

(No Model.)

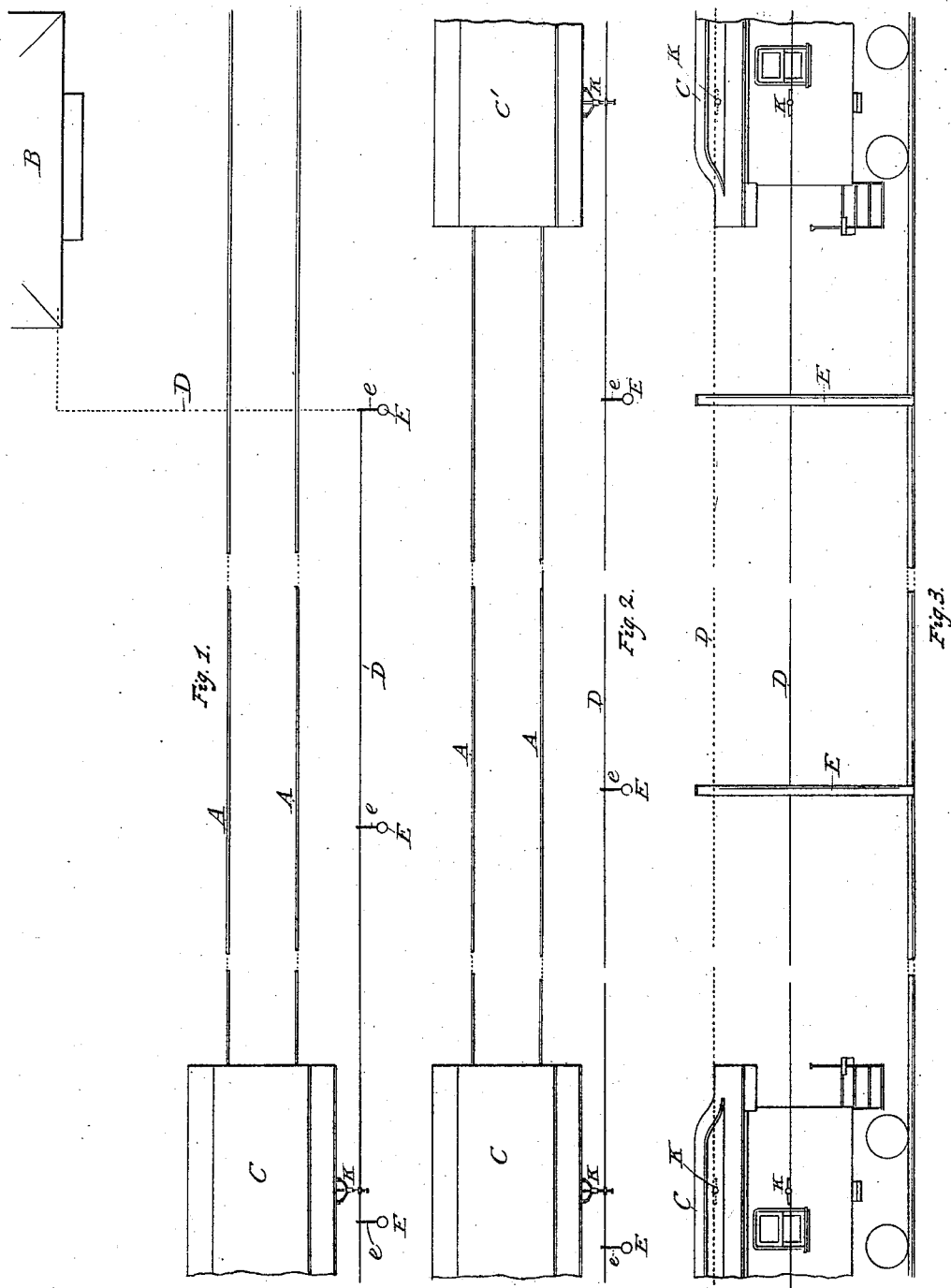
3 Sheets—Sheet 1.

