

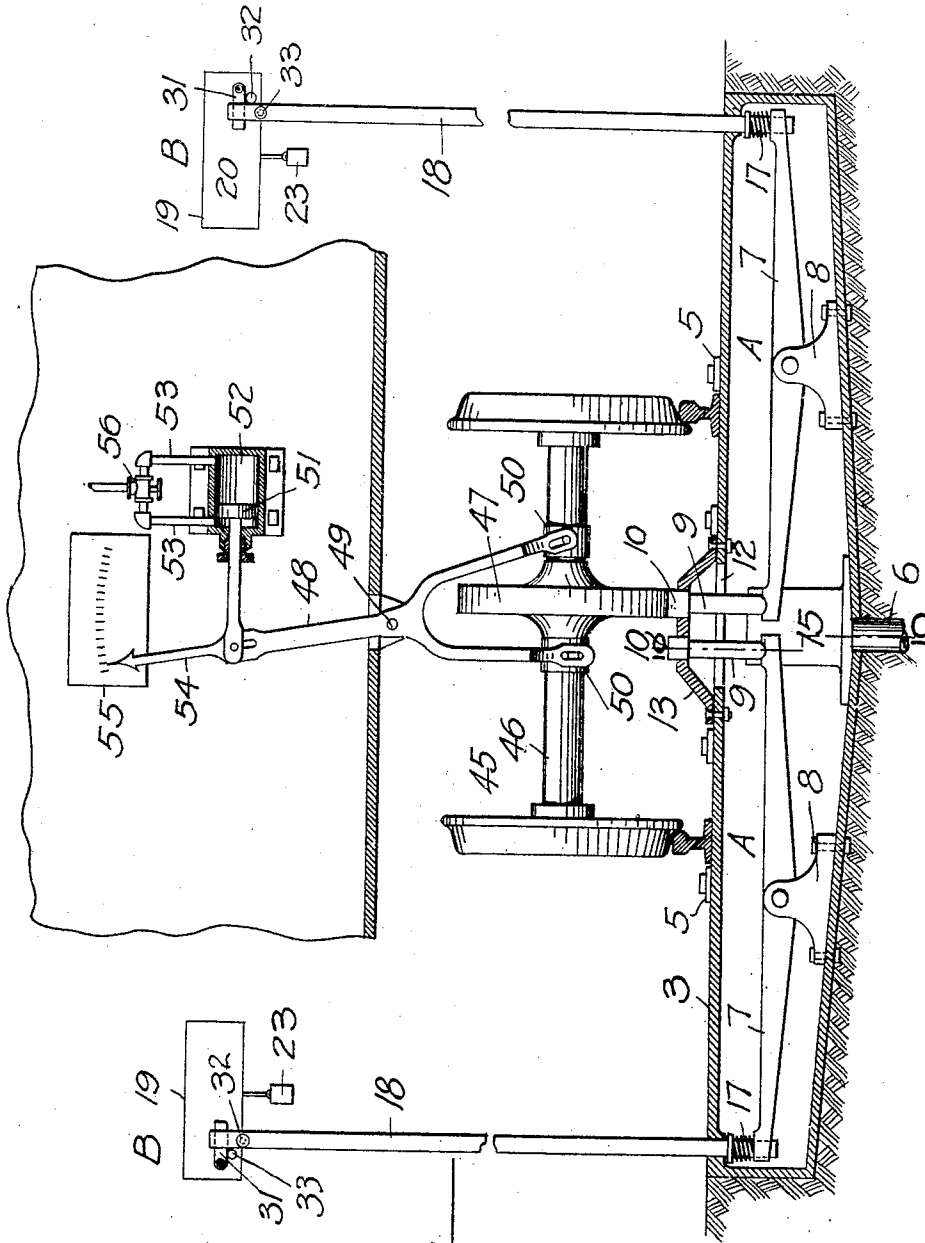
T. MACDOUGAL & J. McK. CHAMBERS.  
TRACK INSTRUMENT FOR SIGNALING SYSTEMS.

APPLICATION FILED APR. 20, 1909.

964,530.

Patented July 19, 1910.

3 SHEETS--SHEET 1.



**WITNESSES:**

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Fig.

