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J. A. FLEMING.

TELEGRAPHIC SIGNALING KEY.

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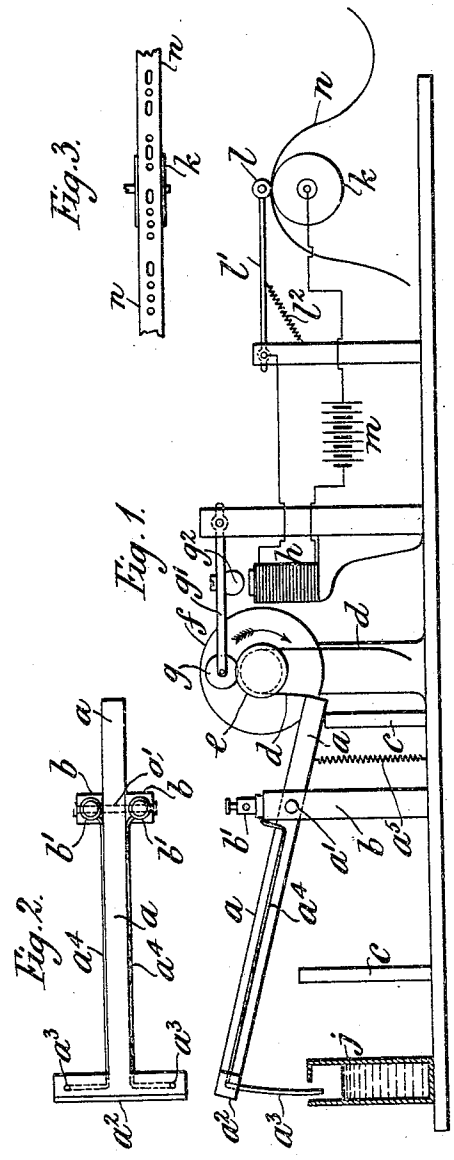

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No. 792,015. Patented June 13, 1905.

UNITED STATES PATENT OFFICE.

JOHN AMBROSE FLEMING, OF UNIVERSITY COLLEGE, LONDON, ENGLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MARCONI WIRELESS TELEGRAPH COMPANY OF AMERICA, A CORPORATION OF NEW JERSEY.

TELEGRAPHIC SIGNALING-KEY.

SPECIFICATION forming part of Letters Patent No. 792,015, dated June 13, 1905.

Application filed September 7, 1904. Serial No. 223,618.

To all whom it may concern:

Be it known that I, JOHN AMBROSE FLEMING, doctor of science, a subject of the King of Great Britain, residing at University College, Gower street, London, England, have invented certain new and useful Improvements in Telegraphic Signaling-Keys, of which the following is a specification.

This invention has for its object the production of a novel and exceedingly-efficient form of telegraphic signaling apparatus which may be advantageously employed in connection with wireless telegraphy.

The improvements consist in the employment of a movable circuit closer and breaker, a motor for putting the same into action, and a transmitting apparatus, which causes the motor to become effective for the purpose stated.

The form of apparatus shown in the accompanying drawings and hereinafter especially described comprises a pivoted lever, carrying circuit-terminals, a constantly-moving motor, and a transmitting instrument and connections which cause the motor to be coupled with and operate the lever as desired. As shown in the drawings, the lever may itself constitute the signaling-key, and a band attached to the key passes loosely over a pulley driven by a fast-running motor. On the top of this tape rests a jockey-pulley carried on the end of a lever which forms part of the armature of an electromagnet. When the current is sent into this magnet, it attracts this armature and presses the jockey-pulley down upon the tape, which thereupon is gripped against the pulley of the motor, and the motor winds up the tape, thereby depressing the signaling-key. The electromagnet is set into operation in accordance with the signals of the Morse alphabet in the following manner: A strip of paper, like telegraph-tape, is punched with a message in the Morse alphabet, the dots being represented by small holes in the paper and the dashes by small slits. This paper is made to travel over a metal pulley by means of a clockwork arrangement similar to that of a Morse printing instrument. On the strip of paper there rests a small wheel or finger, which as the paper travels underneath it drops through the holes or slits and makes electrical contact with the metal pulley. This contact closes the circuit of the electromagnet and a battery contained in series therewith, and thus the magnet is energized in accordance with the Morse signals punched into the paper.