A. FRYER.

MEANS FOR MULTIPLEX TELEGRAPHING BETWEEN CARS OF RAILWAYS.

No. 528,902.

Patented Nov. 6, 1894.



Witnesses.
Charles Swain
A. L. Kirk

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(No Model.)

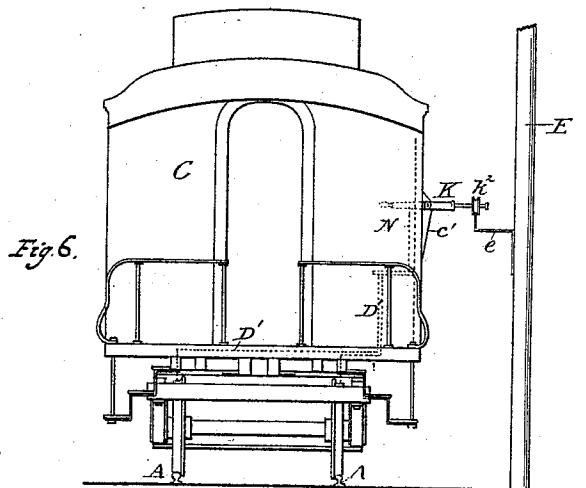
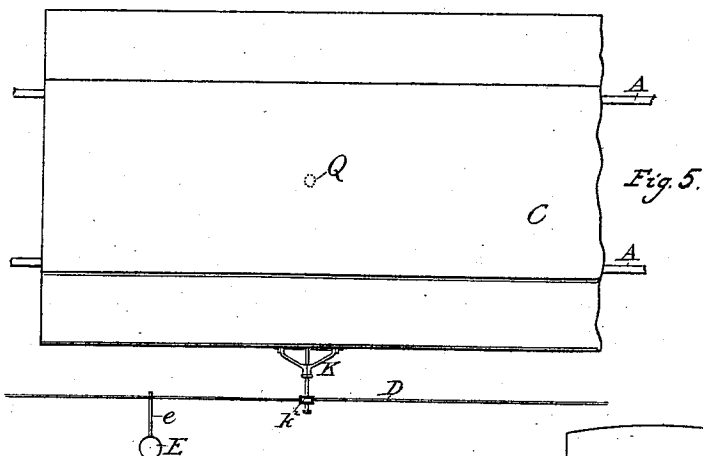
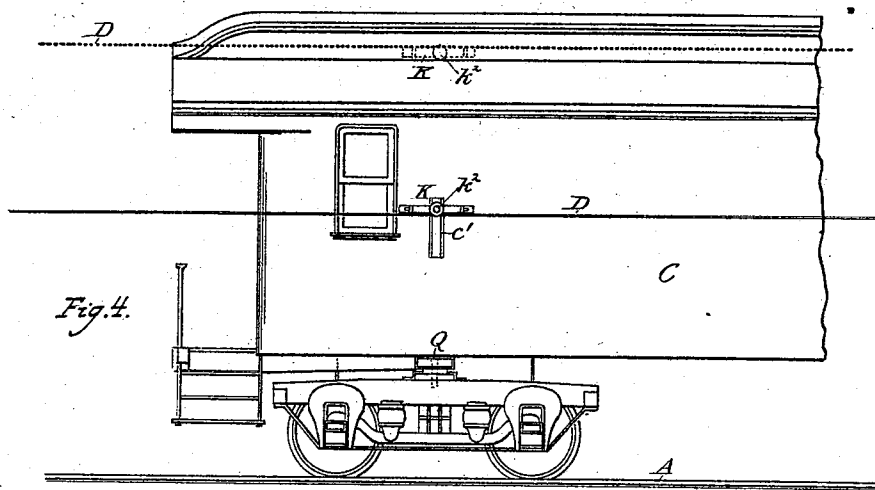
3 Sheets—Sheet 2.

