(No Model.) 3 Sheets—Sheet 1.

B. C. ROWELL.

SAFETY SYSTEM FOR RAILROADS.

No. 554,957. Patented Feb. 18, 1896.

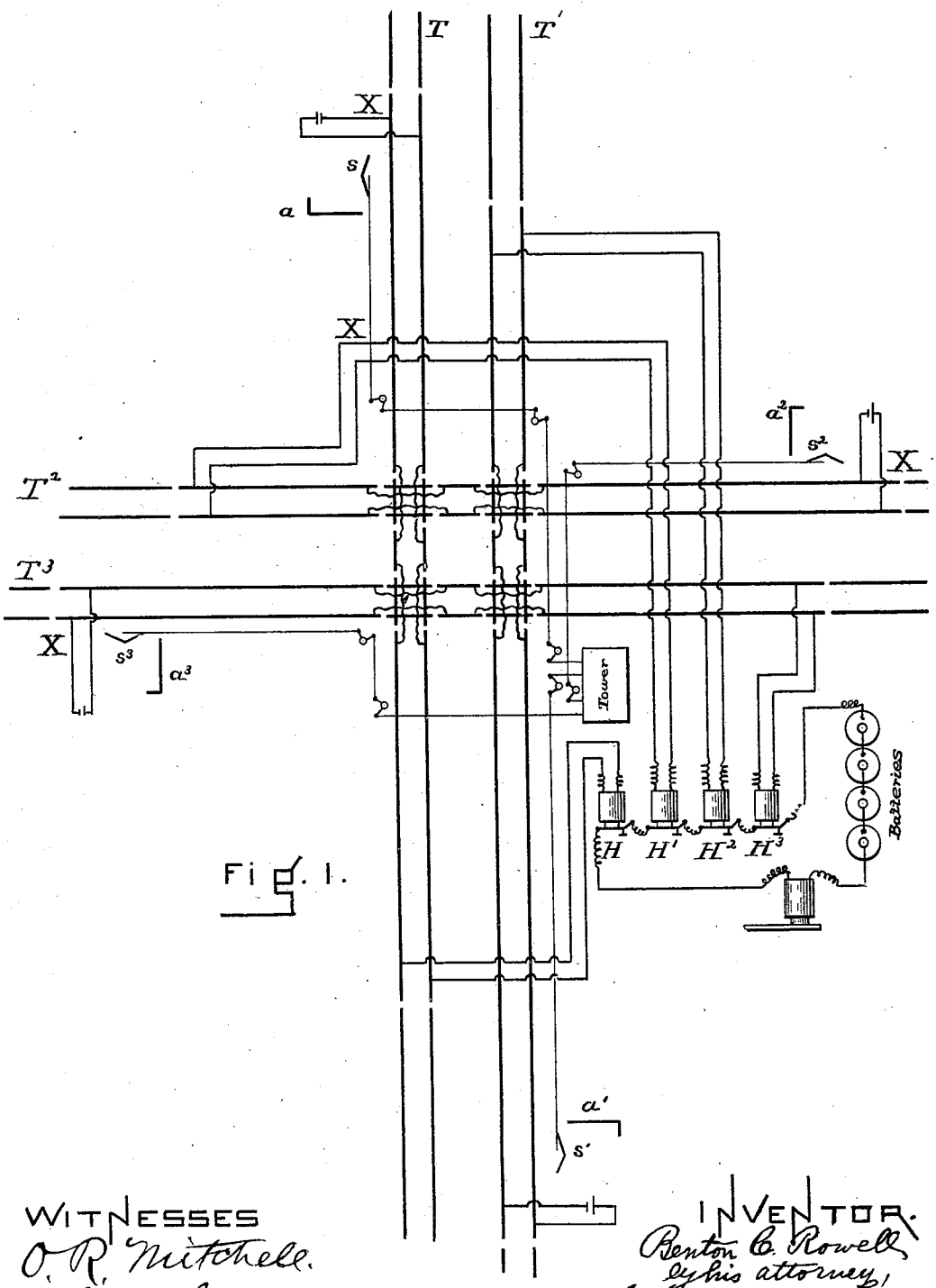

Fig. 1.

WITNESSES
O. R. Mitchell.
John R. Snow,

INVENTOR.
Benton C. Rowell
by his attorney,
J. L. Maynadier

ANDREW B. GRAHAM, PHOTO-LITHO WASHINGTON, D.C.

