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2 SHEETS—SHEET 1.

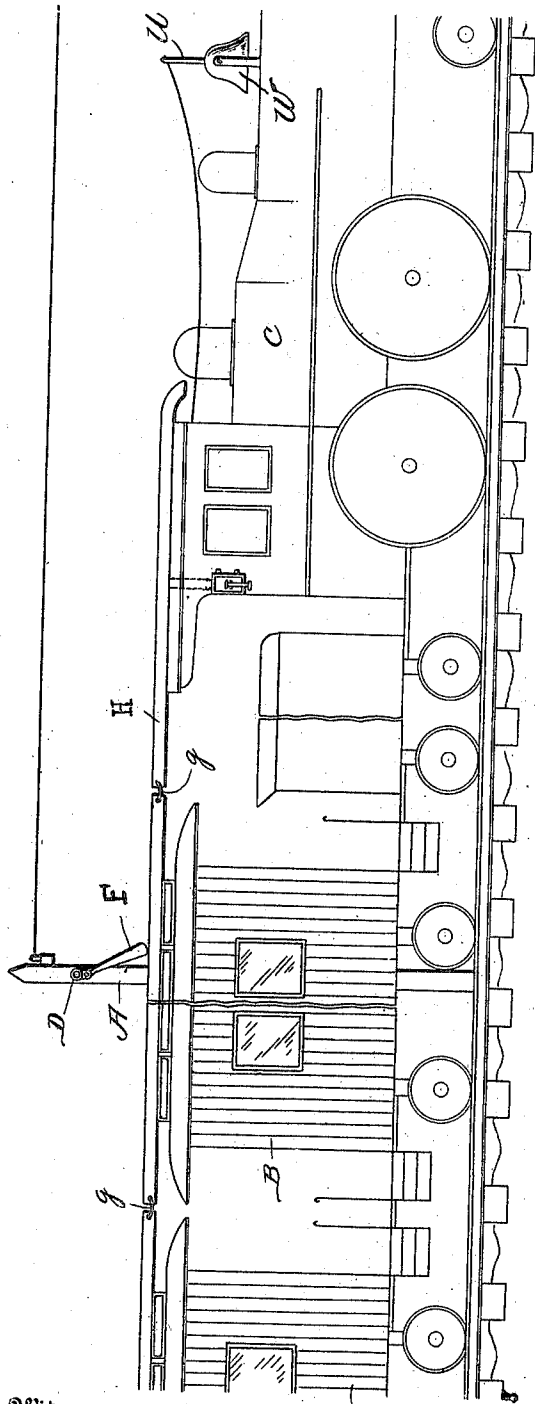


Fig. 1.

Witnesses

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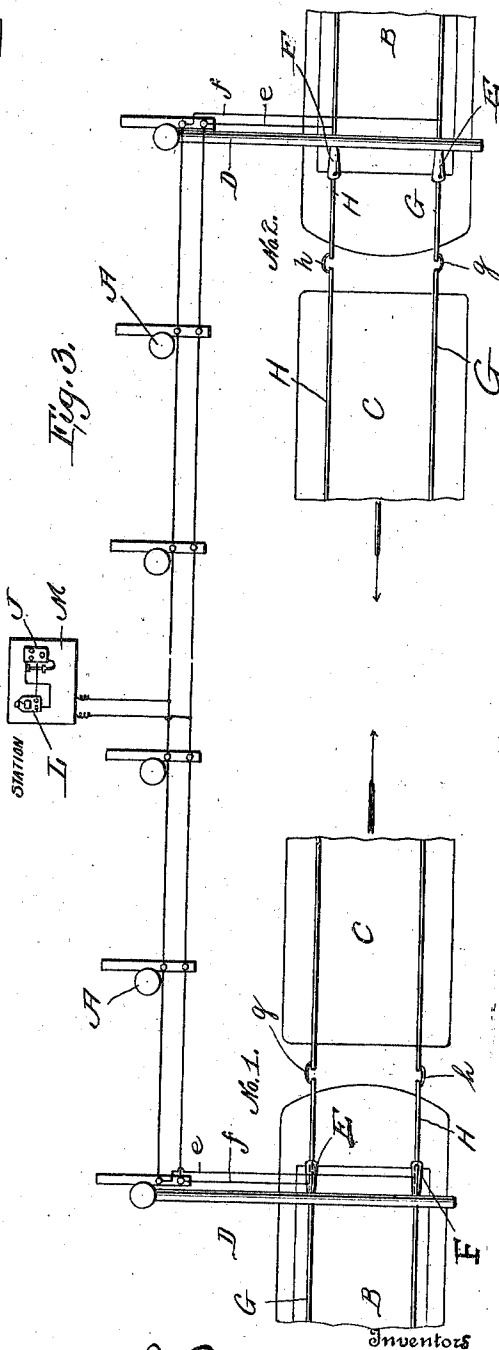


Fig. 3.