A. FRYER.

MEANS FOR MULTIPLEX TELEGRAPHING BETWEEN CARS OF RAILWAYS.

No. 528,902.

Patented Nov. 6, 1894.



Witnesses.

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(No Model.)

3 Sheets—Sheet 3.

A. FRYER.

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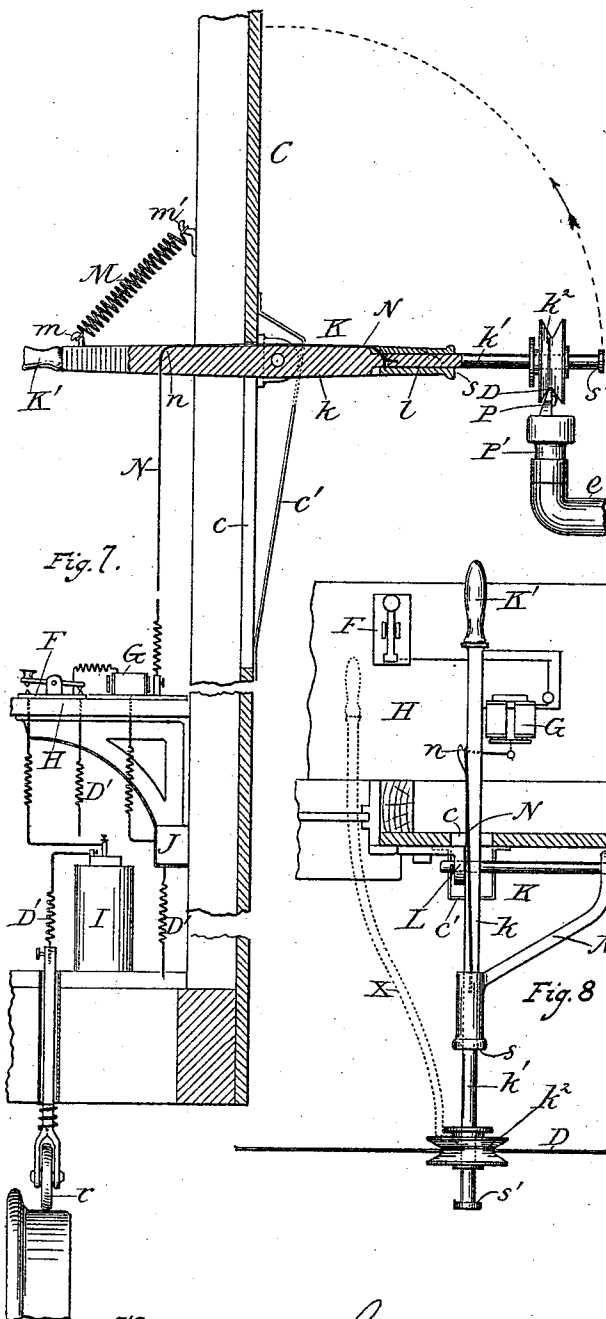


Fig. 7.

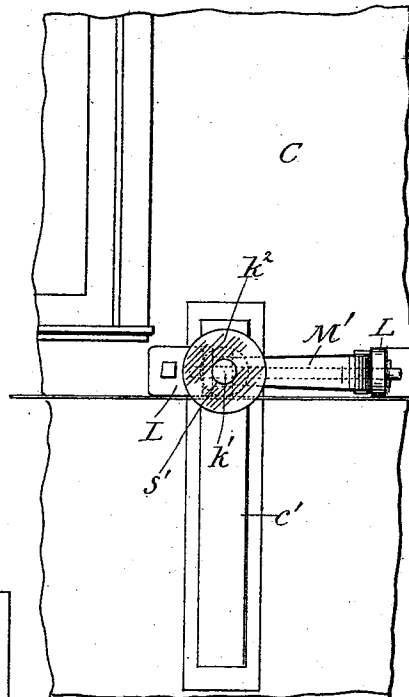


Fig. 9.