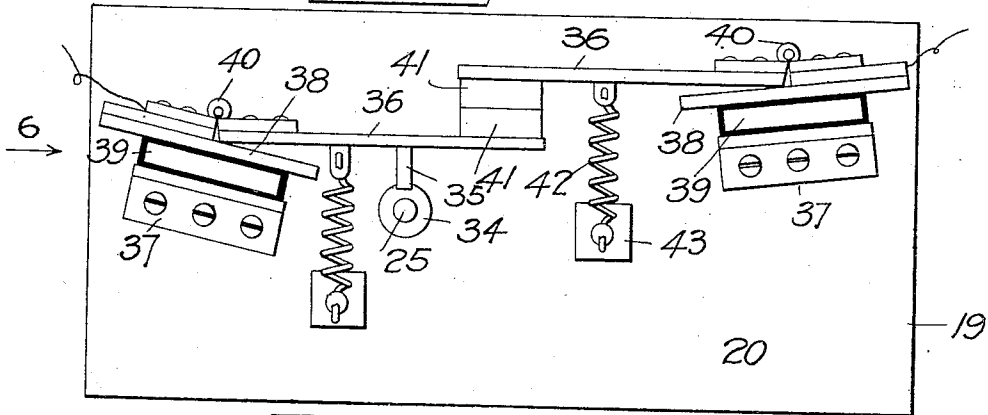
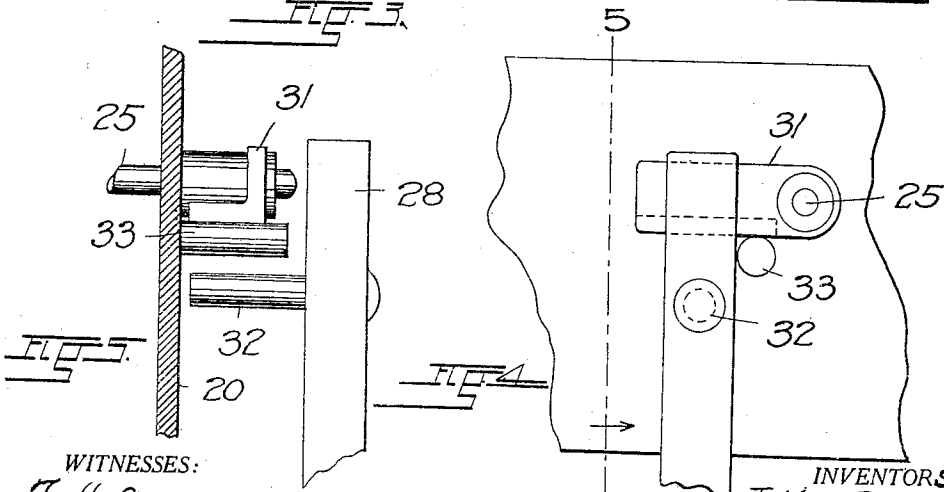




Fig. 5.



