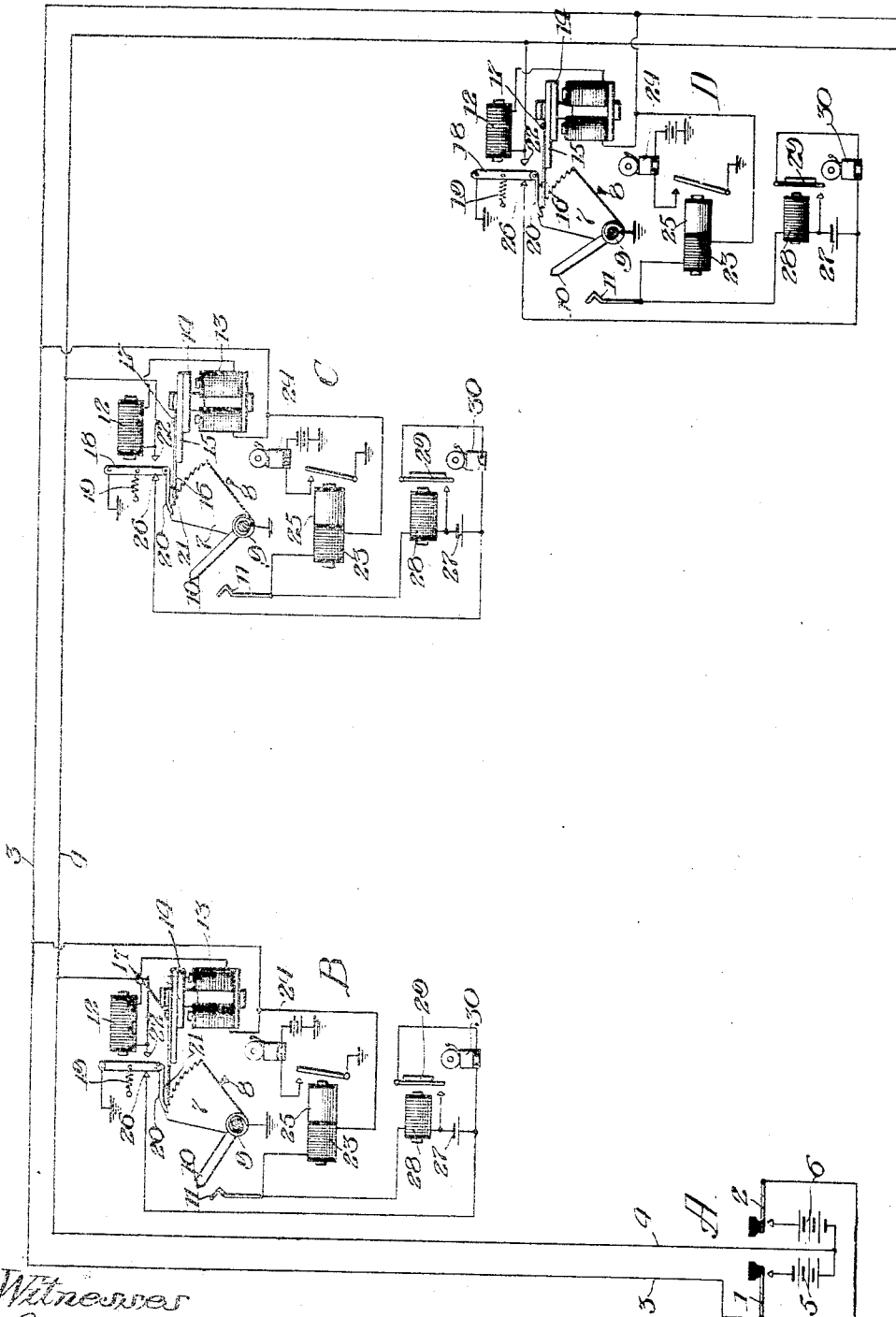


C. S. RHOADS, JR.
SELECTIVE SIGNALING SYSTEM.
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1,060,212.

Patented Apr. 29, 1913



Witnesses

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UNITED STATES PATENT OFFICE.

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SELECTIVE SIGNALING SYSTEM.

1,060,212.

Specification of Letters Patent.

Patented Apr. 29, 1913.

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To all whom it may concern:

Be it known that I, CHARLES STANLEY RHOADS, Jr., a citizen of the United States, residing at Sandwich, in the county of De-
5 kalb and State of Illinois, have invented a certain new and useful Improvement in Selective Signaling Systems, of which the following is a full, clear, concise, and exact description, reference being had to the accom-
10 panying drawings, forming a part of this specification.

My invention relates to signaling systems and has for its object the provision of an improved system in which it is possible to
15 call selectively any one of a plurality of substations from a central station.

In the preferred form of my invention, I use impulse mechanism of some suitable kind which is selectively moved by electro
20 magnetic means, and which impulse mechanism is further controlled by a second electro magnetic means, which second electro magnetic means are brought into or out of
25 operative relation with said impulse mechanism depending upon the character of the electric current furnished by the sending station.

I am aware that systems of this character have been devised following generally along
30 the lines above outlined, but in which there is no selective operation of the second electro magnetic means, which in the specific form herein shown, I prefer to call a locking or holding magnet. With this arrange-
35 ment it is also possible to provide two signal receiving devices at each station, which signal receiving devices may be selectively operated with a given position of the impulse mechanism.

40 I will describe my invention more in detail by reference to the accompanying drawing, illustrating one embodiment thereof.

In this illustration I show a central station A and substations B, C, and D. The
45 substation apparatus is alike at the various stations except that the signaling devices at each station are placed in operative condition with different angular positions of the impulse mechanism.