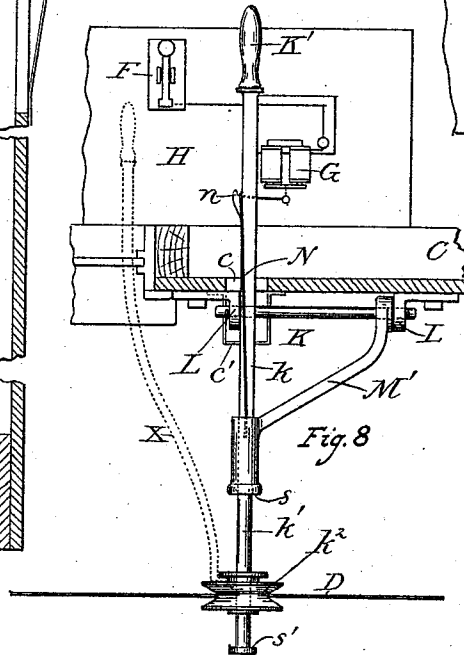


Fig. 8.

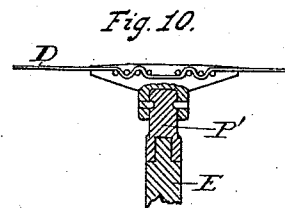


Fig. 10.

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UNITED STATES PATENT OFFICE.

AARON FRYER, OF BATH-ON-THE-HUDSON, NEW YORK, ASSIGNOR OF ONE-HALF TO DAVID WIGGINS, OF SAME PLACE.

MEANS FOR MULTIPLEX TELEGRAPHING BETWEEN CARS OF RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 528,902, dated November 6, 1894.

Application filed March 17, 1892. Serial No. 425,248. (No model.)

To all whom it may concern:

Be it known that I, AARON FRYER, a citizen of the United States, residing at Bath-on-the-Hudson, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Means for Multiplex Telegraphing Between Cars of Railways; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in means for electrical communications between railway trains on the same track, or between a railway train and stations; and it consists in the combinations of devices and elements hereinafter particularly described and specifically set forth in the claims.

The objects of my invention are, first, to provide means by which the conductor or other trainman may from his train, whether running or standing on the track, communicate with another train on the same track, or with one or both stations the train may be between, and, second, to provide particular combinations of devices and elements by the use of which my invention may be carried into effect. I attain these objects by means illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view illustrating a railway track, a station and a car of a train on the track, and means for electrical communication between the train and the station. Fig. 2, is a plan view of a railway track, cars of two trains on the same track and means for electrical communication between the two trains. Fig. 3, is an elevation illustrating the track, cars of two trains on the same track and means for electrical communication between said two trains. Fig. 4 is a side elevation of a railway car provided with means for connecting a telegraphic instrument with a line wire having communication with a station or car of another train. Fig. 5, is a plan view of a car of a train, track, line wire and means for connecting the instruments of the car with the said line wire. Fig. 6, is a transverse view showing a car of a train, line wire and means for connecting the instruments of the train with the line wire. Fig. 7, is a sec-

tional view of a car of a train, line-wire instruments in the car, trolley and wire between the line-wire and instruments, and wires for grounding the electrical currents. Fig. 8, is a plan view of the line-wire, trolley, car, (section of same) and instruments. Fig. 9, is a face view of the trolley when in position, from the car, for communicating from the line-wire to the instruments. Fig. 10 is a view of a line wire bridge.

The same letters of reference refer to similar parts throughout the several views.

In the drawings A A represent the rails of a railway track.

B is a station.

C is a car of a train on the said track.

D is a line-wire through which the car C may have communications with the car C', of another train, or station B, or with a distant signal, neighboring the said track. This line-wire D is preferably supported above the plane of the track and relatively at a side of the same and within a short distance from a side of cars C C', when standing on the track, from brackets *e* secured to suitable poles or standards E.