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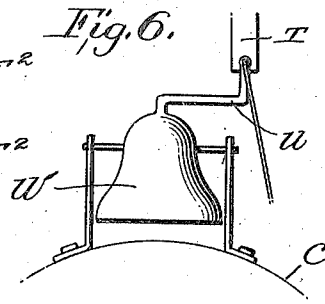
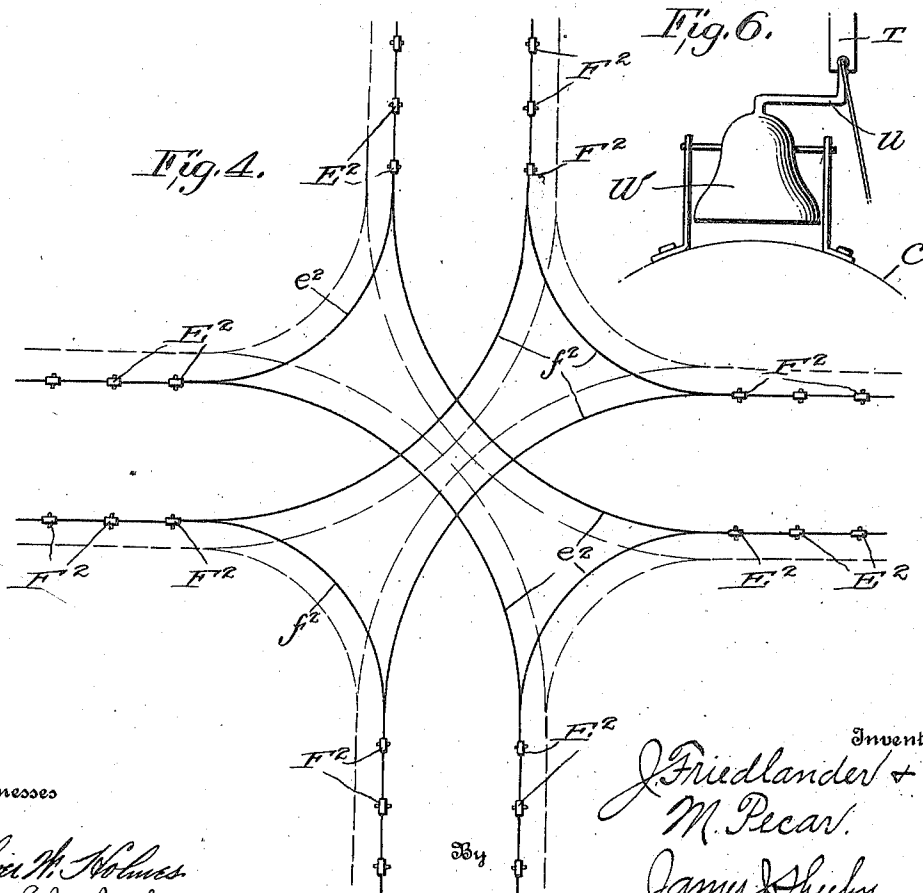
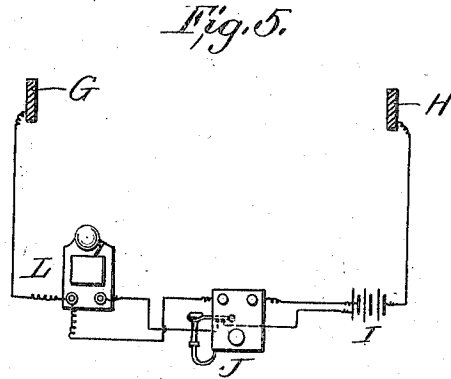
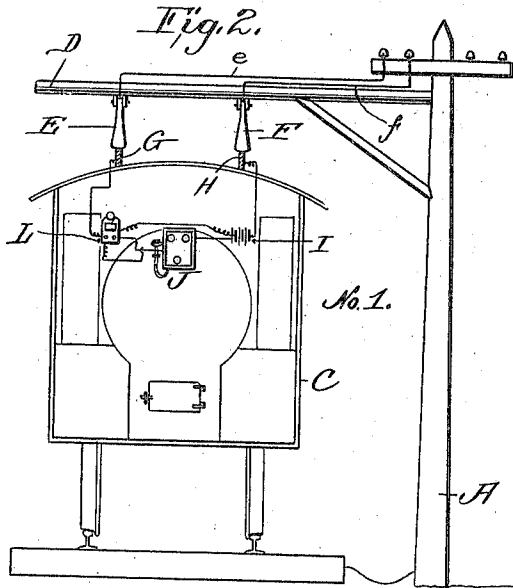
J. FRIEDLANDER & M. PECAR.  
AUTOMATIC ELECTRIC RAILWAY SIGNAL.

