No. 697,654. Patented Apr. 15, 1902.

A. NOVÁK.

TRAIN SIGNAL.

(Application filed Nov. 30, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

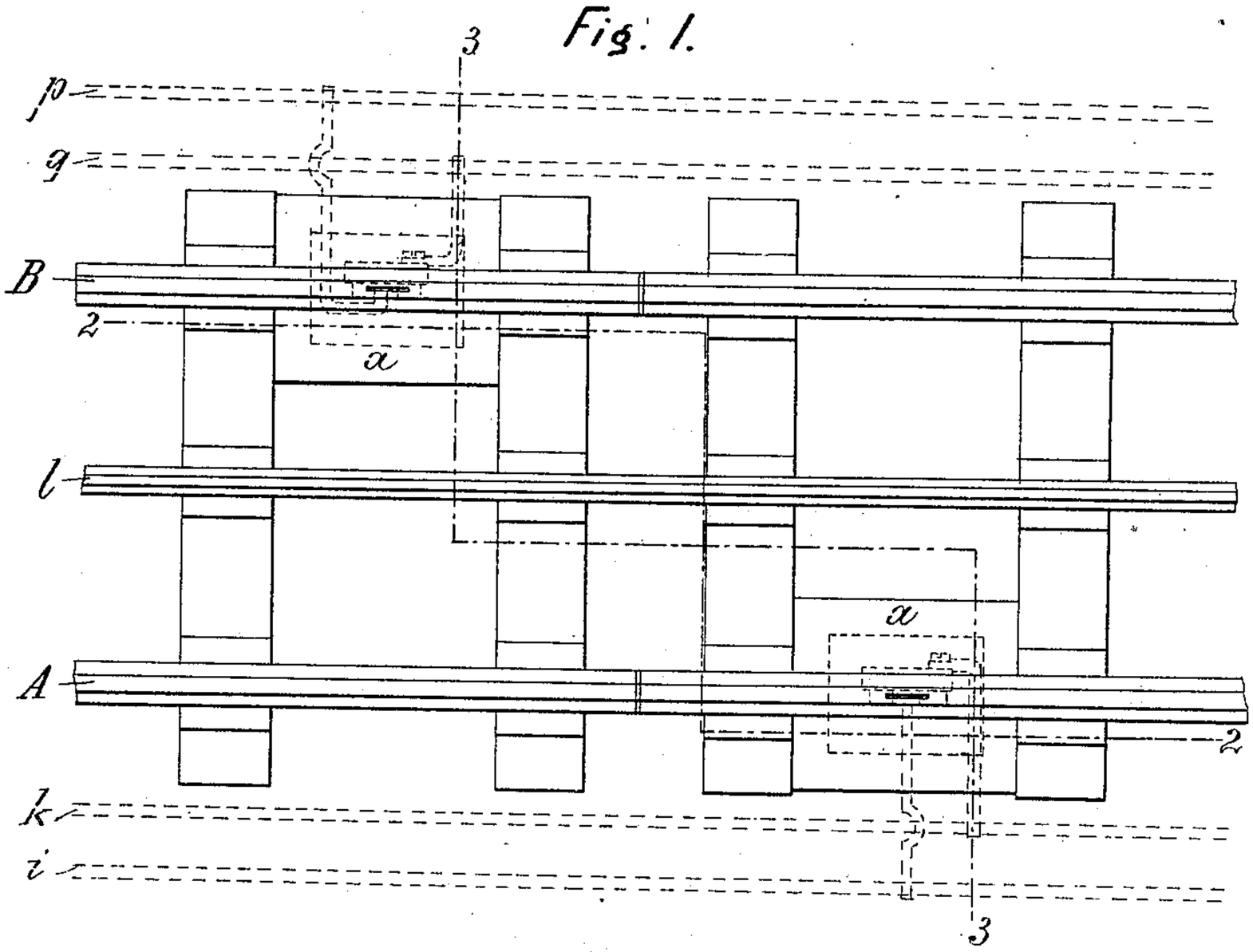


Fig. 2.

