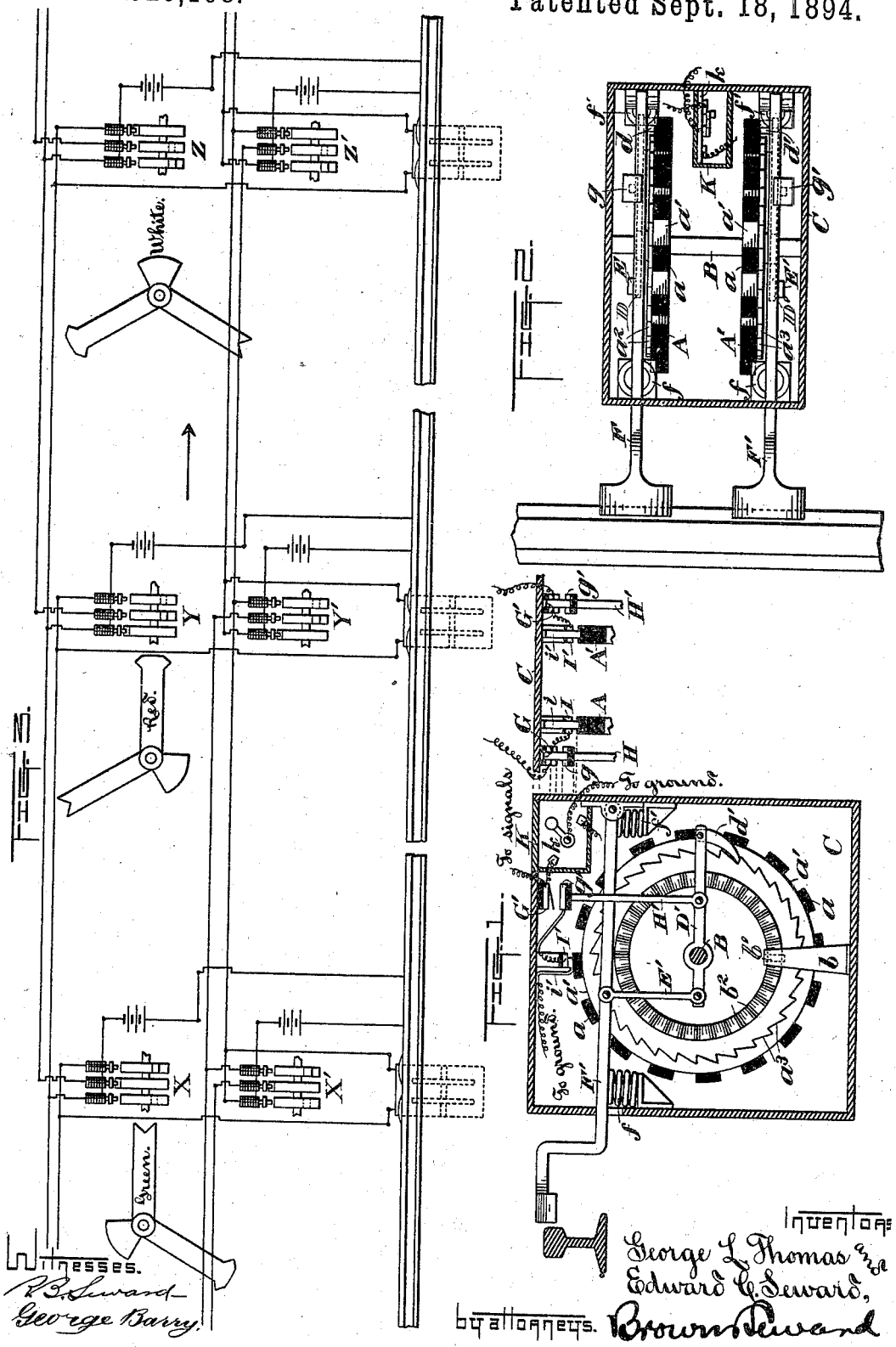
(No Model.)

G. L. THOMAS & E. C. SEWARD.

SIGNAL APPARATUS.

