

W. P. NEUBERT & W. H. McCLELLAND, Jr.
RAILWAY SIGNALING APPARATUS.
APPLICATION FILED DEC. 30, 1909.

992,236.

Patented May 16, 1911.

3 SHEETS—SHEET 1.

Fig. 2.

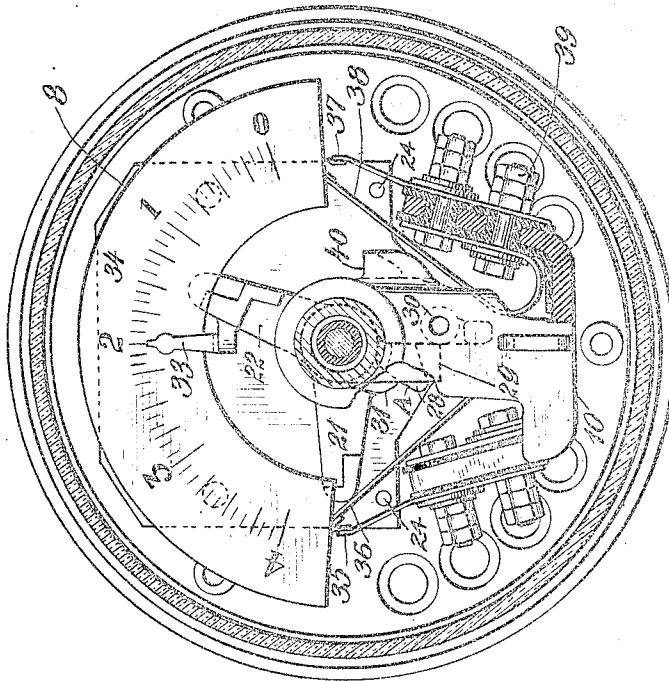
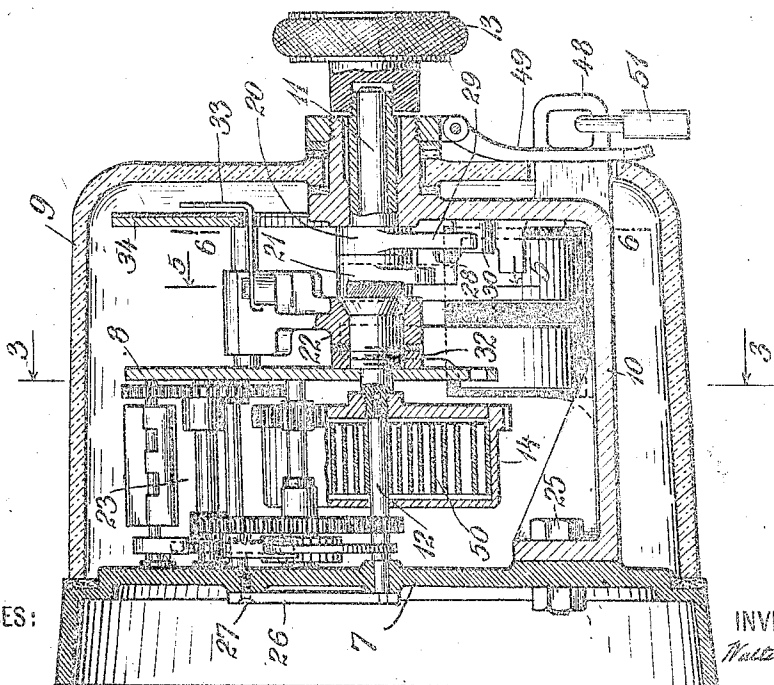


Fig. 1.



WITNESSES:

a. l. Verrill
M. S. Kirkland

INVENTORS

Walter P. Neubert

William H. McClelland, Jr.

