(No Model.)

M. MARTIN.

MULTIPLE SIGNAL TRANSMITTER.

No. 397,194. Patented Feb. 5, 1889.

Fig. 1,

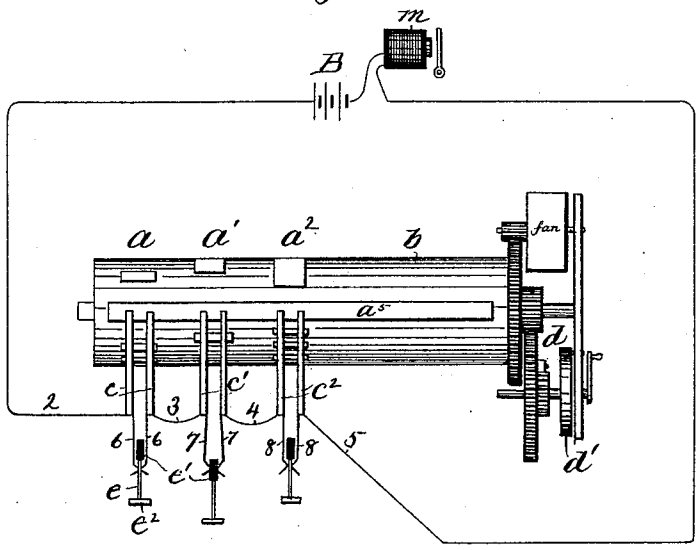


Fig. 2.

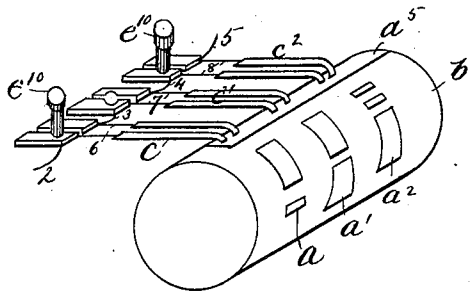


Fig. 4.

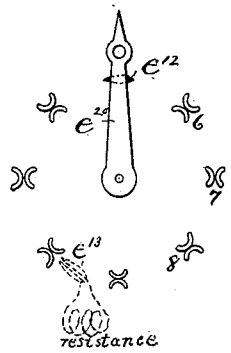
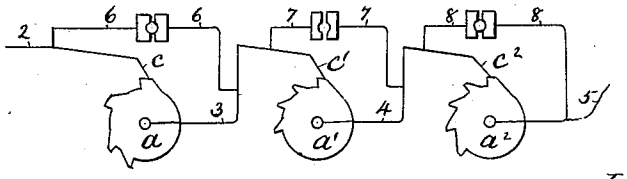


Fig. 3,



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UNITED STATES PATENT OFFICE.

MORRIS MARTIN, OF MALDEN, MASSACHUSETTS.

MULTIPLE-SIGNAL TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 397,194, dated February 5, 1889.

Application filed May 31, 1888. Serial No. 275,647. (No model.)

To all whom it may concern:

Be it known that I, MORRIS MARTIN, of Malden, county of Middlesex, and State of Massachusetts, have invented an Improvement in Multiple-Signal Transmitters, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to a multiple-signal transmitter by which any desired one of a number of predetermined signals may be sent over a circuit, such apparatus being useful wherever it is desired to enable an operator to send any one of a number of different distinct messages automatically by the operation of a motor, such as commonly used in fire-alarm or district telegraphs.

The invention is embodied in an instrument comprising a motor and number of distinct signaling surfaces—such as break-wheels or their equivalents—all moved simultaneously by said motor, the two co-operating members of each of said break-wheels or automatic circuit closing and breaking devices being permanently connected in series with one another, and each of said make-and-break devices being provided with an independent shunt-circuit, which when closed prevents the corresponding make-and-break devices from having any material effect upon the circuit. When the motor is operated, that one of said shunts will be kept open which corresponds to the make-and-break device the signal of which is to be transmitted, and the other shunts will all be closed, so that the interruptions in the current will correspond to the shape or form of the particular signaling-surface or make-and-break device of which the shunt is opened.

Figure 1 is a plan view of a multiple-signal transmitter embodying this invention, the circuit being represented in diagram; Fig. 2, a perspective view of a portion of said transmitter, showing a modification in mechanical construction; Fig. 3, a diagram representing another modification in mechanical construction, and Fig. 4 a detail showing a modification of the shunt-controlling device.

The instrument forming the subject of this invention comprises a number of circuit closing and breaking devices, which may, for convenience, be called "break-wheels," each consisting of a device moved by a motor, which in its movement causes the engagement and separation of two circuit-terminals, or, in other words, produces a number of interruptions in the current during such movement, which interruptions in the current or breaks in the circuit are controlled as to their number and duration by the formation of the moving part. Many well-known devices, varying considerably in mechanical construction, are employed for thus automatically producing definite interruptions in the current, and the term "break-wheel" is herein employed to designate any such device.

As shown in Fig. 1, the break-wheels consist of sets $a\ a'\ a^2$ of pieces of conductive material forming part of the surface of a drum, *b*, the remainder of which surface is composed of insulating material, each of said sets of conducting-pieces $a\ a'$, &c., co-operating with a pair of springs or contacts, $c\ c'\ c^2$, any of which pieces may constitute the terminals of the main circuit containing the battery B over which the signals are to be transmitted.

The entire series of break-wheels $a\ a'$, &c.—or, in other words, the drum *b*—is arranged to be operated by a motor, *d*, which may be of any usual construction—such as commonly employed in fire-alarm and district telegraph apparatus—the said drum being rotated one or more times whenever the said motor has its actuating-spring d' or other actuator wound or placed by the operator in condition to drive the motor.

