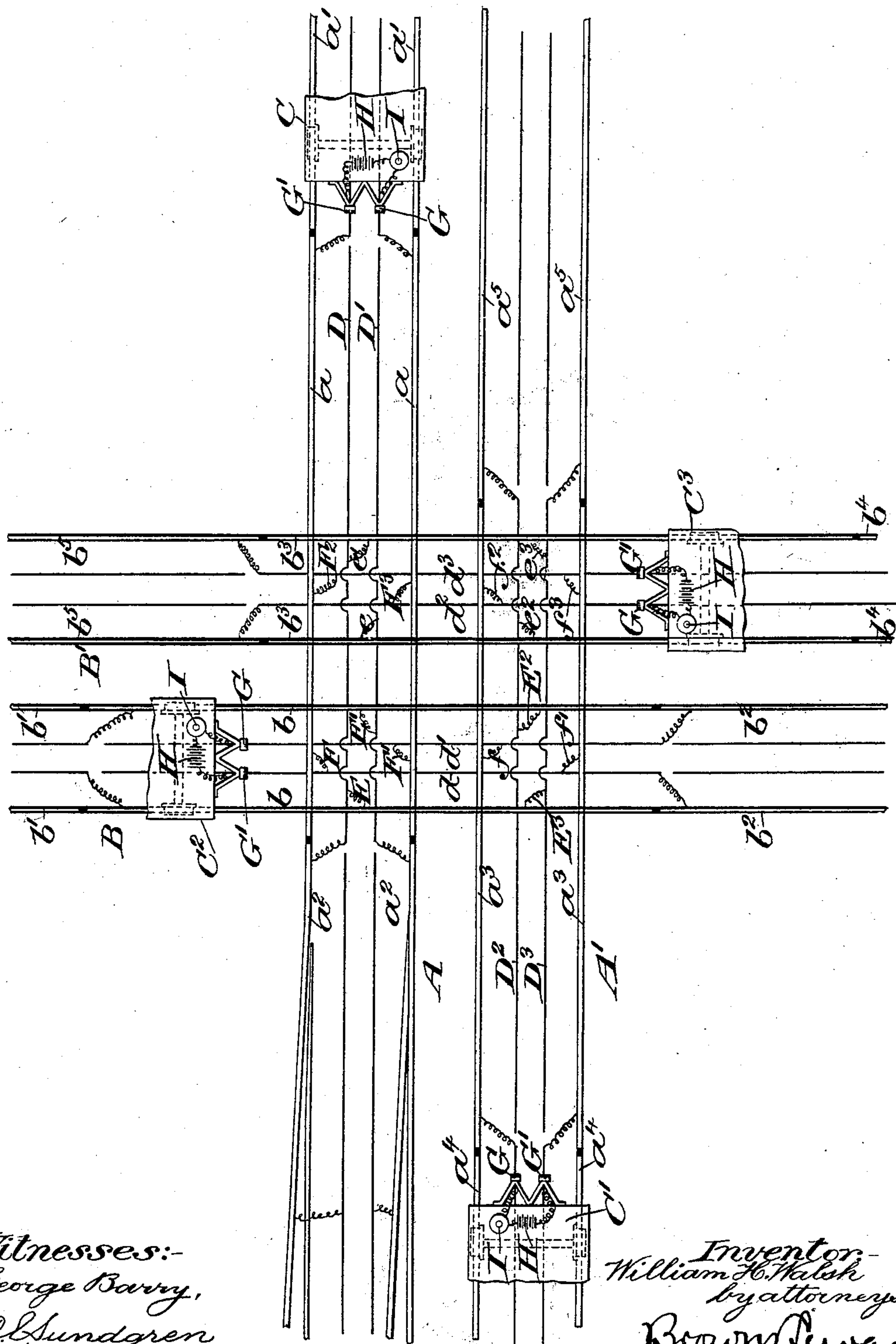


(No Model.)

W. H. WALSH.  
RAILWAY SIGNALING APPARATUS.

No. 534,414.

Patented Feb. 19, 1895.



Witnesses:-  
George Barry,  
O. Sundgren

Inventor:-  
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by attorneys  
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# UNITED STATES PATENT OFFICE.

WILLIAM H. WALSH, OF ALBANY, NEW YORK.

## RAILWAY SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 534,414, dated February 19, 1895.

Application filed September 26, 1894. Serial No. 524,156. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. WALSH, of Albany, in the county of Albany and State of New York, have invented a new and useful Improvement in Railway Signaling Apparatus, of which the following is a specification.

My invention relates to an improvement in railway signaling apparatus in which provision is made for giving notice to the engineers of two trains approaching a railway crossing, of the position of their respective trains in time to stop one of the trains while the other advances over the crossing.

A further object is to provide means whereby a train on the crossing circuit can signal to the engineer of the following train on the same track, so as to prevent a rear end collision, should the first mentioned train stop upon the crossing circuit.

The accompanying drawing represents a plan view of a double track railway crossing, the locomotives being represented conventionally in position approaching the crossing, one on each of the four tracks.