Figure 1 is an elevation of a circuit-closer suitable for wireless telegraphy in which it is desirable to give a long and rapid travel to the contacts, and Figs. 2 and 3 are part plan views.

a is a light wooden bar which should be as light and stiff as possible. A piece of thin bamboo answers the purpose very well. This rod works on a steel axis a', fixed to an upright or between two uprights b. One end of this rod carries a cross-piece a^2, to which two or more curved steel pins a^3 are attached, and from the ends of these insulated wires a^4 are brought back along the rod a to the two terminals b' on the uprights b. The rod a is held tilted up by means of a spring a^5 and restrained by means of pillars or stock-posts c. To one end of the rod a is attached a tape or band d, which passes over the pulley e of a fast-running electric motor f, rotating in the direction shown by the arrow. This tape hangs loose over the pulley and is not gripped by the pulley until a jockey-pulley g presses down upon it. This jockey-pulley is carried at the extremity of a light metal arm g', which carries a soft-iron armature g^2, held in apposition to the pole of an electromagnet h. When this magnet is energized, it attracts the armature g^2 and causes the jockey-pulley g to press the tape d down upon the rotating pulley e, which thereupon winds up the tape and pulls down the long arm of the lever a; but immediately the magnet ceases to be magnetized the lever a flies up again, being pulled by the spring a^5. The operation of depressing the lever a causes the steel pins a^3 to be immersed in mercury contained in a glass or ebonite vessel j and in this manner connects together the two pins or two sets of pins carried by the cross-bar. The

magnet h is energized in the following manner: A wheel k is driven round slowly by clockwork, and against it rests a small wheel l, carried by a lever l', which is gently pressed down by a spring l^2. This lever is connected to a battery m in circuit with the electromagnet h, and the circuit is completed through the wheel k. Hence when the wheels k and l are in contact the magnet is energized; but if they are separated it is not energized. Between the wheels k and l is drawn by the revolution of the wheel k a strip of Morse paper n, Fig. 3, which has been punched with telegraphic signals, the dot being a round hole and the dash a slit. As this paper is drawn underneath the wheel l, which wheel should have a platinum edge, it drops through the holes in the paper and completes the circuit of the electromagnet in accordance with the nature of the holes punched in the paper.

Upon examination of the drawings it will be obvious that the contacts a^3 may be connected in any desired way, preferably through the binding-posts b', with the wires of the telegraph apparatus. For instance, said contacts may be directly or inductively connected with spark-balls or other means for producing electromagnetic waves.

What I claim is—

1. In a signaling apparatus, a movable circuit closer and breaker comprising a lever mounted to oscillate, a continuously-operating motor, means comprising a flexible connecting member for connecting said motor to said lever and a transmitting instrument controlling the coupling action, substantially as described.

2. In a signaling apparatus, a rotary motor, a movable circuit closer and breaker comprising a spring-retracted lever pivoted to oscillate, and means comprising a pulley through which said rotary motor may intermittently oscillate said lever, substantially as described.

3. In a signaling apparatus, a movable circuit closer and breaker comprising a lever adapted to oscillate, a transmitting instrument and an intermediate rotary motor operating to oscillate the lever upon the operation of the transmitting apparatus, substantially as described.

4. In a signaling apparatus, a movable circuit closer and breaker, a continuously-operating motor and transmitting apparatus for automatically and intermittently connecting the motor to said circuit-closer, substantially as described.

5. In a signaling apparatus, a movable circuit closer and breaker comprising a spring-retracted lever adapted to oscillate, a continuously-rotating motor, gripping connections between the motor and said circuit closer and breaker, and a transmitting apparatus controlling the gripping action, substantially as described.

6. In a signaling apparatus, a movable circuit closer and breaker comprising a spring-retracted lever adapted to oscillate, a continuously-rotating motor, means for coupling the motor with the circuit closer and breaker, and automatically-operating transmitting apparatus, controlling the coupling action, substantially as described.

7. In a signaling apparatus, a movable circuit closer and breaker comprising a spring-retracted lever adapted to oscillate, a continuously-rotating motor, means for coupling the motor with the circuit closer and breaker, automatically-operating transmitting apparatus, and an electromagnet in circuit with said transmitting apparatus, for controlling the coupling action, substantially as described.

8. In a signaling apparatus, a movable circuit closer and breaker, a continously-rotating motor, means comprising a flexible band for coupling the motor with the circuit closer and breaker as desired, and a transmitting instrument controlling the coupling action, substantially as described.

9. In a signaling apparatus, a motor, a circuit closer and breaker mounted to oscillate, a band attached to said circuit-closer and adapted to be frictionally engaged by said motor, substantially as described.

10. In a signaling apparatus, a lever carrying a circuit-terminal, yielding means for holding the lever in the open position and a rotatable motor adapted to intermittently engage said lever through a flexible connection, substantially as described.

11. In a signaling apparatus, a lever carrying a circuit-terminal, a motor, a pulley on said motor and a flexible connection attached to said lever and adapted to be intermittently engaged by said pulley, substantially as described.

12. In a signaling apparatus, a lever carrying a circuit-terminal, a flexible band connected with the lever, a motor, and a transmitting instrument and connections for connecting the band with the motor, substantially as described.

13. In a signaling apparatus, a lever carrying a circuit-terminal, a flexible band connected with the lever, a motor, a transmitting instrument, and an electromagnet and connections for connecting the band with the motor, substantially as described.

14. In a signaling apparatus, a lever carrying a circuit-terminal, a flexible band connected with the lever, a motor, a pulley for pressing the band into engagement with the motor, an electromagnet operating upon said pulley and an automatic transmitting instrument connected with the electromagnet, substantially as described.

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