producing a signal due to the motion of said member in said magnetic field.

2. In a wireless signaling system a field of force, a normally magnetized member supported in and capable of rotation in said field of force, means for changing the normal magnetism of said member by the effect of received oscillations, and a local circuit controlled by said member.

3. In a wireless signaling system, a field of force, a normally magnetized member supported and rotatable in said field of force, a winding for demagnetizing said member by the effect of received oscillations, a local circuit controlled by said member for producing a signal and for restoring said member to its normal magnetic condition.

4. In a wireless signaling system, a magnetic field, a normally magnetized member delicately pivoted in said field, a winding for demagnetizing said member by the effect of received oscillations, a local circuit controlled by said member, and a recording device in series with said winding.

5. In a wireless signaling system, a receiving-conductor, a magnetic field, a normally magnetized member supported and movable in said field and under the influence of a winding, a local circuit controlled by said member and a recorder in series with said winding and a source of energy.

6. In a wireless signaling system, a magnetic field, a normally magnetized member supported and movable in said field, a winding for demagnetizing said member under the influence of received energy, a relay-circuit controlled by said member, and a circuit including a source of energy, a recorder and said winding, controlled by said relay.

7. In a wireless signaling system, a normally magnetized member capable of movement, means for demagnetizing said member by the effect of received oscillations, and a local circuit controlled by said member.

8. In a wireless signaling system, means for maintaining a magnetic field, a normally magnetized member supported and movable in said field, a local circuit controlled by said member, and means for changing the degree of magnetization of said member.

9. In a wireless signaling system, means for maintaining a magnetic field, a normally magnetized member movable in said field and repelled thereby, means for changing the repulsive force by received energy, and a local circuit controlled by said member.

10. In a wireless signaling system, means for maintaining a magnetic field, a normally magnetized member supported in and repelled by said magnetic field, means for demagnetizing said member by the effect of received electroradiant energy, and means for producing a signal by the resultant motion of said member.

11. In a wireless signaling system, a normally magnetized member delicately pivoted, means for demagnetizing said member by the

effect of received electroradiant energy, a magnet normally repelling said member, and a local circuit controlled by said member.

12. In a wireless signaling system, a normally magnetized member, means for maintaining a magnetic field about said member, said member located in said field in a manner to be normally repelled thereby, a winding for demagnetizing said member by the effect of the received energy, and a local circuit controlled in virtue of the decreased repulsive force.

HARRY SHOEMAKER.

Witnesses:
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