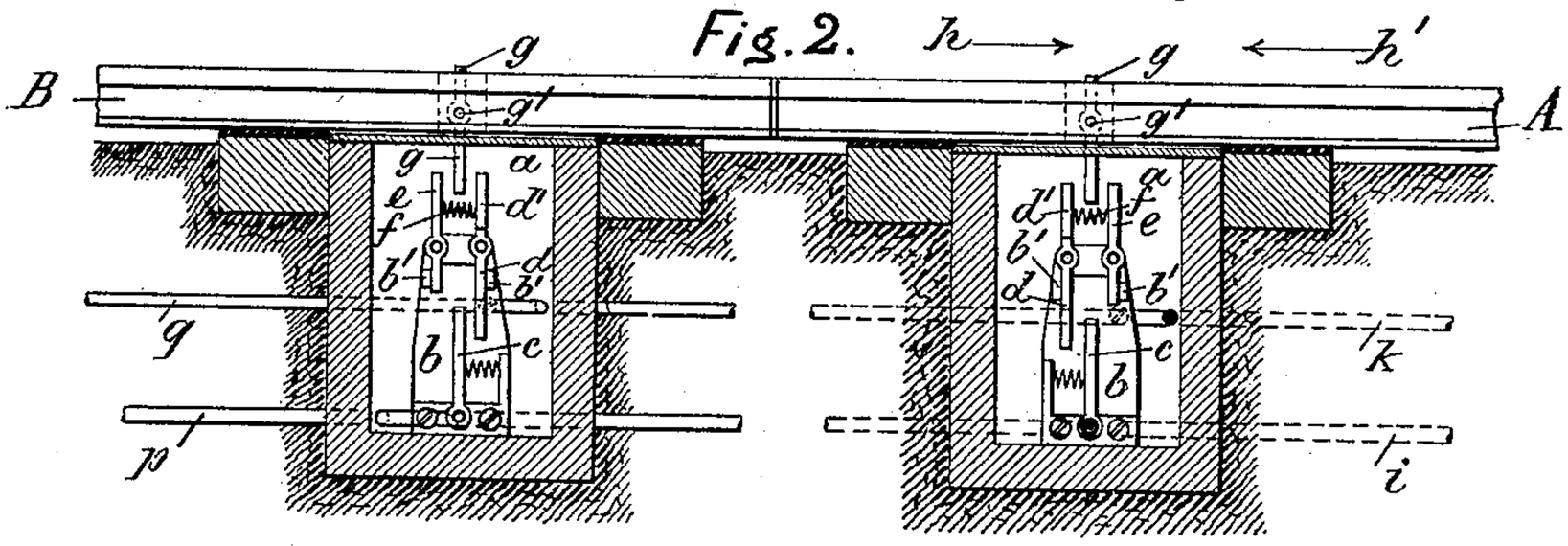
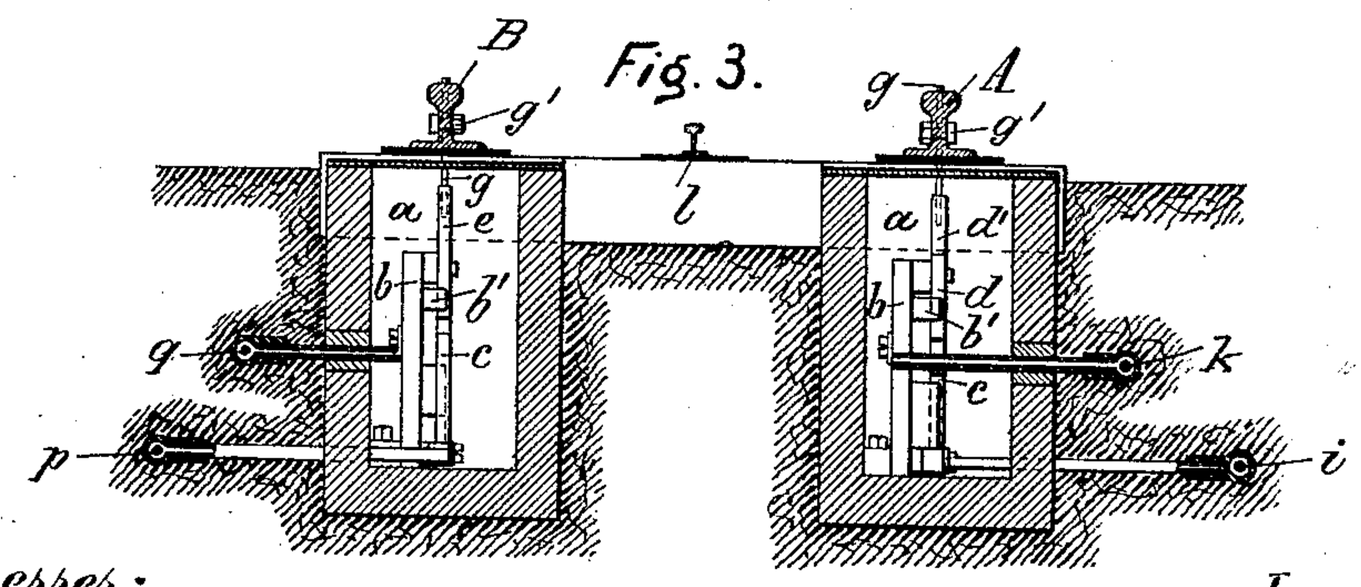


