No. 841,105. PATENTED JAN. 15, 1907.

R. A. BALDWIN.

RECORDING SIGNAL TRANSMITTER.

APPLICATION FILED NOV. 10, 1905.

Fig. 1.

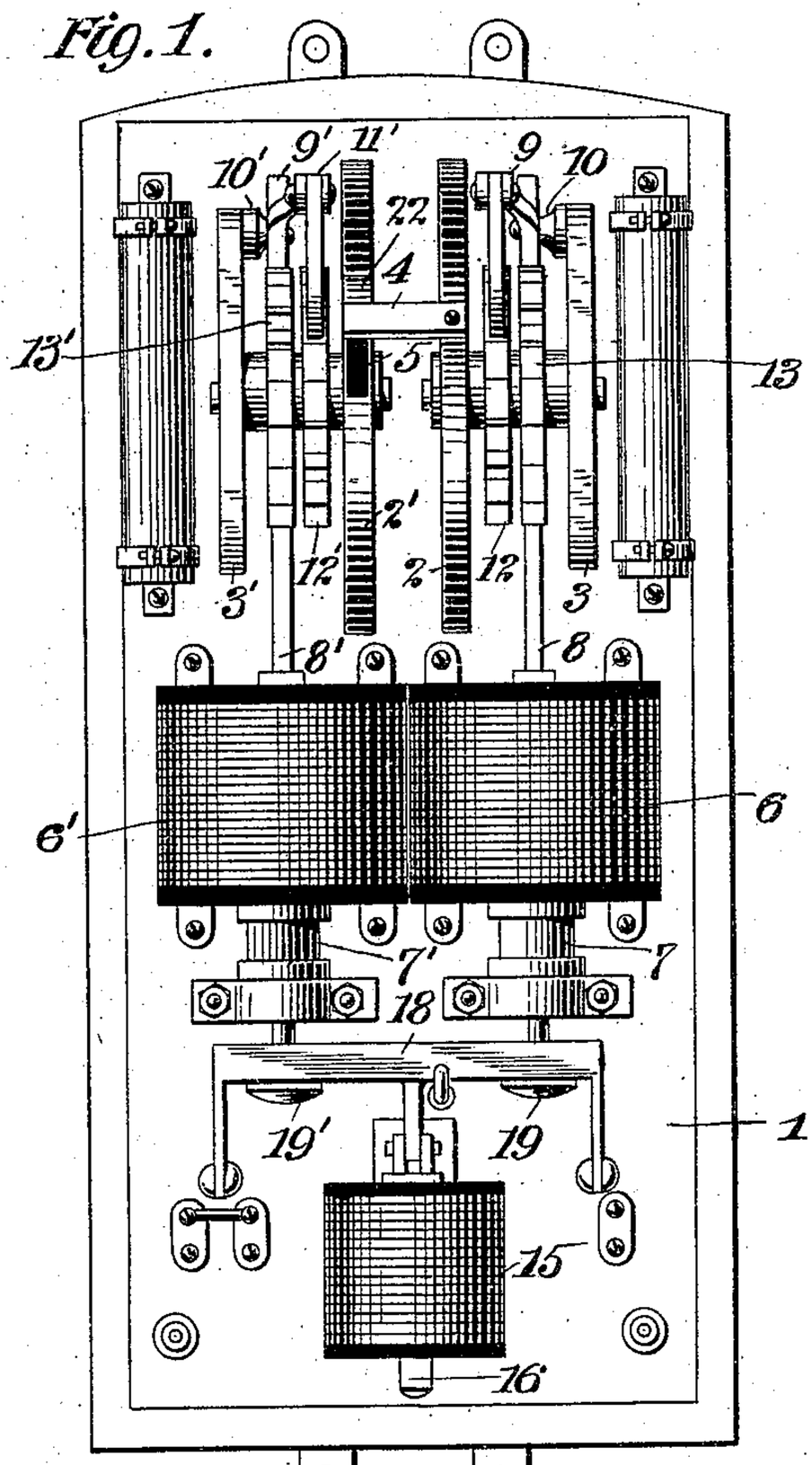


Fig. 2.