BY

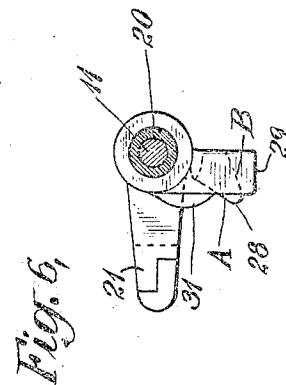
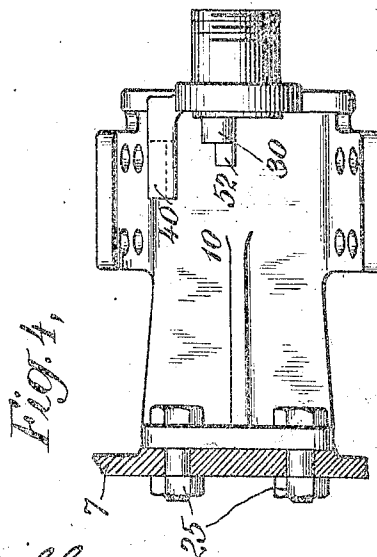
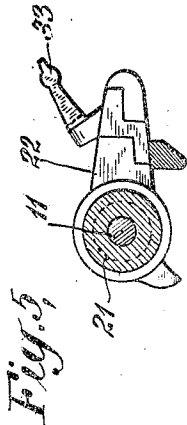
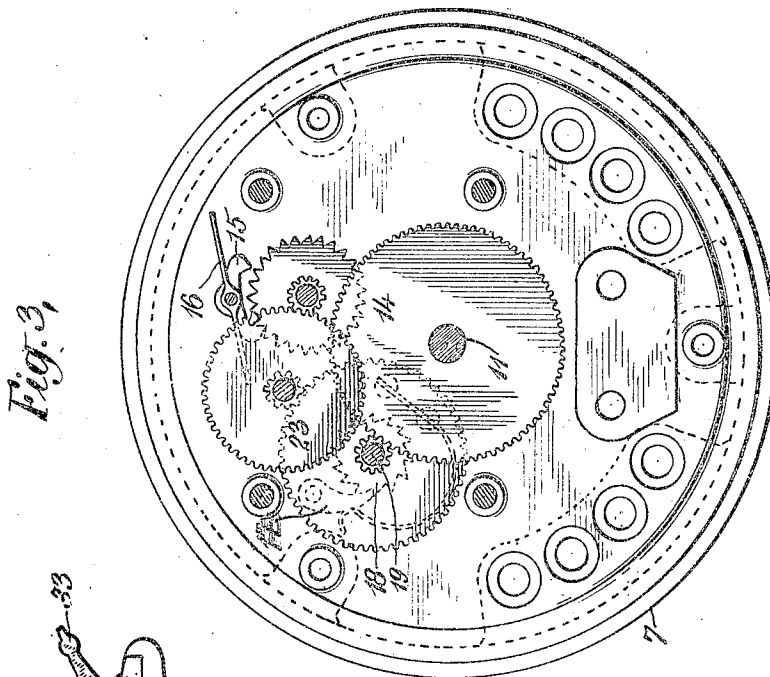
R. E. Brown
ATTORNEY

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3 SHEETS—SHEET 2.



WITNESSES:

a. L. Verrill
W. H. McClelland Jr.

INVENTOR

Walter P. Neubert
William H. McClelland Jr.

BY

Frederic E. Spruce
their ATTORNEY

W. P. NEUBERT & W. H. McCLELLAND, JR.
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3 SHEETS—SHEET 3.

Fig. 8.