(No Model.) 3 Sheets—Sheet 2.

B. C. ROWELL.

SAFETY SYSTEM FOR RAILROADS.

No. 554,957. Patented Feb. 18, 1896.

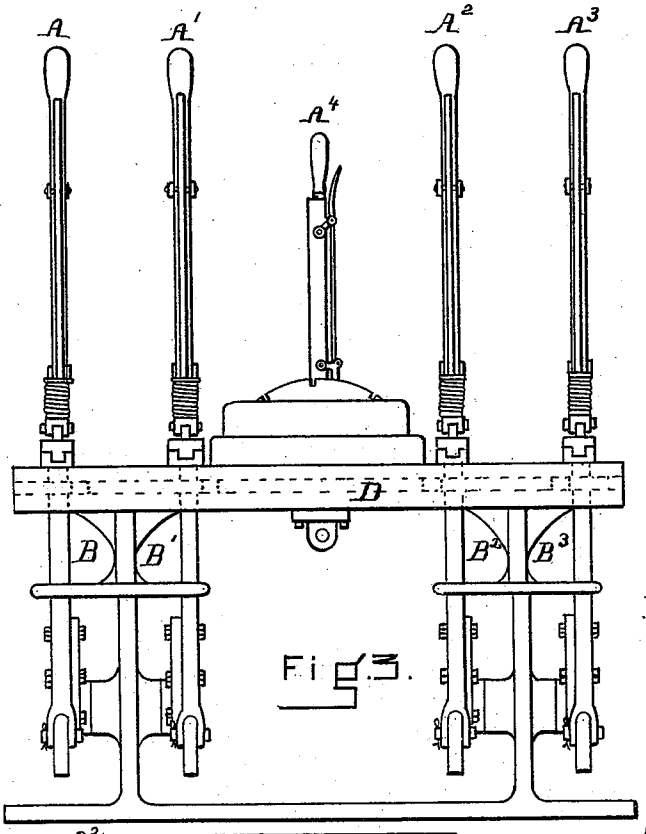

Fig. 3.

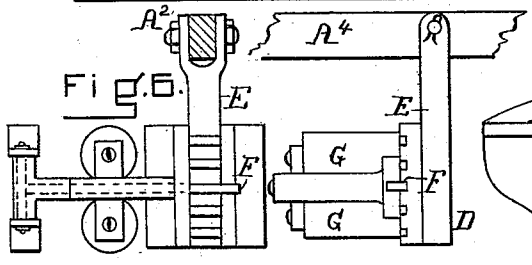

Fig. 6.

Fig. 9.

Fig. 7.

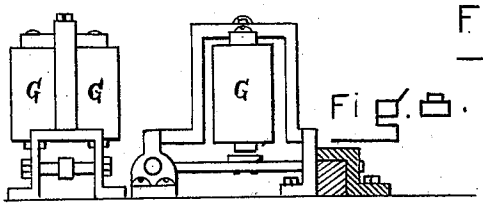

Fig. 8.

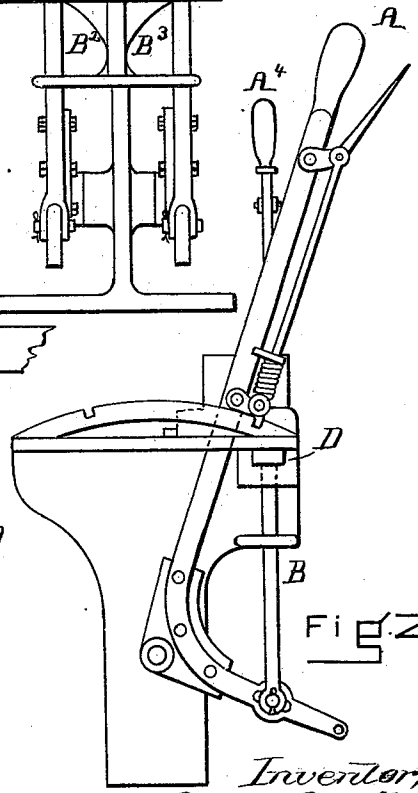

Fig. 2.

Witnesses;
J. Mott Lewis
O. R. Mitchell.

Inventor;
Benton C. Rowell
By his attorney
J. E. Maynadier.

ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D.C.

(No Model.) 3 Sheets—Sheet 3.

B. C. ROWELL.

SAFETY SYSTEM FOR RAILROADS.

No. 554,957. Patented Feb. 18, 1896.