Fig. 3.



Witnesses:
Arthur Trumpe.
Edward Ray.

Inventor:
Andreás Novák
by his attorneys
Roeder & Briesen

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Fig: 4.

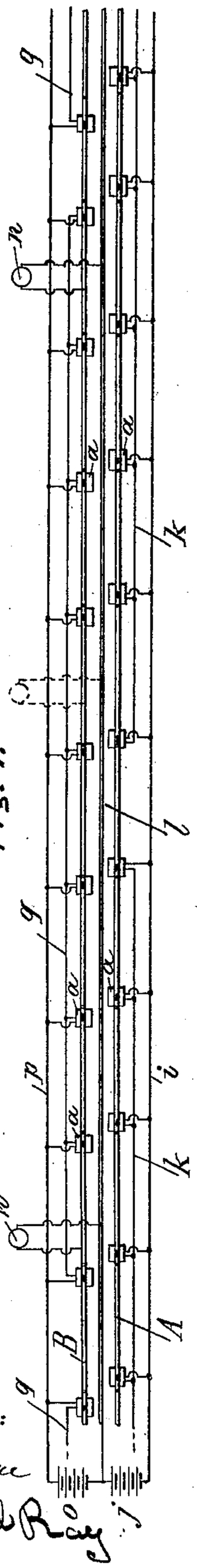


Fig: 5.

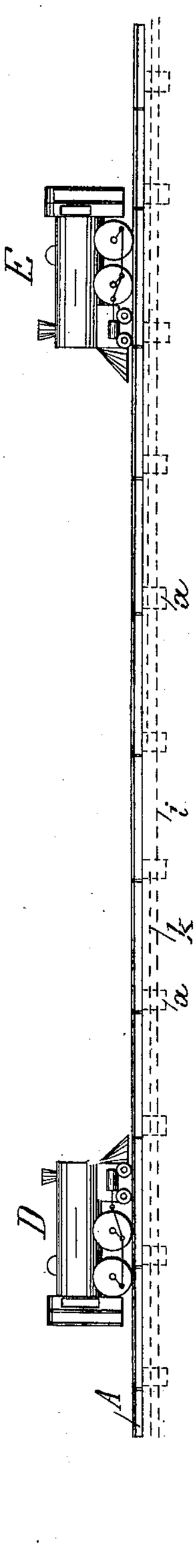
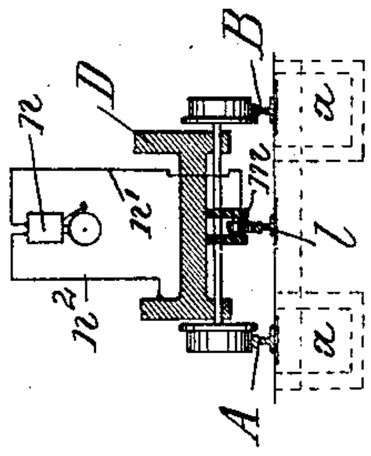