No. 526,168. Patented Sept. 18, 1894.



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SIGNAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 526,168, dated September 18, 1894.

Application filed January 22, 1894. Serial No. 497,689. (No model.)

To all whom it may concern:

Be it known that we, GEORGE L. THOMAS, of Brooklyn, in the county of Kings and State of New York, and EDWARD C. SEWARD, of Montclair, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Signal Apparatus, of which the following is a specification.

Our invention relates to an improvement in signal apparatus and more particularly to a track instrument under the control of a passing train to set the signals for that train without disturbing the signals for a train running in the opposite direction upon the same track; and at the same time under the control of the train running in the opposite direction on the same track to set its own signals without disturbing the signals of the first named train.

In the accompanying drawings, Figure 1 is view of a track instrument, showing the working parts in elevation and its casing in section in a plane transverse to the track. Fig. 2 is a top plan view, the top of the casing being removed; and Fig. 3 is a diagrammatical view, representing the track instruments conventionally and showing their connections with two series of rear signals, one for a train going in one direction and the other for a train going in the opposite direction along the same track, the said series of signals embracing features shown, described and claimed in our United States Patents Nos. 500,827 and 508,356.

The track instrument comprises a pair of wheels or disks A and A′ each provided, upon their peripheries, with alternate projections and recesses, the projections in the present instance being in the form of blunt teeth a separated by recesses a'. The two wheels or disks are mounted to rotate together and the projections or blunt teeth are correspondingly located on each of the two disks or wheels. In the present instance we have shown these wheels fixed to a shaft B, mounted to rotate freely within a protecting casing C. To prevent the wheels or disks from pitching too far under the impulse of their operating mechanism, to be hereinafter described, we provide a friction device which may consist of a spring arm b, fixed at one end to the casing or to a suitable support therein and at its opposite end provided with a nose b' adapted to rest in one of the annular series of shallow depressions b^2 on the side of the wheel. The shallow depressions b^2 are made to correspond to the projections and depressions on the periphery of the wheel, so that, while the wheel may be pushed forward; notwithstanding the pressure of the spring arm, the springing of the latter into one of the shallow depressions will prevent it from pitching forward farther than it is forced.

On the axle B, or in alignment with the axle, vibrating levers D and D′ are mounted, one for each wheel or disk, and are provided at one end with spring actuated pawls d, d' for engaging annular series of ratchet teeth a^2 and a^3, the former on the wheel A and the latter on the wheel A′. Series of ratchet teeth a^2 and a^3 correspond with the projections and recesses on the periphery of the wheels or disks, *i. e.* There is one ratchet tooth for each projection and each recess. The opposite arms of the levers D and D′ are connected by links E and E′ with treadle levers F and F′ pivoted to the casing of the track instrument, preferably at its side farthest from the track rail and extending thence, across within the casing, through slots and thence into such positions at the outer side of the track rail that the rim of the car wheel will depress them as the wheel travels along the rail. There are also, within the casing and in the present instance at its top, contact pieces G and G′, the former in position to make contact with a contact piece g, under the control of a plunger H, connected with the pawl carrying arm of the lever D, and the latter in position to make contact with a contact piece g', under the control of a plunger H′, connected with the pawl carrying arm of the lever D′. There are also contact pieces I and I′ in electrical contact with the pieces g and g' respectively and so located as to be brought into electrical contact with the conductors i and i', leading to ground, whenever the projections on the wheels or disks come opposite the contact pieces I and I′, but, when the recesses on the wheels or disks come opposite said pieces I and I′, then the electrical connection between the ground conduc-

tors i, i' and the contact pieces I, I' will be broken.

