

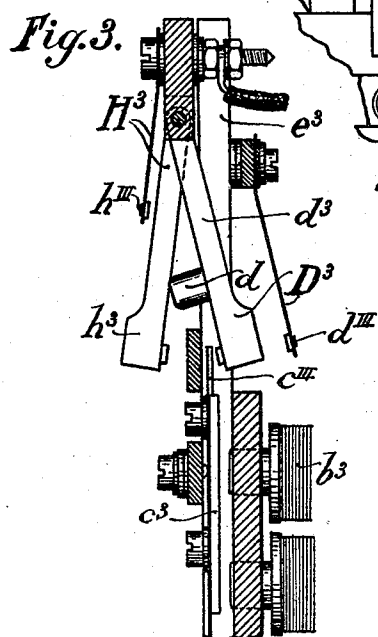
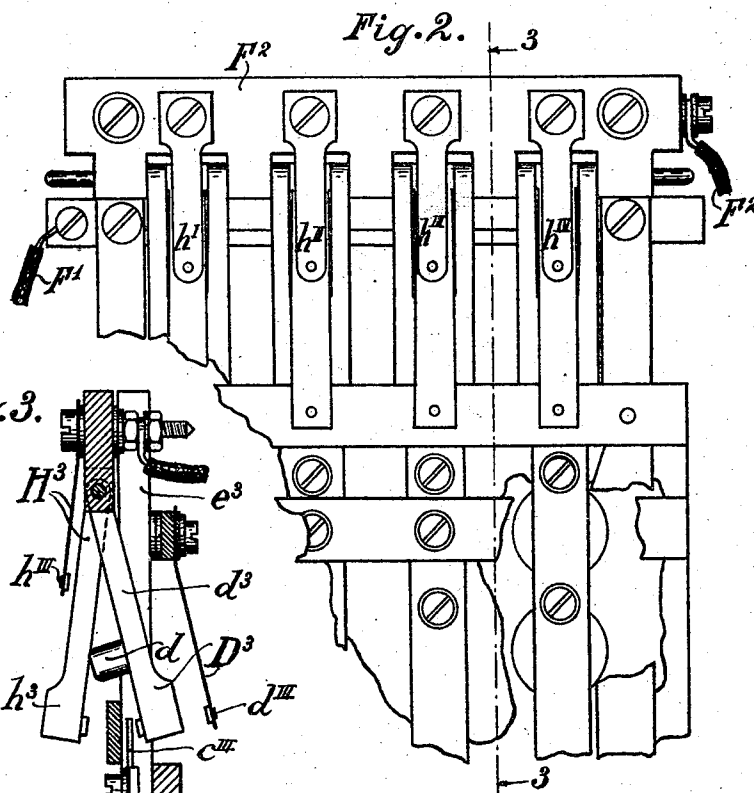
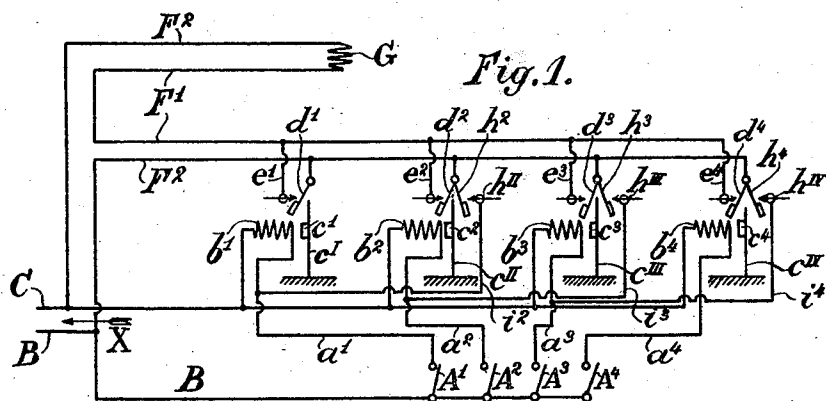
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ELECTRICAL TRANSMISSION DEVICE

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ELECTRICAL TRANSMISSION DEVICE.