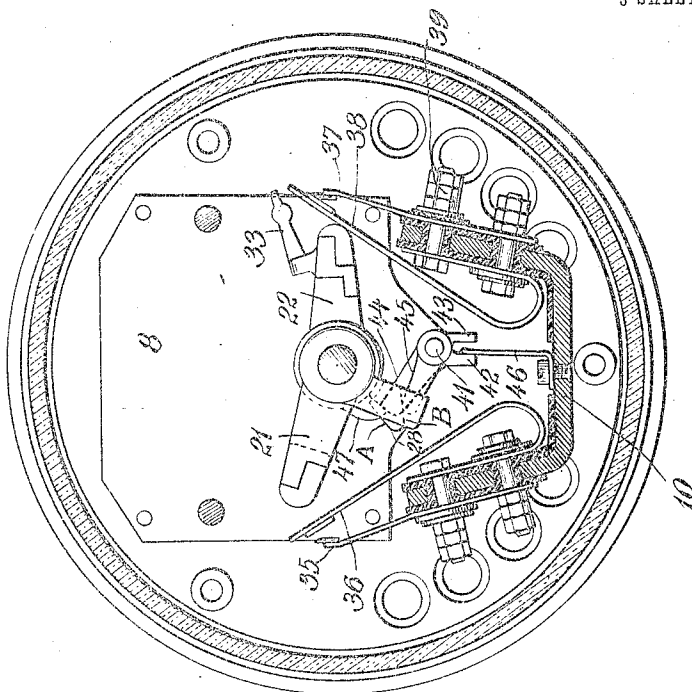
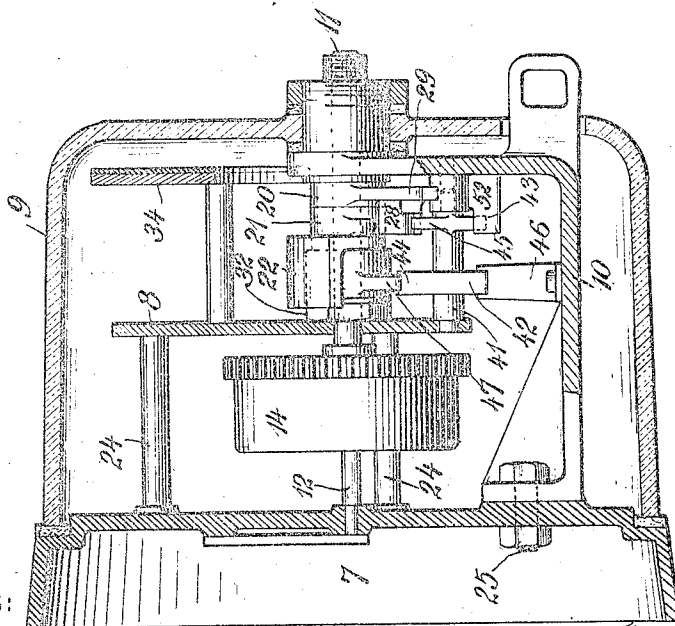


Fig. 7.



WITNESSES:

A. L. Verrill
M. S. Kirkland

INVENTOR

Walter P. Neubert
William H. McClelland Jr.

BY

Geo. E. Brown
ATTORNEY

UNITED STATES PATENT OFFICE.

WALTER P. NEUBERT, OF SWISSVALE, AND WILLIAM H. McCLELLAND, JR., OF WILKINSBURG, PENNSYLVANIA, ASSIGNORS TO THE UNION SWITCH AND SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

RAILWAY SIGNALING APPARATUS.

992,236.

Specification of Letters Patent.

Patented May 16, 1911.

Application filed December 30, 1909. Serial No. 535,613.

To all whom it may concern:

Be it known that we, WALTER P. NEUBERT and WILLIAM H. McCLELLAND, Jr., citizens of the United States, residing, respectively, in the boroughs of Swissvale and Wilkesburg, county of Allegheny, State of Pennsylvania, have invented certain new and useful Improvements in Railway Signaling Apparatus, of which the following is a specification.

Our invention relates to apparatus for the control of railway signals, and more particularly to time release mechanisms.

One object of our invention is to provide a time release mechanism which shall be entirely automatic in its action, not requiring the attention of an operator other than to turn a knob through a small angle each time the mechanism is used, and which will not permit of any variation in the time element by manipulation of this knob by the operator.

Another object is the provision of a time release mechanism in which the length of time for release is readily adjustable to any desired amount, the time being indicated by a pointer moving over a graduated dial.

We accomplish the objects of our invention by the use of a clockwork mechanism which drives an escapement, for producing the time element.