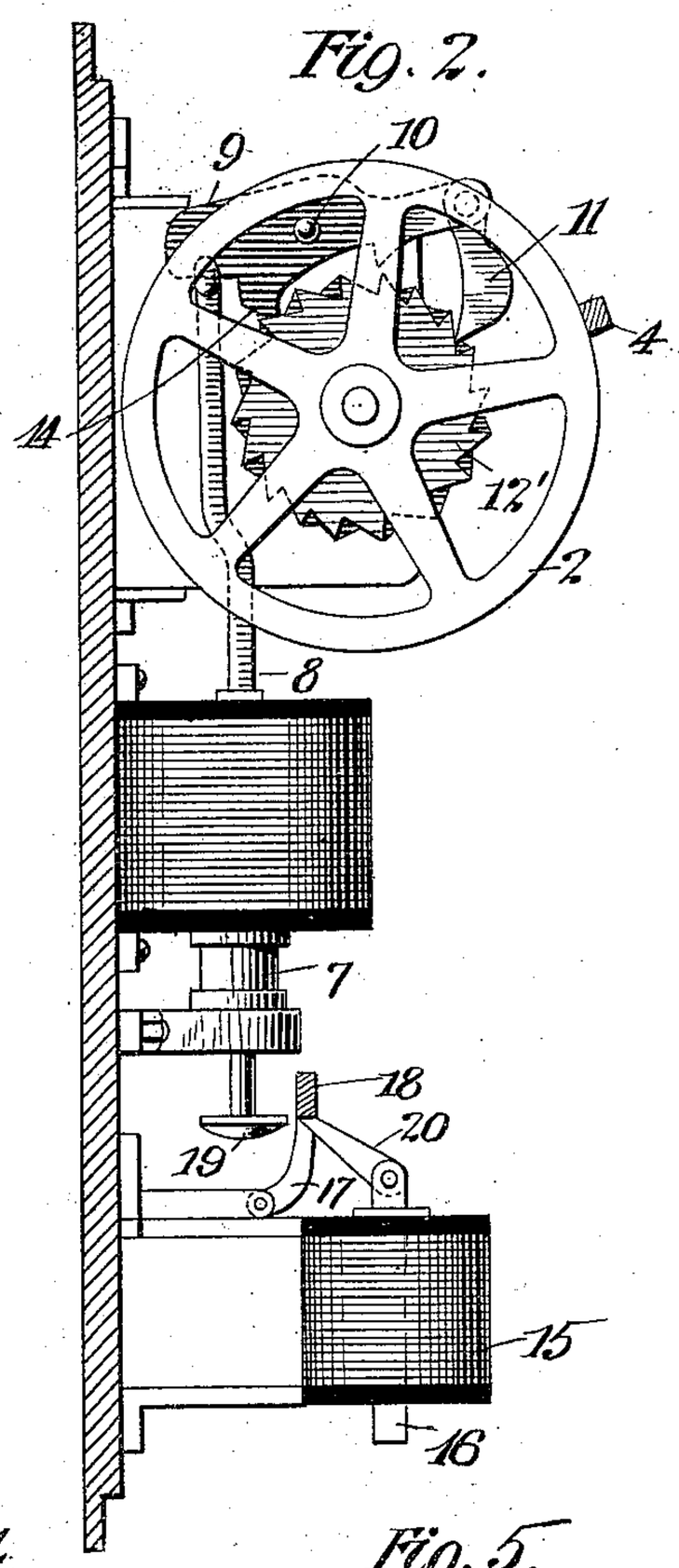


Fig. 3.