APPLICATION FILED JUNE 1, 1909.

951,640.

Patented Mar. 8, 1910.

2 SHEETS—SHEET 2.



Witnesses

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# UNITED STATES PATENT OFFICE.

JACOB FRIEDLANDER AND MIRKO PECAR, OF GARY, INDIANA.

AUTOMATIC ELECTRIC RAILWAY-SIGNAL.

951,640.

Specification of Letters Patent.

Patented Mar. 8, 1910.

Application filed June 1, 1909. Serial No. 499,397.

To all whom it may concern:

Be it known that we, JACOB FRIEDLANDER and MIRKO PECAR, citizens of the United States, residing at Gary, in the county of Lake and State of Indiana, have invented new and useful Improvements in Automatic Electric Railway-Signals, of which the following is a specification.

Our invention has relation to automatic, electric, railway signals; and its novelty and utility will be fully understood from the following description and claim when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:

Figure 1 is a view showing in side elevation a train and railway equipped with an apparatus constructed according to our invention. Fig. 2 is a vertical cross-section of the same. Fig. 3 is a broken plan view showing in diagrammatic fashion two trains equipped with our novel signal apparatus, and assumed to be moving toward each other on the same track. Fig. 4 is a diagrammatic view illustrating a railway crossing and a system of wiring, whereby an engineer approaching the crossing on one track will be put on notice in the event of a train approaching the crossing on the other track. Fig. 5 is an enlarged detail view showing diagrammatically the batteries and signals of the locomotive cab shown in Figs. 1 and 2, and at the left of Fig. 3. Fig. 6 is an enlarged view of the means for ringing the bell on the locomotive.

Similar letters and numerals of reference designate corresponding parts in all of the views of the drawings.

Generally speaking, the railway, the telegraph poles A at the side of the railway, and the cars B and locomotives C of the trains numbered "1" and "2", respectively, may be and preferably are of the ordinary, well known construction.

In carrying our invention into effect we provide at intervals in the length of the railway and at a suitable distance apart less than the length of ordinary trains arms D that overhang the railway and are, by preference, carried by certain of the poles A, Figs. 2 and 3. We also provide on the arms D swinging brushes E and F, and connect the several brushes E of the system by wires *e* and the several brushes F by wires *f*. Each of the trains No. 1 and No. 2 we equip with light longitudinal rails G and H posi-

tioned to contact with the brushes E and F incidental to the passage of the trains below the arms D; the rails G in each train being electrically connected together by interposed cables *g*, or other means, and the rails H in each train being similarly connected through cables *h* or other means. By virtue of the arms D being located at a distance apart less than the length of ordinary trains, as stated, the rails G and H of each train are obviously always in contact with at least one pair of brushes E and F. In an appropriate place on each train, and preferably in the locomotive cab thereof, we arrange an electrical equipment comprising, by preference, a source of electric energy I, a telephone set J and an electric bell L or other audible or visible signal, Fig. 5 each of which devices is *per se* of the ordinary, well known construction and need not, therefore, be particularly described. We also prefer to electrically connect the battery I, the telephone J and the electric bell L in each cab in the conventional manner; the connection to the bell L being through the telephone hook so that when the receiver is lifted from said hook and the hook moves upwardly in the usual manner, the bell L will be shunted out of the circuit.

By reference to Figs. 2 and 5, it will be observed that the plus pole of the battery I in train No. 1 is electrically connected with the right-hand rail H of said train, and the plus pole of the battery I in train No. 2 is electrically connected with the right-hand rail H of that train, this arrangement being resorted to in order to prevent sounding of the electric bells L when the trains are headed and moving in the same direction.