We will describe a form of apparatus embodying our invention, and then point out the novel features in claims.

Referring to the accompanying drawings, Figure 1 is a side elevation, partly in section, showing a form of time release apparatus embodying our invention. Fig. 2 is a front elevation, partly in section, of the apparatus shown in Fig. 1. Fig. 3 is a sectional view on the line 3-3 of Fig. 1. Fig. 4 is a plan view of a portion of the apparatus shown in the preceding views. Fig. 5 is a sectional view of a portion of the mechanism on the line 5-5 of Fig. 1, and Fig. 6 is a sectional view of a portion of the mechanism on the line 6-6 of Fig. 1. Figs. 7 and 8 are side and front elevations, respectively, partly sectioned, of a modification of the apparatus shown in Figs. 1 and 2.

Similar reference characters refer to similar parts throughout the several figures.

In the accompanying drawings the reference character 7 designates a base plate

upon which the various parts are mounted. A clockwork mechanism 23 is mounted between the base-plate 7 and a plate 8, the latter being mounted on spacing studs 24, in a manner similar to the ordinary clock movement. A main-spring 50 for actuating the clock-work mechanism is inclosed in a spring cage 14, the inner end of the spring being secured to a shaft 12, and the outer end to the inside surface of the cage 14. This clockwork comprises a train of gears driving an escapement pawl 15 to which is secured a damper or fan 16 for the purpose of increasing and regulating the time element of release.

A bracket 10, secured to the base plate 7 by bolts 25, acts as a bearing for one end of a shaft 11, the other end of the shaft being supported in the plate 8. A plan view of this bracket is shown in Fig. 4. This shaft 11 is rigidly secured to the spring cage 14. The inner end of the shaft 11 also acts as a bearing for one end of the spring shaft 12, the other end of this shaft being supported in the base plate 7. A crank 26, secured to the shaft 12, serves to wind up the main-spring when the apparatus is originally set up, after which this crank is held from rotating by being secured to the base plate 7 by means of a screw 27. No further winding of the main-spring is necessary, other than that which automatically takes place each time the device is used. The shaft 11 is not journaled directly in the bracket 10, but turns freely within a sleeve or auxiliary shaft 20, which itself turns freely in the bracket 10. Secured to the outer end of this sleeve 20 is a knob 13 by means of which the sleeve may be rotated. A contact arm 21 is secured to the shaft 11, and is the only part of the mechanism secured to this shaft directly with the exception of the spring cage 14. Another contact arm 22 fits loosely over the arm 21, and can be secured thereto by means of a nut 32. By this arrangement the arms 21 and 22 may be adjusted to any desired angle relatively to each other, and the two may then be rigidly clamped together by means of the nut 32. A conical surface on arm 21 matching with a correspondingly conical recess in arm 22 facilitates this clamping. Projecting from the sleeve 20 is a lug 28, the face A of which may engage with a shoulder 31 projecting from the shaft

portion of contact arm 21. Thus when the knob and sleeve 20 are rotated in a clockwise direction they carry with them the arms 21 and 22, and the shaft 11 to which the arms are secured.

Secured near the outer end of contact arm 22 is a pointer 33 which moves over a graduated dial 34.

Mounted upon the bracket 10, and suitably insulated therefrom are contact springs 35, 36, 37 and 38, to which electrical circuits may be connected by means of terminal posts 39. These contact springs are arranged in pairs, the pair 35 and 36 being closed when pressed together by contact arm 21, and the pair 37 and 38 being similarly closed when pressed together by contact arm 22. In the drawings we have shown two sets of contact springs on each side, although the apparatus may be designed to accommodate any desired number of springs, depending upon the number of circuits to be controlled. The pressure of the contact arms upon these springs is limited by stops, the movement of the arms in one direction being limited by a lug 29 on the sleeve 20 engaging a stop 30 on the bracket 10, and in the other direction by the arm 22 engaging a lug 40 on the bracket 10.