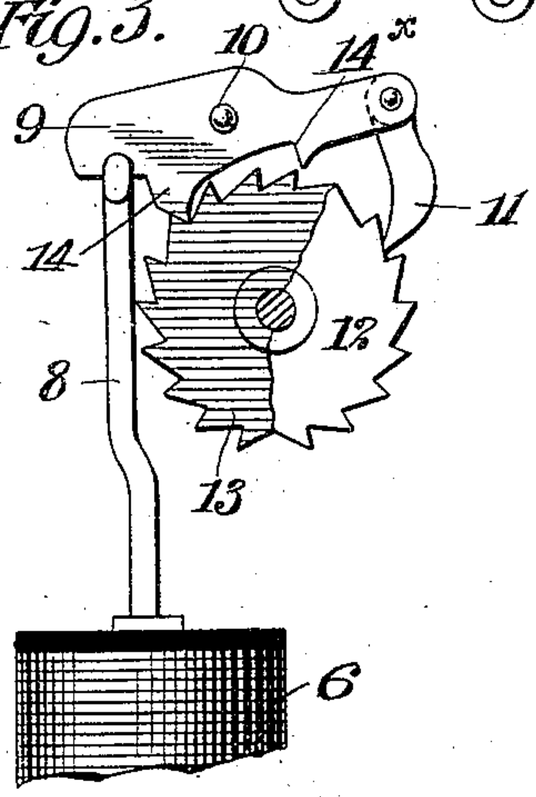


Fig. 4.

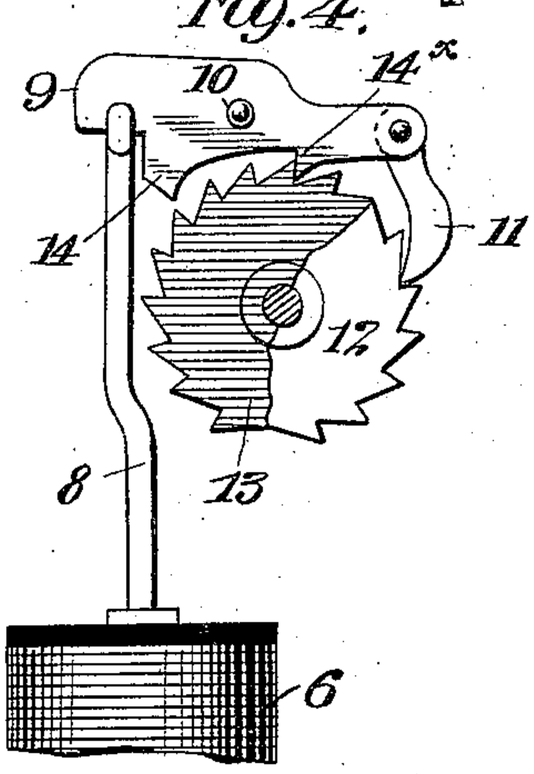
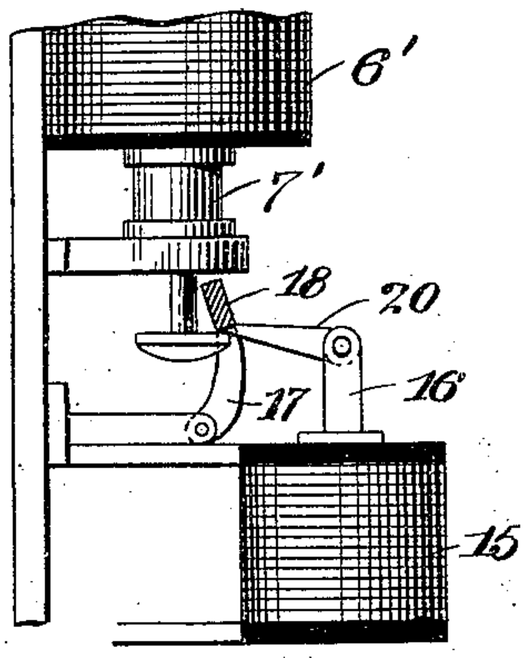


Fig. 5.



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RECORDING SIGNAL-TRANSMITTER.

No. 841,105. Specification of Letters Patent. Patented Jan. 15, 1907.

Application filed November 10, 1905. Serial No. 286,651.

To all whom it may concern:

Be it known that I, ROLLIN A. BALDWIN, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Recording Signal-Transmitters, of which the following is a full, clear, and exact description.

My invention relates to railroad-signals.

In a prior application filed by me and George D. Foote, Serial No. 273,504, there is set forth a signal system particularly adapted for single-track trolley-roads, in which turnouts are provided at intervals to enable the cars to pass one another.