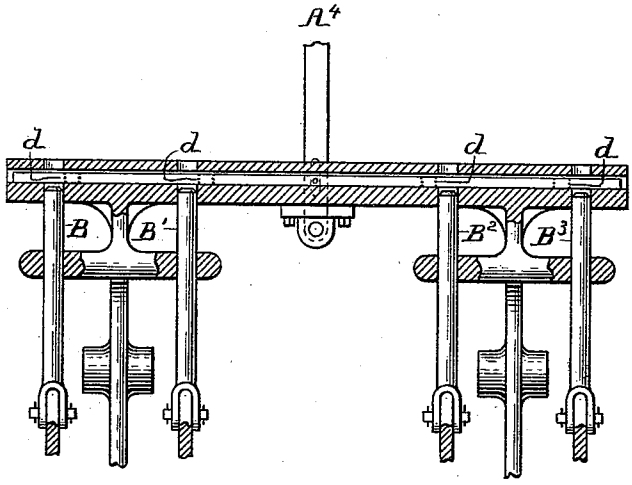

Fig 5.

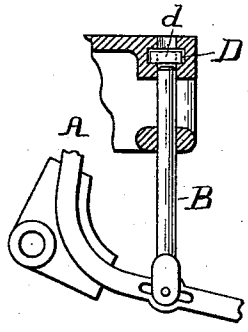

Fig 4.

WITNESSES
P. R. Mitchell.
John R. Snow.

INVENTOR
Benton C. Rowell,
by his attorney,
J. Ellwaynakin

ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D.C.

UNITED STATES PATENT OFFICE.

BENTON C. ROWELL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE ROWELL-POTTER SAFETY STOP COMPANY, OF PORTLAND, MAINE.

SAFETY SYSTEM FOR RAILROADS.

SPECIFICATION forming part of Letters Patent No. 554,957, dated February 18, 1896.

Application filed September 4, 1894. Serial No. 521,996. (No model.)

To all whom it may concern:

Be it known that I, BENTON C. ROWELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Safety System for Railroads, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a plan illustrating diagrammatically my system as applied to four sections of track. Fig. 2 is an end and Fig. 3 a side elevation of the mechanism for controlling the safety apparatus for each of the four sections of track. Figs. 4 and 5 are sectional elevations corresponding to Figs. 2 and 3, but showing details not shown in Figs. 2 and 3. Figs. 6, 7, 8 and 9 illustrate the automatic lock by which the lock operated by the attendant is controlled.

My invention relates to guarding crossing sections of track and preventing a train from running onto such a section when it should not, and I have illustrated it as applied to four sections, making a double-track crossing.

My invention is an apparatus for blocking two or more sections of track, consisting essentially of a blocking apparatus for each section of track, a locking-bolt for each blocking apparatus, a locking-bar with a bolt-hole for each bolt, a hand-lever for moving each bolt and its blocking apparatus, and a hand-lever for moving the locking-bar to bring any bolt-hole over its bolt.

Another feature of my invention is the combination of an automatic electrical locking device locked by the presence of a train on any section and locking the locking-bar which controls the bolts of the blocking apparatuses.

The parallel tracks T T′ or T^2 T^3 may be regarded as a single section, for each section to be blocked consists of track T with relation to track T^2 or with relation to track T^3, and so of track T′ with relation to either T^2 or T^3, and so of track T^2 with relation to either T or T′, and so of T^3 with relation to either T or T′. On track T, I have indicated signal *a* and safety-stop *s*, both of which are controlled by lever A, so that when lever A is in its normal position, (shown in Fig. 2,) both *a* and *s* will be at "danger," (all this being too familiar to all skilled in the art to require illustration or description in detail,) the lever A, its connections, and the parts *a* and *s* constituting an apparatus such that track T is blocked when lever A is in one position, but is clear when lever A is in the other position. In like manner lever A′ and its connections and the parts *a′* and *s′* serve to block and clear track T′, and so of levers A^2 and A^3 and their connections with relation to tracks T^2 and T^3.