The entire mechanism is protected from improper operation and from dirt by a glass cover 9 which may be locked in place by means of a pad-lock through a staple 48.

The operation of the apparatus is as follows: Assuming the mechanism to be assembled and the main spring to have been originally wound by means of the crank 26, the normal position of the parts will be as shown in Fig. 2; springs 35 and 36 being closed and springs 37 and 38 open. When a release is desired, the knob 13 is rotated in clockwise direction by the operator until stopped by contact arm 22 engaging the stop 40. Springs 37 and 38 will then be closed. Upon releasing the knob, the clockwork mechanism will operate to return the contact arms to their normal position shown in Fig. 2, the length of time required for the return depending upon the angle of adjustment between contact arms 21 and 22. As shown in the accompanying figures, this time is 2 minutes. The time which has elapsed since the arms left their wound-up position may be read at any instant during the release by the position of the pointer on the dial. During the process of winding by means of the knob, the clockwork mechanism beyond the shaft 19 is detached from the spring cage by a pawl 17 and ratchet wheel 18. That is, while the spring cage 14 is being rotated by hand in a clockwise direction, the shaft 19 and ratchet 18 are rotated counter-clockwise, so the pawl slips over the teeth of the ratchet without engagement. When, however, the main spring

is actuating the mechanism, the directions of rotation are reversed and the pawl engages the teeth of the ratchet.

The time release apparatus which we have just described may be termed a "normally unwound" type; that is, when not in actual use the mainspring is normally unwound as far as any winding on the part of the operator is concerned, and the contact arms rest normally in contact with the stop 30, springs 35 and 36 being closed. Another type of the release apparatus is sometimes desirable, in which the mainspring is normally wound up to its fullest extent, springs 37 and 38 being closed by the contact arms resting normally against the stop 40 until released by a slight movement on the part of the operator. To accomplish this purpose we use a modification of our invention, shown in Figs. 7 and 8. The parts of the apparatus are precisely the same as in the type hereinbefore described, with the addition of a lock shaft 41 and a spring 46. This shaft carries four lugs 42, 43, 44 and 45 which engage with other parts of the mechanism as follows: When the knob is turned in a clockwise direction by the operator to wind the spring, as hereinbefore described, a shoulder 47 on contact arm 22 is engaged by the lug 44 carried on lock shaft 41, and the rotating parts are thereby held in the wound-up position as shown in Fig. 8. The contact arms may be released, however, when a reverse rotation is desired, by turning the knob 13 backward, whereupon the face B of the lug 28 carried by the sleeve 20 presses downward on the lock shaft lug 45, rotating the lock shaft 41 through a small arc, thus permitting the shoulder 47 to pass by the lug 44, and the contact arms to begin their backward movement under the action of the main spring. The lock shaft is held by a spring 46 in such a position as to be ready to engage the contact arms when they are again rotated by means of the knob 13, and it is prevented from being rotated too far under the action of the spring 46 by a shoulder 52 on the bracket 10 which engages with lug 43 on the lock shaft. This "normally wound" type of our time release apparatus may be used at any time as a "normally unwound" type, the only difference in operation being that immediately after winding the spring by a clockwise rotation of the knob, the operator must give the knob a slight backward rotation, whereupon the contact arms will be at once released and driven backward by the main-spring in the usual manner. Furthermore the apparatus may be readily changed from the normally wound type to the normally unwound, or vice versa, by the simple insertion or removal of the lock shaft 41 and its spring 46.

The time-release apparatus embodying

our invention may be operated in two ways: (a) by hand, as hereinbefore described; and (b) by mechanical attachment to a lever of a hand operated or power operated interlocking machine. When hand operated, the retaining lock shaft is used if the device is to be normally wound up, and not used if normally unwound. The arrangement of circuits will determine in each case which form is to be used. When operated by attachment to an interlocking machine, the retaining lock-shaft is, of course, never used. The apparatus may be changed on the ground from hand operated to mechanically operated, or vice versa, by interchanging the knob with a suitable lever attachment.