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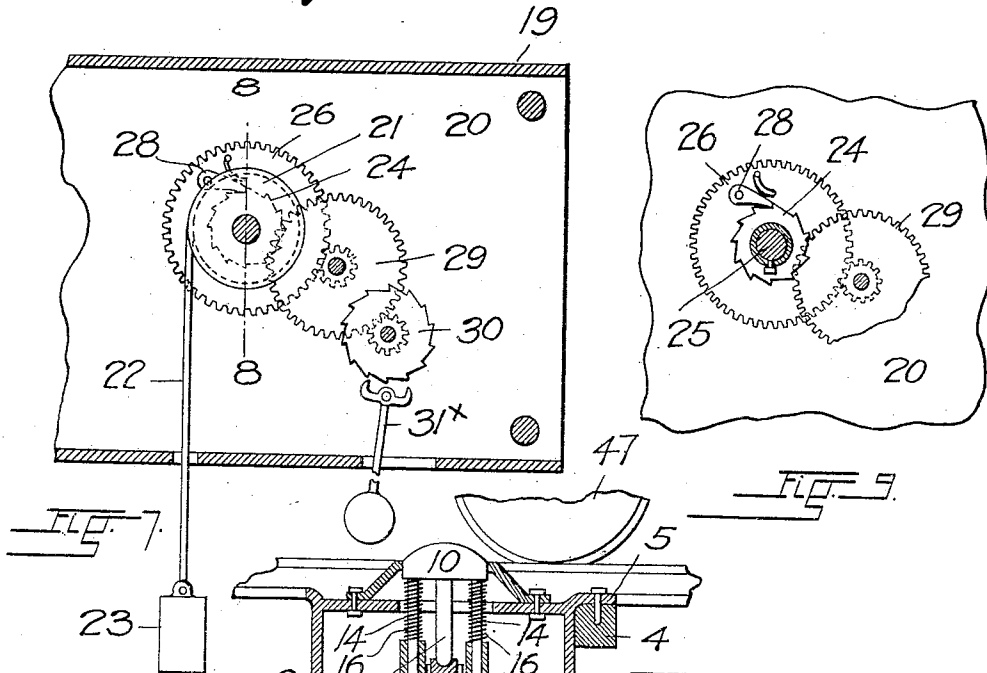
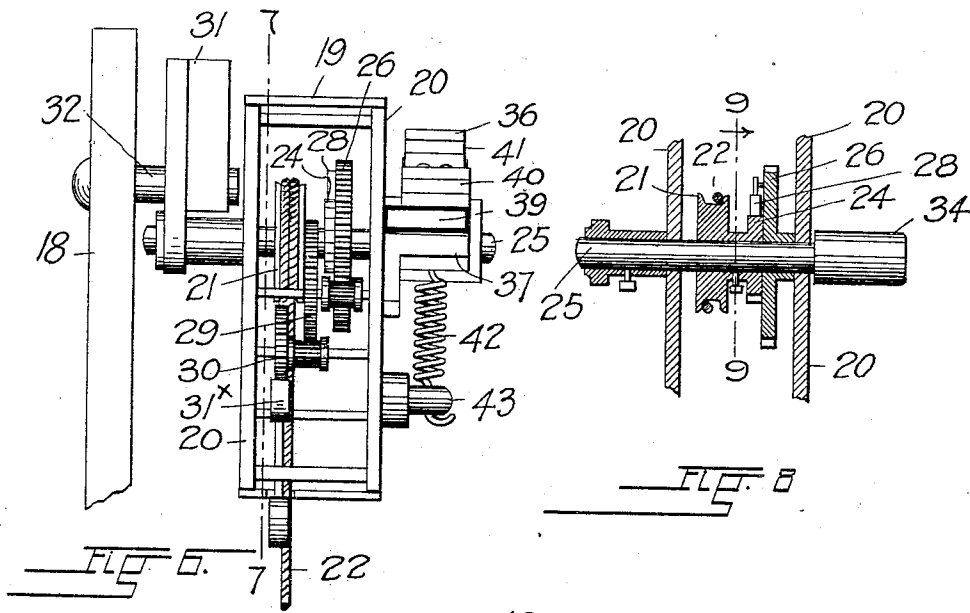
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3 SHEETS—SHEET 3.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

THOMAS MACDOUGAL AND JAMES MCKINNON CHAMBERS, OF BOULDER, COLORADO.

## TRACK INSTRUMENT FOR SIGNALING SYSTEMS.

964,530.

Specification of Letters Patent.

Patented July 19, 1910.

Application filed April 20, 1909. Serial No. 491,191.

*To all whom it may concern:*

Be it known that we, THOMAS MACDOUGAL and JAMES M. CHAMBERS, citizens of the United States of America, residing at Boulder, in the county of Boulder and State of Colorado, have invented certain new and useful Improvements in Track Instruments for Signaling Systems, of which the following is a specification.

This invention relates to track instruments for use in railway signaling systems and its object is to provide a simple and effective mechanism whereby an electric circuit for operating a signal is closed by a passing train, said circuit being preserved through a period of any desired length.

The invention consists, to this end, of two coöperative elements, one of which comprises a lever system adapted to be operated by a passing train while the other includes a circuit closing device controlled by a clock work which is actuated through the instrumentality of said lever system.

Two identical circuit closing devices and lever systems are, in practice, disposed at opposite sides of the track, to be respectively actuated by trains running in opposite directions.