Each lever A A′ A^2 A^3 carries a bolt B B′ B^2 B^3, and these bolts are locked in place by the bar D when the lever A^4 by which bar D is shifted is in its normal position, (shown in Figs. 2 to 5,) for the holes *d* through bar D are then out of line with bolts B B′ B^2 B^3. Consequently none of the levers A′ A^2 A^3 can be moved to unblock either of the sections T T′ T^2 T^3 until lever A^4 has been moved to shift bar D and unlock the levers A and A′ if the lever A^4 be moved toward levers A and A′, or to unlock levers A^2 and A^3 if lever A^4 be moved toward A^2 and A^3. It will now be clear that lever A^4 and its bar D in connection with the bolts B B′ B^2 B^3 and the holes *d* in bar D constitute a locking device for the four apparatuses made up of the levers A A′ A^2 A^3 and their respective connections, and that this locking device can be shifted only when both conflicting sections (as T and T^2, T and T^3, T′ and T^2, or T′ and T^3) are blocked; also that when the locking device is shifted to allow any one of the four levers A A′ A^2 A^3 to be moved to clear its section, and that lever is so moved, then the bolt of that lever will lock bar D of the locking device and make it impossible to clear the conflicting sections or either of them.

For example: Suppose a train approaching on track T or T′. The operator in the tower will first move lever A^4 toward levers A A′, and thereby shift bar D and permit lever A or A′ to be moved. He will then move lever A if the train be about to pass over section T, (A′ if over section T′,) but in so doing he will shift *a* and *s* from "danger" to "clear" and will also cause bolt B to lock bar D, and thereby will lock the locking device A^4 D and prevent the conflicting sections T^2 T^3 from being unlocked, for the bar D is locked by the bolt B as soon as lever A is moved to clear section T, and when bar D is thus locked it is impossible to move either of the levers A^2 or A^3, and

therefore impossible to unblock or clear either of the conflicting sections T^2 or T^3.

While I have shown my blocking apparatus as applied to a grade-crossing, it is obvious that two parallel sections (as, say, T and T′) may be blocked each with relation to the other in the same way—as, for example, if it were desired to prevent a train passing over section T when a train is on section T′, or vice versa. The operator in the tower having unblocked section T (for example) by first moving lever A^4 toward levers A and A′, and next moving lever A to shift *a* and *s* from "danger" to "clear," awaits the passage of the train past *a* and *s* and then moves lever A back to its normal position, thereby shifting *a* and *s* from "clear" to "danger" and also unlocking bar D, whereupon he moves lever A^4 back to its normal position and is then ready for another train.

In many cases it is important to prevent the operator from unblocking one section too soon after he has unblocked a conflicting section, and to obviate all possibility of this I combine with lever A^4 a bolt E and a catch F, the catch F holding bolt E and preventing movement of lever A^4, except when the catch F is controlled by the magnet G, and as the coils of that magnet are in a circuit broken by either of the relays H H′ H^2 H^3 the magnet G is energized only when all these relays act to maintain the circuit through the coils of magnet G, but the circuit through each of the relays is maintained, except when a car is on any section between X and Y, when the wheels and axles short-circuit the relay of that section, causing its armature to drop and thereby break the circuit through magnet G, whose armature F then engages bolt E, which locks lever A^4, the result being that it is impossible for the operator to move lever A^4 so long as any part of a train occupies any section between X and Y; but as long as none of the sections T T′ T^2 T^3 are occupied by a car, current flows through the coils of each relay H H′ H^2 H^3, and each holds its armature in position to maintain a current through the coils of magnet G, which holds its armature F away from bolt E, so that the operator can move lever A^4 freely, except only when a car is on one or more of the sections between X and Y; but lever A^4 is locked automatically whenever any one or more of the sections between X and Y is occupied by a train or any part of a train.

What I claim as my invention is—

1. In a railway block system the combination of a plurality of blocking apparatuses; a locking-bolt for each blocking apparatus; a single locking-bar provided with a plurality of bolt-holes corresponding in number to the bolts; a hand-lever for moving each bolt and its blocking apparatus and a hand-lever for moving the locking-bar to bring any bolt-hole in line with its bolt, all substantially as described.

2. In a railway block system the combination of a plurality of blocking apparatuses; a locking-bolt for each blocking apparatus, a locking-bar with a bolt-hole for each bolt; a hand-lever for moving each bolt and its blocking apparatus; a hand-lever for moving the locking-bar to bring any bolt-hole in line with its bolt; a locking-bolt for that hand-lever; a magnet controlling that locking-bolt; and a system of circuits governed by the presence of a train on any of the blocked sections, whereby the locking-bar is locked electrically when a train is on any section to be blocked; all substantially as described.

BENTON C. ROWELL.

Witnesses:
J. E. MAYNADIER,
B. FRANK HATHAWAY.