Application filed August 26, 1922, Serial No. 584,472, and in Switzerland September 7, 1921.

This invention has for its object an electric transmission device which permits of the transmission at a distance of several separate electrical orders, with the use of a restricted number of conductors. This device comprises a series of interrupters, arranged on the cascade principle and operated separately by a corresponding series of electromagnets which control them, so as to transmit to a common receiver a number of impulses which differ according to the position which the interrupter actuated occupies in the cascade.

The accompanying drawing represents partially, by way of example, a constructional form of the subject matter of the invention applied to the control of the firing indicator of an automatic target of the type described in the specification of U. S. Patent No. 1,406,674.

Figure 1 is a diagram of the electric connections of the part of the installation represented.

Figure 2 is an elevation of this part and

Figure 3 is a section on the line 3—3 of Figure 2.

In targets of this type it has generally been necessary hitherto, in order to electrically connect the target to the firing indicator arranged near the target, a number of conductors equal in number to the number of the positions which the indicator can occupy plus one, whereas, with the transmission device according to the present invention it suffices to have one pair of conductors for the same order of movements of the index. Thus in the present case of the application of the example partially represented of the apparatus according to this invention to a target with four concentric divisions (called target A) subdivided into four quadrants, three conductors are required, namely one for the radial movements of the index, one for the angular movements of the same and one for the return where heretofore 11 conductors were necessary.

In the example shown B and C indicate two main conductors connected to a source

of current X (not shown but indicated diagrammatically in Figure 1) and four interrupters A^1, A^2, A^3, A^4 actuated as will be hereinafter described so as each to form a circuit passing through a conductor a^1, a^2, a^3 , or a^4 and an electromagnet b^1, b^2, b^3 or b^4 in order to excite one of these magnets. The magnet thus excited attracts an armature c^1, c^2, c^3 or c^4 carried by a flexible metallic tongue c^I, c^{II}, c^{III} , or c^{IV} the free end of which then acts on the oscillating contact d^1, d^2, d^3 or d^4 of a pendulum interrupter D^1, D^2, D^3 or D^4 so as to close momentarily a circuit passing through the other contact d^I, d^{II}, d^{III} or d^{IV} of the pendulum interrupter, a conductor e^1, e^2, e^3 or e^4 , a conductor F^1 , the electromagnet G indicated diagrammatically in Figure 1, controlling the index of the indicator, as will be hereinafter described, a conductor F^2 , the main conductor C and the source of current X.

As soon as the interrupter is actuated and either contact d^1, d^2, d^3 or d^4 has touched the corresponding contact d^I, d^{II}, d^{III} or d^{IV} it drops back under the action of its own weight and transmits, by means of a stud d an impulse to an oscillating contact h^2, h^3 or h^4 of a pendulum interrupter H^2, H^3 or H^4 sufficient to close this interrupter. The fixed contact h^{II} of the interrupter H^2 is connected by a conductor i^2 to a conductor a^1 , the fixed contact h^{III} of the interrupter H^3 by a conductor i^3 to the conductor a^2 and so on.

The working of these four elements thus arranged in cascade fashion is as follows:

When the interrupter A^1 is closed the electromagnet G only receives one impulse because the element I is not connected to the other similar elements, whereas when the interrupter A^2, A^3 or A^4 respectively is closed the electromagnet G receives respectively two, three or four impulses, because the element II is connected to the element I by the closing of the interrupter H^3 and so on. Any number of elements may of course be arranged in the same way.

In the case of the application of the trans-

mission device according to this invention to an automatic target A of the type described in Patent No. 1,406,674, the movements of the index of the firing indicator are controlled by two electromagnets G, each respectively connected to a series of four elements as shown. One of these electromagnets controls the four radial movements of the index, corresponding to the three concentric annular divisions of the target and to the central circular division, while the other electromagnet controls the four angular movements thereof at 90° to each other corresponding to the other four quadrants of the target.