My present invention relates particularly to an apparatus for use with such a system, and which I shall term a "recording signal-transmitter."

While the present invention is applicable to the system above referred to it, is of course not limited to this use and may be embodied in various relations in signal and other systems.

The object of the invention is to provide a recording signal-transmitter which shall be certain of operation under any contingency which may arise in practice.

A further object of the invention is to provide a recording signal-transmitter which shall be simple and convenient to manufacture and easy to install and operate.

With these and other objects in view my invention consists in the construction, combination, location, and arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally particularly pointed out in the appended claims.

Referring to the drawings, Figure 1 is a front elevation showing a complete recording signal-transmitter embodying the principles of my invention. Fig. 2 is a central vertical sectional view of the same, taken toward the right-hand half of the device in Fig. 1. Fig. 3 is a detail view of the feeding-pawl mechanism. Fig. 4 is a view of the same in a different position. Fig. 5 is a detail side view showing the locking-magnet and parts.

It will be understood that in the operation of single-track roads the cars are constantly passing in both directions, and it is necessary to hold back the cars in one direction at the turnouts until all the cars from the opposite direction on the single-track section ahead have left the same. I arrange means by which signals are given whenever cars pass onto a single-track section and I arrange the signal transmitter to be recording—that is, to take account of the number of cars which enter the section, and operate to maintain the signal transmitted until all of such cars have again left the section. I also provide means by which the correct signals are transmitted regardless of unusual conditions—such, for example, as two cars entering and leaving a section absolutely simultaneously or the disobedience of any motorman of signals displayed and who enters a section upon which cars are already moving from the opposite end.

Referring now to the drawings, and to the various views and reference-signs appearing thereon, in which like parts are designated by the same reference-sign, 1 indicates a base or frame to which all of the operating parts are secured. Upon this frame and conveniently opposite the upper face thereof I provide a pair of contact-wheels 2 2′, which are separately journaled in coaxial relation with one another in bearings 3 3′, projecting from the base-board. The contact-wheels 2 2′ may be supported in any desired way so that their faces are parallel with one another and in slightly-spaced-apart relation.

Each of the contact-wheels 2 2′ forms part of a signal-transmitting circuit, and the arrangement is such that when the wheels are in electrical connection with one another the transmitting-circuit is closed and a signal is given which corresponds to cars upon the single-track section. For this purpose I provide a contact strip or brush 4 upon one of the contact-wheels 2 and projecting laterally over the periphery of the other contact-wheel 2′, so as to press thereagainst. 5 indicates an insulating-section on the contact-wheel 2′, and the parts are so arranged that the contact-strip 4 normally lies over the insulated section 5 and prevents electrical communication between the two wheels. If, however, the wheel 2 is moved forwardly, the

contact-strip will pass off of the insulated section onto the bare periphery of the contact-wheel 2′ and establish an electrical communication which will close the signal-circuit. (Not shown.)

I provide means by which the wheels 2 and 2′ are stepped around under certain circumstances, and for this purpose I have shown electromagnetic coils 6 6′, each of which has guided therein a core or plunger 7 7′ and from which project upward the links or connections 8 8′. 9 9′ denote a pair of rocking levers pivoted at points 10 10′ upon the frame of the machine. Each of the rocking levers 9 9′ has upon it a feeding-pawl 11 11′, which depends therefrom by gravity in proximity to ratchet-wheels 12 12′, which are respectively secured to rotate with the contact-wheels 2 2′ above described. The rear portions of the rocking levers 9 9′ extend into the path of the links or connections 8 8′, so that whenever such links or connections are raised under the influence of their operating-magnets the rocking levers are tilted and the feeding-pawls 11 11′ depressed to feed the appropriate ratchet-wheel 12 or 12′, as the case may be.