One set of double tracks is represented by A, A' and the other by B, B'. The locomotives on the tracks A, A', B, B' are denoted respectively by C, C', C<sup>2</sup> and C<sup>3</sup> and each is supposed to be traveling in a direction toward the track crossings. The rails of each track are divided into insulated sections as follows: The rails *a* of the track A are insulated upon opposite sides of the crossing from the rails *a'* at the right and from the rails *a<sup>2</sup>* at the left. The rails *a<sup>3</sup>* of the track A' are insulated from the rails *a<sup>4</sup>* on the left and from the rails *a<sup>5</sup>* on the right. In like manner the rails *b* of the track B are insulated upon opposite sides of the crossing from the rails *b'* on one side and from the rails *b<sup>2</sup>* on the opposite side of the crossing, and the rails *b<sup>3</sup>* of the track B' are insulated from the rails *b<sup>4</sup>* on one side and from the rails *b<sup>5</sup>* on the opposite side of the crossing. A pair of electric conductors extend along each insulated track section and have an electric connection with one of the adjacent track sections, but not with the track section along which they extend. For instance, the electric conductors D, D', extending along the track section *a, a'*, have electric connection with the rails *a<sup>2</sup>* on the track A, along which the train runs in

one direction, and the conductors D<sup>2</sup>, D<sup>3</sup>, extending along the section *a<sup>3</sup>, a<sup>3</sup>* of the track A' along which the train runs in the opposite direction, have electric connections with the rails *a<sup>5</sup>* at the right but not with the rails *a<sup>4</sup>* at the left. The conductors *d, d'*, extending along the insulated section *b, b* of the track B, have electric connections with the rails *b<sup>2</sup>* along which the train runs in one direction and the conductors *d<sup>2</sup>, d<sup>3</sup>* of the track B', extending along the section *b<sup>3</sup>, b<sup>3</sup>*, have connections with the rails *b<sup>5</sup>*, but not with the rails *b<sup>4</sup>*.

The conductors D, D' are further connected with the rails *b* of the tracks B, B' by electric conductors E, E' and with the rails *b<sup>3</sup>* of the track B' by electric conductors *e, e'*. The conductors D<sup>2</sup>, D<sup>3</sup> are connected with the rails *b* of the track B by conductors E<sup>2</sup>, E<sup>3</sup>, and with the rails *b<sup>3</sup>* by conductors, *e<sup>2</sup> e<sup>3</sup>*.

The conductors *d, d'* of the track B are connected with the rails *a* by electric conductors F, F' and with the rails *a<sup>3</sup>* of the track A', by conductors *f, f'*, and the conductors *d<sup>2</sup>, d<sup>3</sup>* of the track B' are connected with the rails *a* by electric conductors F<sup>2</sup>, F<sup>3</sup> and with the rails *a<sup>3</sup>*, by *f<sup>2</sup>* and *f<sup>3</sup>*.

The locomotives are each provided with a pair of brushes, represented by G, G', which are in electric communication through a battery H, carried by the locomotive, and the bell I, or other well known or suitable signal, also carried by the locomotive.

In operation, suppose a train to be approaching the crossing on the track A and a train to be approaching the crossing on the track B. Whichever of these trains reaches the insulated section of the crossing first will immediately give notice to the other while it is yet on the insulated section next adjacent to the crossing to the effect that it is about to cross the tracks and that the train then the farthest from the crossing must stop and await the crossing of the more advanced train. This notice will be given through the following circuit and each engineer will be notified of the fact that the other has received the signal, by the sounding of his own. For instance, the locomotive C<sup>2</sup>, having advanced toward the crossing onto the rails *b, b*, the locomotive C, when coming onto the rails *a*, will connect—through its brushes G, G'—the conductors extending along the insulated sec-



tion  $a'$  and hence the rails  $a$ , which are electrically connected with said conductors. The rails  $a$  are connected, by electric conductors  $F, F'$ , with the conductors  $d, d'$ , extending  
5 along the insulated section  $b, b$ , which conductors are electrically connected by brushes  $G, G'$  of the locomotive  $C^2$  and, the circuit being now complete through the batteries and signal on each locomotive  $C$  and  $C^2$ , the information will be complete. In the same manner, the engineer of the locomotive  $C'$  will be notified at the same time of the approach of the locomotive  $C^2$  nearer to the crossing, so that the way will be clear for the locomotive  
15  $C^2$  and its train to pass on over the crossing, while the locomotives  $C, C'$  and their trains farther from the crossings await the clear track. In the same manner, if the locomotives  $C^2$  or  $C^3$  were on the insulated rail sections adjacent to the crossing when the locomotives, either the one or both,  $C, C'$  had approached the crossing onto the insulated sections at the crossings, they would receive in-

formation to that effect and they would be stopped to await the advance over the crossing 25 of the train or trains which, by their approach to the crossing, had gained the right of way.

What I claim is—

Electrical signaling apparatus, comprising 30 crossing insulated track sections, electric conductors extending along said insulated crossing track sections and connected with adjacent insulated track sections but not with the track sections along which they extend, electric 35 conductors between the electric conductors of one track section and the rails, of a crossing track section and circuit closers, including batteries and signals, carried by trains passing along the tracks, substantially as set 40 forth.

WILLIAM H. WALSH.

Witnesses:

WM. J. DEMPSEY,  
W. W. ORR.