In the accompanying drawings, in the various views of which like parts are similarly designated, Figure 1, represents a sectional view of a railway track, showing the circuit closing devices in operative position, together with a car truck which carries the mechanism by means of which the lever system included in our invention is actuated, Fig. 2, a side elevation of the circuit closing element included in the invention, with the contacts in the normal position when the electric circuit is open, Fig. 3, a similar view showing the contacts in the position in which the circuit is closed, Fig. 4, a fragmentary view of the reverse side of the element, Fig. 5, a transverse section along the line 5—5 Fig. 4, Fig. 6, an end view of the circuit closing element looking in the direction of the arrow 6 Fig. 3, Fig. 7, a section along the line 7—7 Fig. 6, Fig. 8, a fragmentary, transverse section along the line 8—8 Fig. 7, Fig. 9, a fragmentary section along the line 9—9 Fig. 8, and Fig. 10, a transverse section taken along the line 10—10 Fig. 1.

The elements A, comprising the lever sys-

tems of the two track instruments which, as stated hereinbefore, are placed at opposite sides of the track to be actuated by trains passing from opposite directions, are preferably inclosed in a common housing which is supported between two ties of the railway in transverse relation to the track.

The ties have been designated in Fig. 10 of the drawings by the reference numeral 4, and the casing 3 is shown in the same figure, to be constructed with lugs 5, which rest upon the upper surface of said ties. The bottom of the casing 3, which is preferably embedded in cement or other plastic material, slopes from its ends toward its center where a conduit 6 is applied for the purpose of draining water which may have entered the casing through the openings in its upper surface which extends flush with the upper surfaces of the ties.

Each element A comprises a lever 7, disposed longitudinally in relation to the casing and fulcrumed upon a bearing 8 which is secured upon the bottom thereof. The inner extremity of the lever is engaged by the lower end of a stem 9 forming part of a button 10 which protrudes through a slot 12 in the upper surface of the casing and whose upper edge forms a curve the vertex of which projects, normally, above the upper surfaces of the rails of the track. A slotted cap 13 secured over the slotted portion of the casing, serves to guide the button 10, during its vertical movement, and to exclude water and dirt from the interior of the casing. The button 10 is furthermore provided with two guide-pins 14 which depend parallelly to the stem 9 and whose lower ends project into corresponding bores of a casting 15, which is supported upon or, if so desired, may form part of the bottom of the casing 3. Coiled springs 16 surrounding the pins 14 in engagement with the upper surface of the casting 15 and the lower edge of the button, are designed to resiliently maintain the latter in its normal, protruding position. The opposite arm of the lever 7 connects, by means of a short, coiled spring 17, with the lower end of a vertically movable rod 18, which projects through a corresponding opening in the top of the casing.

The upper extremity of the rod 18 is operatively associated with the circuit closing

element B included in our invention, said element being preferably, secured upon a post or other elevated structure not shown in the drawings, and it will be understood that the rod 18, is guided, during its reciprocating movement in suitable bearings which being secured to said structure are obviously omitted in the illustration. The element B comprises a rectangular casing 19, the parallel sides 20 of which support a clock work which serves to retard the breaking of the circuit closed by the upward movement of the rod 18. The clock work includes a sheave 21 which carries in its peripheral groove, a rope 22 whose lower end is attached to a weight 23. The sheave 22 is, together with a ratchet wheel 24, fixedly secured upon an arbor 25 whose ends project through openings in the plates 20 in which it is revolvably supported. A gear wheel 26, loosely mounted upon the arbor 25, carries a spring-held pawl 28, which engages the teeth of the ratchet wheel 24, and said wheel connects coöperatively by means of a gear train 29, with an escape wheel 30, the peripheral teeth of which are engaged by the pallets of an oscillatory anchor-shaped verge 31\*. The arbor 25 carries upon one of its protruding ends a laterally extending arm 31 which, normally, projects in the path of a pin 32 on the reciprocating rod 18. A stop 33 secured upon the adjacent plate 20 of the casing 19, serves to support the arm 31 in its normal, substantially horizontal position and to, consequently prevent excessive retrograde movement of the clock work. The opposite extremity of the arbor 25, which likewise protrudes beyond the adjacent plate 20 of the casing, carries a sleeve 34 formed with a radially extending rib 35 which constitutes a cam by means of which the revolvable movement of the arbor is transmitted to one of two contact arms 36 which are hingedly mounted upon the outer surface of the plate 20. The latter is, to this end, provided near its ends with two brackets 37, each of which supports a bearing plate 38 which is separated from the brackets by means of a block of insulating material 39. The arms 36 are pivotally secured at one of their ends, upon the upper surfaces of the respective plates 38, by means of hinges 40, while their opposite, free extremities are provided with contact-blocks 41 which are preferably composed of carbon for the purpose of preventing "sparking" when the contacts are brought together.