In addition to the above feeding-pawls I also provide locking-pawls which preclude either of the contact-wheels from being improperly actuated by friction of the strip 4 or in any other way. I have shown a practical construction for this purpose employing ratchet-wheels 13 13′, generally similar to the ratchet-wheels 12 12′ above described and fixed adjacent thereto, but having their teeth directed in the opposite sense. With these secondary ratchet-wheels 13 13′ there coöperate what I shall term "locking-pawls" 14, which are preferably integral with the rocking levers 9 and are disposed so as to normally engage the ratchet-wheels 13 13′ and prevent any improper feeding movement of either contact-wheel. I also provide on each rocking lever another detent 14×, Figs. 3 and 4, which is normally out of contact with the ratchet-wheels, but which moves into the path of a tooth on the ratchet-wheel 13 or 13′ and limits the feeding movement thereof under the influence of the feeding-pawl.

An additional feature of my invention relates to the means for locking the parts against movement under certain conditions. Referring particularly to Figs. 1, 2, and 5, 15 denotes a locking-magnet, which is in the form of a solenoid having a movable core or plunger 16. Pivoted adjacent to this magnet is a hinged frame 17, having a locking-bar 18, arranged to swing in the path of studs 19 19′ at the lower ends of the connections 8 and 8′, respectively. The frame 17 has projecting therefrom a rigid arm or connection 20, to which is pivotally attached the core or plunger 16 above described. In this way the movements of the plunger are transmitted to the frame 17, and the locking-bar 18 is rocked into the path of the studs 19 19′ whenever said plunger is raised.

The operation is as follows: Whenever a car enters the particular block-section to which my recording signal-transmitter is applied, the solenoid-magnet 6 is momentarily energized in any suitable way—as, for example, by the arrangement of circuits set forth in my above-mentioned application. Under the influence of the magnet 6 the core 7 is temporarily raised, thereby rocking the lever 9 about its pivot-point 10 and depressing the feed-pawl 11 to rotate the contact-wheel 2 a single notch. In this action the movement of the wheel 2 is confined to the required amount by the detent 14× above described. After the momentary current has ceased in the magnet-coil 6 the link 8 and rocking lever assume their normal relation with the locking-pawl 14 in engagement with the ratchet-wheel 13 to prevent any return movement of the contact-wheel. The contact strip or brush 4 now bears against an uninsulated portion of the wheel 2′, and a signal-circuit is closed to indicate the car upon the block-section. In like manner the contact strip or brush 4 will be similarly stepped around for each succeeding car which enters the block, continuing to bear against the unprotected periphery of the wheel 2′ and maintaining the signal transmitted. When the cars begin to leave the block-section, a connection is made in any suitable way with the other solenoid-magnet 6′, which acts through the link or connection 8′ upon its feeding-pawl 11′ in precisely the same way as the corresponding parts 8 and 11 above described were actuated. The contact-wheel 2′ is now stepped around in a forward direction, so that the insulated section 5 tends to overtake the contact-strip 4 wherever the latter happens to be. It is evident that as many impulses are required to make the insulated section 5 overtake the contact-strip 4 as were initially given to the contact-strip-carrying wheel 2. In other words, all the cars which entered the section must leave the same before the signal-circuit is again broken by the insulating-section 5.

A practical feature of my invention consists in the means by which the apparatus is insured against getting out of adjustment, no matter how many cars enter the block-section. In order to prevent the contact-wheel 2 from traveling entirely around the periphery of the wheel 2′, so that the strip or brush would again arrive on the insulated section 5, I provide a stop 22 upon the periphery of the wheel 2′, which limits the relative movement of the wheels to less than a complete circumference. This stop also acts on the return movement to prevent too great

relative movement of the wheels when the excessive number of cars leave the block.

If a car should happen to leave the block-section at precisely the same instant that another car entered it, it might happen that the contact-wheels 2 and 2′ would be fed simultaneously, so that their relative position would remain unchanged. This, however, is as it should be, since under these circumstances the issuing car compensates for the entering one, and the instrument should have recorded within it the same number of cars as before.

Whenever the cars are entering the section from the direction opposite to that of the operations above described, locking-magnet 15 is energized in any suitable way—as, for example, by the circuits of the above-mentioned application—and the locking-bar 18 is thrown into the path of the studs 19 19′. After this it is impossible for either of the magnets 6 6′ to be operated, no matter if a motorman should disobediently enter the section, since their armatures are mechanically held from being drawn upward. It will thus be seen that I provide for all contingencies which arise in practice and secure the transmission of the warning-signal as long as cars remain upon the single-track section protected.