The drawings show only one car C of the number comprising the same train, and one car C' of a number comprising a second train, running on the same track. These cars C and C' are sufficient for use to illustrate my invention and those parts or devices with which cars, either passenger, express, mail, baggage, freight or caboose, or the cab of a locomotive may be provided with, for carrying my invention into practice.

The car, or cars C, C' of trains which are to have communication with cars of another train on the same track, or with a station house or a station signal, are each provided with instruments for simultaneous transmission of signals or communications, as may be required, as in the use of duplex or quadruplex systems, with the transmitter, receiver, resistant-boxes, batteries, and other adjuncts suitably connected by wires for producing necessary circuits and grounding the same, and also a trolley for making and breaking at will communication between the respective instruments in the car and the line wire D at the side of the track.

In Figs. 7 and 8 the transmitter F, and re-

ceiver or sounder G are shown to be supported on a table H within the car, with battery I and resistant box J also suitably supported within the car. These instruments and devices are suitably connected by wires and switches for breaking and closing two or more electrical circuits in succession and changing the strength and polarity of currents as may be required in the practice of duplex and quadruplex or multiplex telegraphs, which is so well known to those familiar with the art, that no particular description of the several devices, circuits and their adjuncts are necessary in this specification, and further because none of the combinations of devices and elements for the practice of multiplex telegraphing as practiced form any part of my invention. As any of the known instruments and systems of connections of devices and elements used with the same and their batteries and adjuncts may be employed, for multiplex telegraphing, I do not confine myself to the use of any particular kinds or classes of instruments or their adjuncts for the practice of my invention.

The respective wires D' D' D', for grounding the currents, are preferably carried each to a wheel of the car truck through a suitable roller *r* as is illustrated in Fig. 7; or the grounding of the wires may be effected by placing them in direct contact with the said wheels or their axles or with the rails as illustrated in Fig. 6.

K is a trolley composed of arm *k* provided with brackets L secured to a side of the car or cab, spindle *k'*, made of a good conducting metal and secured to the outer end of arm *k* with a non-conducting substance or packing *l* between as illustrated in Fig. 7, and the trolley wheel *k*² loosely mounted on said spindle *k'* and free to be moved in either direction between the shoulders *s* and *s'*. This trolley is rendered elastic by means of a tension spring between it and the car, or an adjunct of the latter, and preferably by means of spring M, connected by hook *m*, secured to the inner end portion of the trolley arm *k* and hook *m'* secured to a piece of the car. This trolley arm is shown to be braced by suitable bracing pieces M', and has its inner end provided with a suitable handle K' for convenience of placing the trolley to carry the trolley wheel toward or from the line wire D. A wire N suitably connected with spindle *k'* of the trolley, for electrical connection with the same, and also suitably insulated, runs from the said spindle *k'* over a wire support *n* and is suitably connected with the electro magnet or adjunct of the receiver or sounder G. Although this trolley may be carried to and from the wire D from below yet in some cases it may be advantageous to have the trolley wheel applied to the line wire D from its upper side as the gravity of the said arm and tension of the spring M supplement each other to force the trolley wheel to a holding with the said line wire, so that

there may be no liability of the said wheel being thrown out of contact with the said wire by the side swaying or vertical movements of the car. When the line wire D is supported high up as indicated by dotted lines in Figs. 3 and 4, the trolley wheel *k'* may be applied to the same from its lower side as indicated by dotted lines in the same figures.

The brackets *e* extending from the poles E support metallic bridges P, Figs. 7 and 10, which bridges are suitably secured through insulators P' with the said brackets, and the line wire D is suitably secured to these bridges either by soldering or by hitches or bends of the wires about suitable posts made with said bridges as illustrated in Fig. 10. The trolley K may be connected with the side of the car at any point, yet preference is given to its connection with the car at a point on a line opposite to a vertical line of the axis of the king bolt Q, which is central in the truck and holds it with the car as illustrated in Figs. 4 and 5.