The structure and arrangement are such that when one of the treadles—F for example—is depressed, it will make contact between the parts G, g and, the wheels or disks being at the same time in position to close connection between the conductor i and the piece I, the signal circuit will be completed. The moment the wheel passes the treadle F, the latter will be returned under the impulse of a powerful spring or powerful springs f, f' sufficient, for example, to require a thousand pounds more or less to compress them; and, by the return movement of the treadle, the vibrating lever D—through its pawl d—will advance the wheels or disks A, A' so as to bring the recess a opposite the contact I and hence break the circuit. The same movement which has taken place with respect to the wheel or disk A, under the above action of the treadle F, has taken place on the wheel or disk A', so that the circuit through the ground conductor i' and the contact I' will be broken when the wheel which has just operated the treadle F reaches the treadle F'. In depressing the treadle F', there will be no completion of the signal circuit through the ground conductor i' and contact I' but, as soon as the wheel has passed the treadle F', permitting the latter to return to its normal position, it will have advanced the wheels or disks A and A' one step so that the circuit will now be completed through the ground conductor i and contact I and also another circuit through the ground conductor i' and contact piece I'. As this double action will take place for each wheel that passes over the two treadles, it follows that no matter how many wheels pass successively over and no matter in which direction they pass, the wheel acting upon the treadle which it first approaches will complete one electric circuit and break another and the wheel which last passes over the second treadle which it reaches will invariably set the mechanism into the position in which it was when first approached in either direction by the wheel.

For the purpose of illustrating one of the practical applications of this instrument, we have indicated two series of rear signals, one for a train going in a direction from left to right and operated by an electric circuit which is completed through the ground conductor i, contact I, contact g and contact G; and the other series for a train going along the same track in the direction from right to left and operated by an electric circuit complete through the ground conductor i', contact I', contact g' and contact G'. The first series includes three towers or stations, denoted by X, Y, and Z, and the second series includes three towers, denoted by X', Y', and Z'. Suppose, for example, a train to be traveling along the track from left to right and to have reached the position indicated by the arrow between the stations Y and Z; it will have set the signal at the station Y immediately behind it to red, and the signal at the station X, second behind it, to green. In passing over the track instrument at the station Z, it will close the electric circuit through the ground conductor i, contact piece I, &c., and in doing so will simultaneously set the signal at station Z to red, the signal at station Y to green, and the signal at station X to white, there being assumed at each of the electro magnets for releasing the signal operating disks in the several towers or stations, a ground connection including a battery.

For the reasons hereinabove particularly stated, the operation of the signals for the train, moving as indicated by the arrow, will have no effect upon the signals for the train moving in the opposite direction, but the several track instruments will be so left that a train running in the opposite direction on the same track will operate the instrument in the same manner as hereinabove set forth to set its signals without interfering in any manner with the other series of signals.

For purposes of adjusting any signal within a predetermined section along the line, when from any cause it has become deranged, we find it desirable to locate within the casing of the track instrument, at the point where the person in charge of such section of signals is located, a lock box K within which there is located a switch board k, with shunt wires leading to the several circuits, so that, by the intentional closing of one or another of the circuits the signals may be operated and brought to the proper adjustment.

Instead of shunt wires, special wires might be laid from the switch board to the signals. We have not illustrated such special wires herein, as it would only require ordinary skill to extend them from the switch board to any one of the signal operating means, as the particular case might demand.

It is obvious that numerous slight changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of our invention. Hence we do not wish to limit ourselves strictly to the construction herein set forth, but—

What we claim is—

1. The track instrument, comprising a plurality of circuit making and breaking devices, a track treadle for each of the circuit making and breaking devices and wheels or disks provided with projections and recesses mounted to move together and under the control of each one of the treadles to be advanced, the advancement of said wheels or disks by one of the treadles serving to break a signal circuit controlled by another of the treadles, substantially as set forth.

2. A track instrument, comprising a plurality of circuit making and breaking devices, a track treadle for each, movable contact pieces under the direct control of the treadles to close one break in each circuit and movable contact pieces indirectly under the con-

trol of the treadles to close a second break in each circuit, substantially as set forth.

3. A track instrument, comprising a plurality of circuit making and breaking devices for each of a plurality of signal circuits, a spring actuated treadle for each of the signal circuits, a rotary circuit making and breaking device for each signal circuit, the several rotary circuit making and breaking devices being under the control of each of the treadles and a second circuit making and breaking device for each signal circuit under the control of the treadle for that circuit, substantially as set forth.

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