It will be noted that the slow-releasing feature of the apparatus of our invention is entirely automatic in its action, the time required for a complete movement from the wound-up position to the run-down position depending only upon the angle of adjustment between the contact arms. Under no circumstances is the operator able by turning the knob backward, to vary the time required to effect a release.

Having described our invention, what we claim is:

1. A circuit controlling device comprising two oppositely arranged sets of contacts, two arms adapted for engagement respectively with the two sets of contacts, means for rotating said arms in one direction at a constant angular velocity from engagement with one set of contacts to engagement with the other set of contacts, and means for varying the angle between the two arms and thereby varying the period of time consumed in the said rotation.

2. A circuit controlling device comprising two oppositely arranged sets of contacts, two arms adapted for engagement respectively with the two sets of contacts, means for rotating the arms in one direction from engagement with one set of contacts to engagement with the other set of contacts, means for varying the angle between the two arms and for thereby varying the period of time consumed in the said rotation, a speed regulating device for controlling the speed of said rotation, and means for rendering the speed-regulating device inoperative during a rotation of the arms in the opposite direction.

3. A circuit controlling device comprising two oppositely arranged sets of contacts, two arms adapted for engagement respectively with the two sets of contacts, means for rotating said arms in one direction from engagement with one set of contacts to engagement with the other set of contacts, and a motor device, independent of the said means, for rotating the arms at a constant angular velocity in the other direction.

4. A circuit controlling device comprising

two oppositely arranged sets of contacts, two arms adapted for engagement respectively with the two sets of contacts, means for rotating said arms in one direction from engagement with one set of contacts to engagement with the other set of contacts, a motor device, independent of the said means, for rotating the arms in the opposite direction, a speed-regulating device for controlling the speed of the said motor device, and means for rendering the said speed regulating device inoperative during a rotation of the arms in the first-mentioned direction.

5. A circuit controlling device comprising two oppositely arranged sets of contacts, two arms adapted for engagement respectively with the two sets of contacts, means for rotating said arms in one direction from engagement with one set of contacts to engagement with the other set of contacts, a motor device independent of said means, for rotating the arms at a constant angular velocity in the opposite direction, and means for varying the angle between the said arms and thereby varying the period of time consumed in the rotation by the motor device.

6. A circuit controlling device comprising two oppositely arranged sets of contacts, two arms adapted for engagement respectively with the two sets of contacts, a device for rotating the arms at a constant angular velocity in one direction from engagement with one set of contacts to engagement with the other set of contacts, a pointer rotating with the said arms to indicate the progress of time during the said rotation, and means for varying the angle between the two arms and thereby varying the period of time consumed in the said rotation.

7. A circuit controlling device comprising two oppositely arranged sets of contacts, a shaft carrying two arms adapted for engagement respectively with the two sets of contacts, a slow-acting motor device for rotating said shaft in one direction and thereby rotating the arms from operative engagement with one set of contact fingers to operative engagement with the opposite set of contact fingers and means for varying the angle between the two arms and for thereby varying the period of time consumed in the said rotation.

8. A circuit controlling device comprising two oppositely arranged sets of contacts, a shaft carrying two arms adapted for engagement respectively with the two sets of contacts, means for rotating said shaft in one direction at a constant angular velocity and thereby rotating the arms from engagement with one set of contacts to engagement with the opposite set of contacts, and means for varying the angle between the two arms and thereby varying the period of time consumed in the said rotation.

9. A circuit controlling device comprising two sets of electric contacts, each set comprising a stationary member and a movable member adapted for engagement therewith, a shaft carrying the movable members, a motor device for rotating said shaft in one direction at a constant angular velocity and thereby rotating the movable members from engagement with one stationary member to engagement with the other stationary member, and means for varying the angle be-

tween the two movable members and thereby varying the period of time consumed in the said rotation.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribed witnesses.

WALTER P. NEUBERT.

WILLIAM H. McCLELLAND, JR.

Witnesses:

F. L. WALTON,

T. GEO. WILLSON.