What I claim is—

1. In a signal-transmitter, a pair of coaxial contact-wheels, a contact strip or brush extending from the periphery of one of said wheels and bearing upon an insulated section upon the periphery of the other, a pair of ratchet-wheels secured to rotate with each of said contact-wheels, and having their teeth pointed in opposite directions, and feeding and locking pawls respectively cooperating with said ratchet-wheels.

2. In a signal-transmitter, a pair of contact-wheels arranged to transmit a signal by their relative movement, ratchet-wheels for moving said contact-wheels, rocking levers in proximity to said ratchet-wheels, and feeding and locking pawls on said rocking levers for engaging said ratchet-wheels.

3. In a signal-transmitter, a pair of coaxial contact-wheels having means by which their relative movement is effective to transmit a signal, ratchet-wheels secured to said contact-wheels, feeding and locking pawls coöperating with said ratchet-wheels, and a pair of solenoid-magnets operatively connected to said feeding and locking pawls.

4. In a signal-transmitter, a pair of coaxial contact-wheels arranged to transmit a signal by their relative movement, a pair of solenoid-magnets operatively connected to step around either desired wheel, and a locking-magnet arranged to mechanically prevent such actuation when desired.

5. In a signal-transmitter, a pair of coaxial contact-wheels, a contact strip or brush secured to the periphery of one of said wheels and bearing upon that of the other, and a stop upon the periphery of said latter wheel disposed to prevent rearward movement of the strip-carrying wheel under normal conditions.

6. In a signal-transmitter, a pair of coaxial contact-wheels, a contact strip or brush secured to the periphery of one of said wheels and bearing upon an insulated section upon the other, ratchet-wheels and feeding-pawls for positively moving said contact-wheels in the same direction, and additional ratchet-wheels and locking-pawls for normally holding the contact-wheels against movement.

7. In a signal-transmitter, a pair of coaxial contact-wheels having ratchet-toothed wheels secured thereto, a pair of magnets for feeding said ratchet-toothed wheels in the same direction, a locking-magnet and mechanical connections from said magnet for preventing movement of the contact-wheels when said locking-magnet is energized.

8. In a signal-transmitter, a pair of contact-wheels arranged to transmit a signal by their relative movement, pawl-and-ratchet mechanism for positively stepping around said wheels, a pair of operating-magnets, links or connections from said operating-magnets to said pawl-and-ratchet mechanism, a locking-bar hinged to move into the path of said links or connections, and a magnet for moving said bar.

9. In a signal-transmitter, a pair of coaxial contact-wheels arranged to transmit a signal by their relative movement, pawl-and-ratchet mechanism for positively feeding said wheels, operating-magnets, connections from said operating-magnets to said pawl-and-ratchet mechanism, a locking-bar arranged to prevent movement of said parts, and a magnet for moving said bar.

10. In a signal-transmitter, a pair of contact-wheels, means for stepping either of said wheels rotarily, a locking-bar hinged to prevent the actuation of said means, and a solenoid-magnet arranged to move said locking-bar.

11. In a signal-transmitter, a contact-wheel, a ratchet-wheel secured thereto, a second ratchet-wheel also secured thereto and having its teeth pointed in the opposite direction, a rocking lever adjacent to said ratchet-wheels and having a feeding and locking pawl coöperating respectively therewith, and a magnet for rocking said lever.

12. In a signal-transmitter, a contact-wheel, a pair of ratchet-wheels secured thereto and having their teeth oppositely directed, a rocking lever having feeding and locking pawls coöperating with the respective ratchet-wheels, a link connection abutting against a portion of said rocking lever and a solenoid-magnet for lifting said link connection when energized.

13. In a signal-transmitter, a pair of contact-wheels arranged to transmit a signal by their relative movement, a pair of solenoid-magnets having link connections for moving said wheels, studs upon the lower ends of said link connections, a hinged locking-bar arranged to move into the path of said studs and having a projecting arm, a solenoid-magnet, and a core or armature for said magnet depending from said arm.

In witness whereof I subscribe my signature in the presence of two witnesses.

ROLLIN A. BALDWIN.

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