Fig: 6.



Witnesses:
Arthur Lunyce
Edward Ray

Inventor:
Andreas Novák
by his attorneys
Roeder & Briesen

UNITED STATES PATENT OFFICE.

ANDREÁS NOVÁK, OF TRENTON, NEW JERSEY, ASSIGNOR OF ONE-HALF TO SIGMUND ZEISLER, OF TRENTON, NEW JERSEY.

TRAIN-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 697,654, dated April 15, 1902.

Application filed November 30, 1901. Serial No. 84,195. (No model.)

To all whom it may concern:

Be it known that I, ANDREÁS NOVÁK, a citizen of Austria-Hungary, and a resident of Trenton, Mercer county, State of New Jersey, have invented certain new and useful Improvements in Train-Signals, of which the following is a specification.

This invention relates to an improved electric signaling mechanism by means of which trains approaching each other from opposite directions on a single track will exchange alarms, so that the engines may be stopped before a collision occurs.

In the accompanying drawings, Figure 1 is a plan of my improved train-signal; Fig. 2, a vertical longitudinal section on line 2 2, Fig. 1; Fig. 3, a vertical cross-section on line 3 3, Fig. 1; Fig. 4, a diagram illustrating the circuit; Fig. 5, a side view of the track, showing the arrangement of signal-boxes; and Fig. 6, a diagram showing a locomotive-truck in cross-section provided with the alarm.

The two rails A and B of the single-track railway are arranged in blocks of, say, a thousand yards, each block being provided with an electric circuit and the blocks of one rail breaking line with those of the other rail. In this way an engine when near the end of the block on one rail will be at about the center of the block of the other rail, so that collisions at the termini of any one block are prevented. All the rails are insulated from each other and from the ground.

Below each rail are sunk into the road-bed a series of equidistant chambers *a*, the distance between each pair of adjoining chambers corresponding, substantially, to the normal length of a train. Within each chamber is fitted a metal frame *b*, carrying a lower spring-influenced insulated contact *c*. Above the contact *c* and at opposite sides thereof there are pivoted to frame *b* a receiving contact-lever *d* and a transmitting contact-lever *e*, both in metallic contact with the frame. The lever *d* has an insulated upper section *d'* and is of such a length that when tilted its lower end will touch the upper end of contact *c*. The lever *e* is shorter than lever *d* and is metallic from end to end. The levers *d e* are held in their normal position by a spring *f* and a pair of stops *b'*.

Between the upper ends of the levers *d e* projects the lower end of a lever *g*, pivoted to the track-rail A at *g'* and extending with its upper end through a slot above the tread of the rail. The lever *g* is adapted to be tilted by the wheels of the train, so as to make contact with either the lever *d* or the lever *e*, according to the direction of travel. A train approaching in the direction of the arrow *h* (right-hand side, Fig. 2) will tilt the lever *g*, so as to in turn tilt lever *d* and close the contact between the parts *d* and *c*. A train approaching in the direction of the arrow *h'* (right-hand side, Fig. 2) will tilt the lever *g* so as to close the contacts between the parts *g* and *e*. Thus when two trains approach each other from opposite directions upon the same track the train of locomotive D will close the transmitting-contact *g d c* of one box *a*, while the locomotive E of the other train will close the receiving-contact *g e* of another box *a* on the same block. All the contacts *c* of rail A receive their current from a cable *i*, connected to a battery or source of electricity *j*. The frames *b* of each block are connected with each other by means of a cable *k*. A return-wire or third rail *l* extends along the track and goes back to battery *j*.