When the arms 36 are in their normal position, they are supported upon the upper surfaces of the respective bearing plates 38, with their contact-bearing extremities in superposed relation to each other so that, when the lower arm 36 is moved about its pivot by the action of the cam 35, the contact as-

sociated therewith will engage that of the upper arm and subsequently cause the latter to turn upwardly and by its gravitative tendency, insure a perfect closing of the circuit. Coiled springs 42 whose ends connect with the respective arms 36 and with lugs 43 secured upon the casing, serve to resiliently maintain the former in their normal position of rest.

When by means of a projecting element on a passing train, one of the buttons 10 is depressed, the corresponding rod 18, will, through the instrumentality of the lever 7, move longitudinally upwardly and by contact of its pin 32, move the arm 31 from its normal horizontal position to the upright position shown in Fig. 6 of the drawings. The consequent revolvable movement of the arbor 25, through one fourth of a revolution, causes the rope 22 to be wound upon the sheave 21 while the contacts 41 are simultaneously brought in engagement by the action of the cam 35, as hereinabove described. When the button 10 is subsequently released, the rod 18 and the lever 7 will, by gravitation, return to their original position but the arbor 25, will be held against immediate retrograde movement by the engagement of the pawl 28 with the peripheral teeth of the ratchet wheel 24. The result is that the contact between the two contact pieces 41, is prolonged until, by the gravitative action of the weight 23, which is restrained by the gear train 29, and the escapement 30, the arm 31, is brought back to its original position in engagement with the stop 32. It will thus be observed that the length of time during which the circuit is closed, is independent of the period during which the track-button 10 is being depressed by the passing train, and that the electric circuit completed by the contact of the conducting blocks 41 may be preserved for a length of time, regulated by the weight 23, or the number of wheels in the train.

Although the means whereby the track-button is depressed may be of any suitable character, we preferably employ the mechanism illustrated in Fig. 1 of the drawings in which the numeral 45 designates the truck of a locomotive or other vehicle upon whose axle 46 a wheel 47 is laterally slidably mounted. A lever 48, fulcrumed at 49, has a forked lower arm whose bifurcated extremities contact with trunnions on collars 50 which encircle the axle of the truck, in engagement with opposite sides of the hub of the wheel 47. The upper arm of the lever 48 connects with the rod of a piston 51 which has a reciprocating movement in a cylinder 52, whose opposite ends connect by means of conduits 53, with a convenient source of motive fluid and the extreme portion of said upper arm terminates in a pointer 54 which, on a scale 55, indicates

the position of the wheel 47 relative to the two buttons 10, which are disposed at equal distance from the center of the track. A three way valve 56, at the point of connection of the conduits 53, enables the operator to change the position of the wheel in relation to the center of the track, when the direction of movement of the vehicle with which it is associated, is reversed.

10 It will be understood that under certain circumstances, for instance in case but one button is used, the downward movement of the latter may be effected by means of one of the truck-wheels of the engine and

15 although the proportions of the members included in the above described mechanism are immaterial, we preferably make the diameter of the wheel 47 equal to that of the wheel treads of the truck upon which it is

20 mounted which brings the upper surface of the cap 13 on a level with that of the rails.

Having thus described our invention what

we claim and desire to secure by Letters Patent is:—

A signaling system comprising a casing, 25 a shaft mounted therein, means for rotating the shaft, means for returning said shaft, means for retarding the return movement of the shaft, a contact mounted on the casing, said contact comprising a lower arm hinged 30 to the casing, and an upper arm also hinged to the casing, springs for holding said arms in their lower positions, and a projection on the shaft adapted to contact with the lower arm to force it into engagement with the 35 upper arm so as to raise both arms.

In testimony whereof we have affixed our signatures in presence of two witnesses.

THOMAS MacDOUGAL.  
JAMES MCKINNON CHAMBERS.

Witnesses:

JAMES COWIE,  
L. W. ALDRICH.