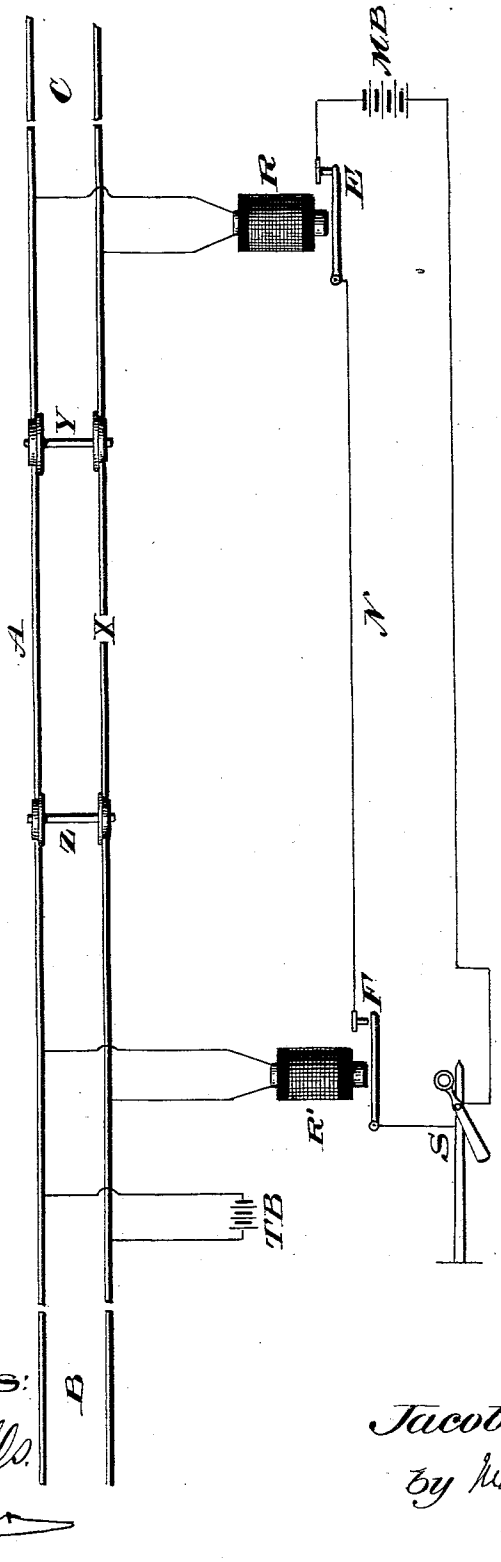
(No Model.)

J. W. LATTIG.

AUTOMATIC RAILWAY SIGNAL SYSTEM.

No. 560,102. Patented May 12, 1896.



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UNITED STATES PATENT OFFICE.

JACOB W. LATTIG, OF SOUTH BETHLEHEM, PENNSYLVANIA.

AUTOMATIC RAILWAY SIGNAL SYSTEM.

SPECIFICATION forming part of Letters Patent No. 560,102, dated May 12, 1896.

Application filed April 10, 1896. Serial No. 587,014. (No model.)

To all whom it may concern:

Be it known that I, JACOB W. LATTIG, of South Bethlehem, Pennsylvania, have invented a certain new and useful Improvement in Automatic Railway Signal Systems, of which the following is a specification.

My invention has relation to a system of automatic railway signaling in which the signal is controlled through the instrumentality of a relay included in a track-circuit or a circuit completed through the rails of the railway-track. Where a steam-railway runs in the neighborhood of an electric railway, it is well known that the leakage of electric current from the latter is apt to, and frequently does, charge the rails of the former, and that the difference of potential between the two lines of rails in the same track (the steam-railway track) is sometimes so great as to interfere with the proper working of a track-circuit. Indeed, cases have occurred where without any track-battery at all the difference of potential referred to has been sufficient to energize a track-relay included in a circuit completed through the track-rails. Thus in a block system, in which the train on the block short-circuits the track-battery and cuts out the track-relay, still supposing there should be a broken rail by which the train is held on the block, the signal behind the train might nevertheless show "clear" owing to the difference in potential between the unbroken line of rails on one side and the shorter broken line of rails on the other, which difference might readily be so considerable to set up a current sufficient to energize the track-relay, and thus return the signal to "safety."

It is my object to prevent any such occurrence and to provide means by which, so long as the train is on the block, it will be practically impossible to close the track-circuit. This result I attain by a combination and arrangement of instrumentalities which will first be explained by reference to the accompanying drawing, and will then be more specifically pointed out in the claim.

The drawing is a diagrammatic representation of so much of an automatic railway signaling system as needed for the purposes of explanation.

A is the track section or block insulated from the adjoining sections B C at *b* and *c*.

D is the ordinary track-circuit completed through the two lines of rails of track-section A and including a track-battery T B.

S is a signal of any ordinary or suitable character, which is operated in a well-known manner by instrumentalities controlled by an electric circuit—a signal-circuit N—containing a signal-battery M B and completed at E through contacts controlled by the relay.

The system thus far described is old and well known.

When the train, typified at Z, enters the block or section A, the track-relay R is short-circuited and the signal is operated to go to "danger;" but suppose the track is charged with current from a neighboring electric railway and that there is a break in one of the lines of rails at *x* in advance of the train. In this event, although the train is still on the block and is held there, yet the difference in potential between the two lines of track-rails in advance of the train may be sufficient to set up a current which will energize the relay, thus closing the signal-circuit, and consequently returning the signal to "clear," although the train is still on the block. To prevent any such occurrence, I interpose in the track-circuit a second or auxiliary relay R′ in parallel with relay R, and preferably of higher resistance than the latter, which auxiliary relay controls a set of contacts F, included also in the signal-circuit. Thus the signal-circuit includes two sets of contacts, both of which must be closed before the circuit can be completed. I also prefer to connect the auxiliary relay to the track at a point near the track-battery T B. Under this arrangement, with the train at Z, the track-battery will be short-circuited and the auxiliary relay R′ deënergized, with the effect of releasing its armature and opening the signal-circuit at F, as shown, notwithstanding the fact that, owing to the causes above adverted to, the relay R may be energized and the signal-circuit consequently closed at E. Now when the train finally passes beyond the break at X and is, say at Y, the current due to the difference of potential between the two lines of rails in advance of the break

will be at once shunted from relay R by the train, and consequently the signal-circuit will open at E, so that even if there should be a current set up through the rails in rear of the train sufficient to energize the auxiliary relay R' the signal-circuit will still be open and will remain so until the train quits the block. In this simple way the train is effectively protected throughout the whole length of the block.

Having described my improvement and the best way now known to me of carrying the same into effect, what I claim herein as new, and desire to secure by Letters Patent, is—

In automatic railway signal systems, the combination with a track-circuit and track-relay included therein, and a signal-circuit completed through a set of contacts controlled by the track-relay, of a second or auxiliary relay included also in the track-circuit and parallel with the main track-relay, and a second set of contacts included in the signal-circuit and controlled by said auxiliary relay substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 6th day of April, 1896.

JACOB W. LATTIG.

Witnesses:
EDWARD J. MALLOY,
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