Each interrupter A¹, A², A³ or A⁴ of the series of four elements controlling one of the electromagnets G, for example the one which controls the angular movements of the index, is connected to one of the quadrants of the target, so as to be closed when a bullet happens to strike this quadrant, each interrupter A of the series not shown (controlling the radial movements of the index), is connected to one of the four concentric circular divisions of the target, so as to be closed when a bullet hits this division.

Thus every time a bullet hits the target an interrupter A¹, A², A³ or A⁴ of the series represented and simultaneously an interrupter A of the other series will be closed so as to transmit to the two electromagnets G the desired number of impulses determining the movement of the index simultaneously in two directions necessary for bringing it on to the indicator, placed near the person firing, in a position corresponding to that of the point struck on the target.

This application to a target is given by way of example only, and it must be thoroughly understood that this device may be applied to any other long distance electric transmission in which it may be of advantage to reduce to a strict minimum the number of conductors necessary.

The pendulum interrupters may naturally be replaced by other interrupters.

I claim:

1. An electrical apparatus for sending a variable number of impulses over an impulse circuit, comprising a series of electro-magnets, means including a contact device associated with each electro-magnet for momentary energization of each electro-magnet to cause an impulse to be sent over the impulse circuit and also including a second contact device associated with each of the aforesaid contact devices except that associated with the first magnet in the series to cause the momentary energization of the next adjacent electro-magnet of the series, and means for selectively causing the momentary energization of any magnet of the series whereby the number of impulses imparted to the impulse circuit depends upon

the particular magnet in the series selected for energization by the last aforesaid means.

2. An electrical apparatus for sending a variable number of impulses over an impulse circuit, comprising a series of electro-magnets each including an armature, means including a contact device associated with the armature of each electro-magnet to momentarily energize the same and to thereby cause an impulse to be sent over the impulse circuit and also including a second contact device associated with the said contact device in each magnet except the first magnet of the series to momentarily energize the next electro-magnet of the series, and means for selectively causing the momentary energization of each magnet of the series whereby the number of impulses imparted to the impulse circuit depends upon the particular magnet in the series selected for energization by the last aforesaid means.

3. An electrical apparatus for sending a variable number of impulses over an impulse circuit, comprising a series of electro-magnets each having an armature, a swinging contact device associated with the armature of each electro-magnet for momentarily energizing the same and causing an impulse to be sent over the impulse circuit, a device associated with the said swinging contact device of each electro-magnet except the first magnet in the series for momentarily energizing the next adjacent electro-magnet of the series, and means for selectively causing the momentary energization of any magnet of the series whereby the number of impulses imparted to the impulse circuit depends upon the particular electro-magnet in the series selected for the energization by the last aforesaid means.

4. An electrical apparatus for sending a variable number of impulses over an impulse circuit, comprising a series of electro-magnets each including an armature, a swinging contact device associated with the armature of each electro-magnet for momentarily energizing the same to cause an impulse to be sent over the impulse circuit, a second swinging contact device associated with each of the aforesaid contact devices of each of the electro-magnets with the exception of the first electro-magnet in the series for momentarily energizing the next adjacent electro-magnet of the series, and means for selectively causing the momentary energization of each electro-magnet of the series whereby the number of impulses imparted to the impulse circuit will depend upon the particular electro-magnet in the series selected for energization by the said means.

5. An electrical apparatus for sending a variable number of impulses over an impulse circuit, comprising a series of electro-magnets each including an armature, a swinging contact device associated with the armature

of each electro-magnet for momentarily energizing the same to cause an impulse to be sent over the impulse circuit, a second swinging contact device associated with each of the aforesaid contact devices of each of the
5 electro-magnets with the exception of the first electro-magnet in the series for momentarily energizing the next adjacent electro-magnet of the series, and a series of switches

each adapted to close a circuit to a corresponding electro-magnet whereby the number of impulses imparted to the said impulse circuit depends upon the particular electro-magnet in the series selected for energization by any of the said switches. 10 15

In testimony whereof I have affixed my signature.

ARNOLD MICHOD.