50 At the central station I have two keys, 1 and 2, both associated with the line conductor 3, which conductor in association with the line conductor 4, unites all of said stations together. The central station apparatus further includes two batteries 5 and
55

6. Battery 5 has its terminal of one polarity associated with the conductor 4 and battery 6 has its terminal of opposite polarity associated with said conductor. Of course, this specific arrangement need not
60 be adhered to, it is merely shown as illustrative. By means of the arrangement shown, it will be seen that positive or negative impulses can be transmitted metalli-
65 cally over the line wires 3 and 4.

I will describe a substation apparatus, which substation apparatus is designed to be operated by the central station, and at the substation I have an impulse mechanism
7 which is held in its normal non-contact
70 position against the stop 8 by a spring 9. This impulse mechanism carries an arm 10, which, when in a given position engages a spring 11. The arms 10 are preferably in
75 different angular positions when the impulse mechanisms 7 are in their zero positions, so that unlike numbers of impulses are required to establish signal operating conditions at the various substations.

The impulse mechanism 7 is designed to
80 be stepped up to operating position by a step-up magnet 12, which step-up magnet 12 is arranged preferably in series with a polarized magnet 13, both of said magnets being in bridge of the line conductors 3 and
85 4. The polarized magnet 13 has an armature 14 carrying a metallic bar 15 to which is fastened a locking pawl 16 by a rivet 17. The step-up magnet 12 has an armature 18
90 which is held in its normal position by a spring 19. This armature 18 carries a pawl 20, which in the reverse movement of the armature steps up the impulse mechanism one step. The holding pawl 16 is brought
95 into contact with the teeth of the impulse mechanism 7 whenever battery impulses of a kind adapted to step-up the impulse mechanism are sent over the line wires, which impulses, we will assume in this instance,
100 are delivered by the battery 5.

After the required impulses have been sent, that is, after the substation signals have been actuated, a reverse battery impulse from the battery 6 is sent over the
105 line wires by the key 2, and this operates the polarized magnet 13 in the opposite direction, whereby the locking pawl 16 is withdrawn from the teeth of the impulse mechanism, and this at the same time through the
110 agency of the projection 21 moves the step-

ping up pawl 20 from the teeth of the impulse mechanism, whereupon the spring 9 restores the impulse mechanism 7 to normal. In this condition none of the pawls are in engagement with the impulse mechanism.

The first impulse from battery 5 when it is desired to call any station in addition to operating the magnet 12, operates the magnet 13 to bring the pawl 16 into engagement with the teeth of the impulse mechanism, and the spring action of the pawl 20 then also permits it to engage said teeth. In the movement of the impulse mechanism according to the action of the pawl 20, the elasticity of the spring 16 allows it to move away from the bar, as said spring is fastened thereon at its right hand extremity by the rivet 17, as shown.

After the required number of impulses have been sent to bring the arm 10 into engagement with the spring 11, circuit is again closed at the central station and held in a closed position so that the armature 18 maintains a contact with the contact point 22 and thereupon circuit conditions are established from conductor 4 through armature 18, the ground, the arm 10, spring 11, slow acting relay 23, to the line conductor 3. If this circuit is maintained a given length of time, relay 23 will operate and close circuit through the local signal 24. Slow acting relay 23 has a copper shell 25 in order to provide this time element. Now, if after the same number of impulses have been sent, the circuit at the central station has not been again closed and no release impulses have been sent, then substation circuit conditions would be as follows: from the ground, through armature 18, back contact 26, battery 27, slow acting relay 28, spring 11, arm 10 and the ground. This will allow the magnet 23, which is slow acting on account of the weight 29, to close circuit through the second substation signal 30. It will thus be seen that with a given angular position of the impulse mechanism, signals 24 and 30 can be selectively operated. After the operation of the desired substation signals, a current impulse of opposite polarity is sent over the line wires, which operates magnet 13 in the opposite direction, thereby releasing pawl 16 and the thin spring pawl 20. The downward pressure of the thin spring pawl 20 is not sufficient to move the heavy armature 14. It will thus be apparent that normally when no signals are being sent the armature 14 is in such a condition

that the pawls 16 and 20 are disengaged from the teeth of the element 7. The first impulse is of the proper polarity to actuate the arm 14 so as to bring the pawls 16 and 20 into engagement with the teeth of the element 7. The succeeding impulses are of the same polarity so that the armature 14 does not change its position between impulses and the pawl 16 thereupon serves as a holding and retaining means for the said element 7. After the call has been completed and the proper signal 24 or 30 actuated, an impulse of reverse polarity is transmitted over the wires 3 and 4 which actuates the armature 14 to disengage the pawls 16 and 20 from the teeth of the element 7, thereby permitting said element to return to normal against the stop 8. The pawls maintain this disengaged position until impulses of the proper polarity are again transmitted over the wires to send a call for any given signal at any given station.

While I have herein shown and particularly described one embodiment of my invention, I do not limit myself to the precise construction and arrangement as herein set forth, but

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A selective signaling system having a central station and substation, means at the central station for transmitting electrical impulses, and a signal receiving device at each substation having a step-by-step element, a step-up pawl for said element, electro-magnetic means to operate said pawl, a holding pawl for said element, both of said pawls being normally disengaged from said element, and polarized electro-magnetic means to control said holding pawl and said step-up pawl.

2. A step-by-step signal receiving device having a step-by-step element, a step-up pawl for said element, electro-magnetic means to operate said pawl, a holding pawl for said element, both of said pawls being normally disengaged from said element, and polarized electro magnetic means to control said holding pawl and said step-up pawl.

In witness whereof I hereunto subscribe my name this 16th day of March A. D., 1910.

CHARLES STANLEY RHODS, JR.

Witnesses:

MAX W. ZABEL,
HAZEL JONES.