When the arm *k* of the trolley runs through the side of the car as shown in Fig. 7, a suitable opening *c* may be made through the said side, which opening may be covered by a suitable sheath or covering piece *c'*, Figs. 7 and 9.

The manner in which the parts of this invention operate is as follows: One or more cars of each train, or the cab of a locomotive of the same, running on the same track are to be equipped with suitable instruments,—transmitters and receivers or sounders,—and their adjuncts such as batteries, resistant boxes, switches, wires, &c., necessary for the practice of multiplex telegraphing through a line wire D, and they are also to be provided with suitable trolleys, under control of operators, by which electrical circuits may be broken or closed, at will, between the said line wire D and the said instruments. When the trolley of a car C, of say train 1, is so placed that its trolley wheel *k'* is in contact with the line wire D, electrical circuits will be established so that a message or signal may be sent out from the said train as from car C to the receiving instrument or sounder in car C' of another train, say train 2, on the same track, when the trolley of such car C' of train 2 has also its trolley wheel in contact with the same line wire D. At the same time a message or signal may be sent through the same line wire from car C' of the said train 2, to be received by the receiving instrument in car C of train 1; and whether the cars C and C' of the said two trains are standing on the track; or those of one train, are standing and those of the other are running, or those of both trains are in motion, telegraphic messages or signals may be sent from one train to the other, or be exchanged simultaneously as circumstances or the rules of the railroad may require to be done.

In case of loss of time in running, of a train on a block between stations, or an accident to

a train, such a train while running may at will send a message or signal signifying the cause of delay to the station last passed, or the station the train is approaching, or to an approaching train, or to an electrical way signal as may be required by the rules of the road, and may also receive and answer messages or signals from the station last passed or from the one the train is approaching, or from a train approaching either station, when such trains are provided with cars having the transmitting and receiving instruments and trolleys, and the other described adjuncts for producing, breaking and closing electrical circuits for multiplex telegraphing through the line wire D as described.

The trolley K, being at a side of the car and at a point on a line opposite a line drawn through the vertical axis of the king bolt Q, will at all times, whether the train is running on a straight or curved track, have its point of pivotal connection with the car at a like distance from the line wire D when the latter is run relatively parallel with the rails of the track, while the length of the trolley wheel spindle k' will allow a length of horizontal movement of the trolley wheel to compensate for the sway of the car.

It is to be understood that the telegraph instruments and their adjuncts, together with the trolley may be provided in the cab of the locomotive, if preferred, for the practice of my invention.

The trolley wheel k^2 may be moved in either direction, horizontally, on the trolley wheel spindle k' for placing the said wheel in contact with the line wire D by means of a suitable instrument. The drawings Fig. 8, illustrate by dotted lines a trolley wheel placer X which may be employed, the hook end, at the wheel k^2 being inserted in an annular groove made with the hub of the wheel while its handle end is held by an operator in the car

through a window or other suitable opening through the side of the car. When the trolley wheel is placed in contact with the wire this instrument may be readily detached from the same.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a line wire supported parallel with the track of a railway and relatively at a side of the same, and a car, of the pivoted trolley arm k , horizontal spindle k' trolley wheel k^2 loosely mounted on said spindle, tension spring M between said trolley arm and the car, and a wire N, for connection at will of the said spindle with an apparatus operated by electrical currents, substantially as and for the purposes set forth.

2. The combination with a line wire which is supported parallel with a track of a railway and relatively at a side of the same, two cars distant from each other and on the same track, and having, each, a trolley arm under control of an operator and pivoted to it, a horizontal spindle carried by the said arm, a trolley wheel loosely mounted on said spindle for contact with said line wire, a tension spring between said trolley arm and car for holding the trolley wheel in contact with said line wire, while either or both of said cars are moving, a telegraphing or signaling apparatus, and the wire N, for connection of said spindle with said apparatus, whereby signals or telegraphic communications may at will be had between said cars, substantially as and for the purposes set forth.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

AARON FRYER.

Witnesses:

CHARLES SELKIRK,
A. SELKIRK, Jr.