The engines D and E are provided with an insulated trolley-wheel or sliding contact *m*, engaging rail *l*. The engines also carry an alarm *n*, which by wire *n'* is connected to contact *m* and by wire n^2 is connected to the metallic frame of the engine.

The levers *d* and *e* of rail A are placed in an opposite direction from those of the rail B, Fig. 2. The battery and cables of rail A are duplicated for rail B, while the third rail *l* is used in common. *o* corresponds to battery *j*. *p* corresponds to cable *i*, and *q* corresponds to cable *k*. Thus each engine operates a transmitting-contact with one side and a receiving-contact with the other side, so as to give as well as to receive signals.

The operation is as follows: When the two approaching trains tilt the levers *g* of rail A in opposite directions in the manner above specified, so as to close the contacts *d c* by engine D and contacts *g e* by engine E, the current travels as follows: From battery *j*, cable *i*, contact *c*, lever *d*, frame *b*, cable *k*,

frame *b* of another chamber, contact *e*, lever *g*, engine E, wire n^2, alarm *n*, wire *n'*, trolley-wheel *m*, third rail *l*, back to battery *j*. In this way the engine D gives an alarm to the engine E. The levers *d* and *e* being arranged in a reverse manner for rail B, the engine E will here close the transmitting-contacts *d c*, while the engine D will close the receiving-contacts *g e*. The current travels as follows: From battery *o*, cable *p*, contact *c*, lever *d*, frame *b*, cable *q*, frame *b* of another chamber, contact *e*, lever *g*, engine D, wire n^2, alarm *n*, wire *n'*, trolley-wheel *m*, third rail *l*, back to battery *o*. In this way the engine E gives an alarm to engine D, and both engines are therefore forewarned. As soon as the wheels of a train have passed over a lever *g* such lever will swing back into its normal position by gravity, ready for the next wheel.

What I claim is—

1. A train-signal composed of a series of metallically-connected metal frames arranged along the rails, transmitting and receiving contacts mounted upon said frames, means for connecting the transmitting-contacts with a source of electricity, means for closing the transmitting and receiving contacts by each of two moving engines, alarms on the engines adapted to be brought into metallic connection with the receiving-contacts, and a return-wire, substantially as specified.

2. A train-signal composed of a series of levers *g*, projecting above the rails, a series of contacts *c*, a transmitting-contact *d*, having an insulated section, and a receiving-contact *e*, the levers *g*, being adapted to engage the contacts *d*, *e*, and the contact *d*, being adapted to engage the contact *c*, substantially as specified.

3. A train-signal composed of rails arranged in blocks, a series of chambers, frames within the chambers, contacts *c*, *d*, and *e*, pivoted to the frames, levers *g*, for engaging the contacts *d*, *e*, cables connecting the contacts *c*, cables connecting the frames *b*, and a return-wire *l*, substantially as specified.

4. A train-signal composed of rails arranged in blocks, a series of chambers, frames within the chambers, contacts *c*, *d*, and *e*, pivoted to the frames, levers *g*, for engaging the contacts *d*, *e*, cables connecting the contacts *c*, cables connecting the frames *b*, and a return-wire *l*, combined with an engine having a trolley-wheel, and an alarm which is in metallic contact with said wheel and with the engine-frame, substantially as specified.

Signed by me at Trenton, New Jersey, this 27th day of November, 1901.

ANDREÁS NOVÁK.

Witnesses:
JOHN ELIAS,
ALEX. ROSENBERG.