Every automatic circuit making and breaking device comprises two members which are placed in electrical contact and then separated in the operation of such devices, and the term "break-wheel," as herein employed, applies to or includes these members.

As shown in Figs. 1 and 2, the members which are thus alternately connected and separated in the rotation of the break-wheels are the pairs of springs which are connected by the metallic strips forming the wheel proper; but in the construction shown in Fig. 3 the wheel proper forms one member, and the spring that co-operates with its surface forms the other of the members between which the electrical connection is alternately made and broken. In any mechanical construction of these devices the two members that are

connected and separated by the rotation of a given break-wheel are, in accordance with the present invention, connected in circuit in series with one another, as shown, the main circuit passing, as indicated at 2, to one member of the first break-wheel, the other member of which is connected, as shown at 3, with one member of the next break-wheel, the other member of which is connected, as shown at 4, with the next, and so on for as many as may be in circuit, and if this circuit, passing through the several break-wheels *seriatim*, as stated, were the only path for the current it is obvious that the main circuit would be open or the current interrupted whenever the two members of any one of the entire series of break-wheels were separated in the simultaneous movement of said break-wheels. In order, however, that the circuit or current may be effected by one only of said break-wheels during any one operation of the entire series, and that any desired one of said break-wheels may be chosen to thus control the circuit, a shunt or branch circuit is provided for each of said break-wheels, which, when closed, connects the two members of the break-wheel, so that they cannot open the circuit during the movement of said break-wheel. Thus by opening one of said shunts and keeping all the others closed that break-wheel only of which the shunt is opened will produce any effect on the current in the rotation of the entire series of break-wheels. A circuit-controller is provided for each of said shunts, which may be of any desired construction, several modifications in construction being shown.

For example, as shown in Fig. 1, each shunt is composed mainly of two contact-springs normally pressed against one another or against an intervening conducting rod or strip, *e*, provided with an insulating portion, *e'*, and a head or handle, e^3, which may have marked upon it the signal which the circuit changes produced by the corresponding break-wheel are understood to indicate.

By drawing out one of the handles e^2—as, for example, the one shown as corresponding to the break-wheel *a'*, (see Fig. 1)—the corresponding shunt, 7, is opened and the main circuit is placed in control of the corresponding break-wheel, which makes and breaks the said circuit in its rotation, while the current passes by the other break-wheels through the shunts 6 and 8 without being affected by the said break-wheels.

In the construction shown in Fig. 2 the shunts terminate in the two portions of divided plug-sockets, which may be connected by metallic plugs e^{10}, and the one plug is removed, corresponding to the break-wheel the signal of which is to be transmitted.

As shown in Fig. 4, the spring-terminals of the shunts, which normally make contact with one another, are arranged in a circle about the center of a handle or pointer, e^{30}, which is provided with a wedge, e^{12}, of insulating material, which enters between and separates the spring-terminals of the shunt of any desired one of the break-wheels.

The signals may be received on any suitable receiving-instrument—such, for instance, as an electro-magnet, *m*, which may be a part of a recording-instrument or a relay controlling a recording or signaling instrument of any suitable or usual character.

In the construction of break-wheels shown in Figs. 1 and 2, in which the said wheels are all mechanically connected or form part of a single drum, and each co-operates with a pair of springs forming the members that are separated and connected during the rotation of the wheel, the electrical contacts on which the said springs rest when the motor and drum have stopped in their normal position may all be connected, forming a single contact-strip, a^5, thus diminishing the liability of leaving the main circuit open by a bad contact or connection in the transmitter. This is an important improvement in automatic multiple-transmitters operating in a normally-closed circuit, since, owing to the multiplication of the signaling-surface, there is increased liability to form an open circuit; but if the connection between the two springs of any pair is not properly made at the surface of the wheel the corresponding shunt will keep the main circuit closed, and if one of the connections 3 4, &c., between the different pairs of members of the different break-wheels should be imperfect the line-circuit would be maintained through the strip a^5.

The part e' or e^{12}, that is interposed between the terminals of the shunts in order to make the corresponding break-wheels operate, instead of being of insulating material, might be of high resistance, or might constitute two separate terminals of a resistance-coil or equivalent, as indicated in dotted lines at e^{13}, Fig. 4, so that the break-wheels the shunt of which is connected with such device e^{13} would operate to alternately strengthen and weaken the current instead of wholly interrupting it, and it will be seen that by this construction a single resistance-coil could be made to co-operate with any desired one of the break-wheels.

I claim—

1. A signal-transmitting instrument comprising a number of distinct signaling-surfaces or break-wheels connected to move simultaneously, the co-operating members of each of said break-wheels being permanently connected in series with one another, combined with a shunt-circuit around the co-operating members of each break-wheel and circuit-controllers in said shunts, whereby any desired one of said shunts may be retained open and the remainder closed during the simultaneous movement of said break-wheels, substantially as described.

2. The combination of a motor and drum moved thereby with a series of contact-surfaces on said drum and pairs of springs co-

operating therewith, constituting independent break-wheels, one of said surfaces being continuous under all said springs, and the different pairs of springs being connected in series with one another, and shunts around each pair of springs, substantially as described.

3. A signal-transmitting instrument comprising a motor and a number of distinct signaling-surfaces or break-wheels moved simultaneously thereby, the co-operating members of each of said break-wheels being permanently connected in series with one another, combined with separate shunt-circuits around each of said break-wheels, substantially as and for the purpose described.

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

MORRIS MARTIN.

Witnesses:
JOS. P. LIVERMORE,
M. E. HILL.