By virtue of the equipment described, and assuming that the trains No. 1 and No. 2 are headed toward each other on the same track, it will be observed that during the passage of the trains below arms D, the electric current will pass from the plus pole of the battery I in train No. 1, for instance, to the rail H of said train, and then through said rail H, the shoe F in contact therewith, the wire *f*, the other shoe F, the rail G of train No. 2, the bell L of said train, the battery I and rail H thereof, one shoe E, the wire *e*, the other shoe E, the rail G of train No. 1, the bell L of said train and back to the minus pole of the battery I thereof, with the result that the electric bells in the cabs of both trains will be set ringing, and the

engineer of each will be apprised of the approach of the other, and by proceeding cautiously will be enabled to avoid a head-on collision. It will also be manifest that when the engineers take down the receivers of the telephones, the electric bells L will be cut out, and the current then being through the telephones the engineers can conveniently communicate with each other regarding the subsequent conduct of their trains. It will further be observed by reference to Fig. 3 that when the wires *e* and *f* are connected with a telephone set J and an electric bell L in a suitably located station M, the engineers are enabled to communicate with and receive orders from a despatcher or other person in authority at the station. Communication between the trains is interrupted when the rails G and H of one passes out of contact with a pair of the brushes E F, but it will be manifest that when the rails G H of one train only are in contact with brushes E F, that train is in telephonic or telegraphic communication with the despatcher's station M.

In the crossing arrangement shown in Fig. 4, brushes E<sup>2</sup> F<sup>2</sup> are arranged at all four sides of the crossing and at a suitable distance therefrom, and the brushes E<sup>2</sup> F<sup>2</sup> of each track portion are connected through wires *e*<sup>2</sup> *f*<sup>2</sup> with track portions extending at right angles to the first named track portion. It will also be understood that the brushes E<sup>2</sup> F<sup>2</sup> are isolated from the wires *e* and *f*, and consequently when a train is traveling toward the crossing and is adjacent the crossing with the train rails G and H in contact with the brushes E<sup>2</sup> F<sup>2</sup>, the signal in the locomotive cab will be actuated in the event of a train approaching on the crossing track but not otherwise. It will thus be seen that when trains are moving on the crossing tracks and toward the crossing with their rails in contact with the brushes E<sup>2</sup> and F<sup>2</sup>, the engineers of the two trains will be put on notice each in regard to the adjacency of the other, and consequently by proceeding cautiously a collision at the crossing can be readily avoided.

While we have described telephone sets J as the preferred means for enabling the engineers and despatcher to communicate with or signal each other, we do not desire to be understood as confining ourselves to said means, inasmuch as other signaling or communicating means may be employed without involving departure from the spirit of our invention.

In order to apprise the engineer of either train of the fact that his train is in electrical connection with two of the brushes E and F, or with two of the brushes E<sup>2</sup> F<sup>2</sup> complementary to the crossing, we prefer to provide each overhanging arm D with a tappet T which, by engaging an upstanding crank U on the usual bell W of the locomotive, is adapted to ring said bell as the locomotive passes. Said tappet T and the co-operating appurtenances on the locomotive bell W are, however, not essential to the successful practice of our invention and may, therefore, be omitted without affecting the invention. We would also have it understood that when deemed expedient, the tappets U may be used only on the arms D bearing the brushes E<sup>2</sup> F<sup>2</sup> complementary to the crossing arrangement.

It will be readily gathered from the foregoing that our novel signal apparatus is simple and inexpensive in construction, is well adapted to withstand the usage and exposure to which railway signals are ordinarily subjected, and is capable of being readily applied to railways and rolling stock at present in use.

Having described our invention, what we claim and desire to secure by Letters-Patent, is:

In an electric railway signal, the combination of crossed railways, suitably supported pairs of brushes spaced apart one pair at each of the four sides of the crossing, wires connecting the brushes of the pairs of each railway with the respective brushes of the pairs of the other railway, a railway train, longitudinal rails carried by and extending throughout the length of the train and adapted to directly contact with the brushes incidental to the passage of the train, and a signal a normally-open signal circuit and a source of electric energy, carried by the train, said circuit including said signal and said source of energy and having connections with said rails whereby a signal is produced on the train when either of the pairs of brushes on the opposite railway are electrically connected and the rails of the train are in contact with the pair of brushes.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JACOB FRIEDLANDER.  
MIRKO PECAR.

Witnesses:

JNO. J. HANLEY,  
F. L. TALCOTT.