

No. 859,950.

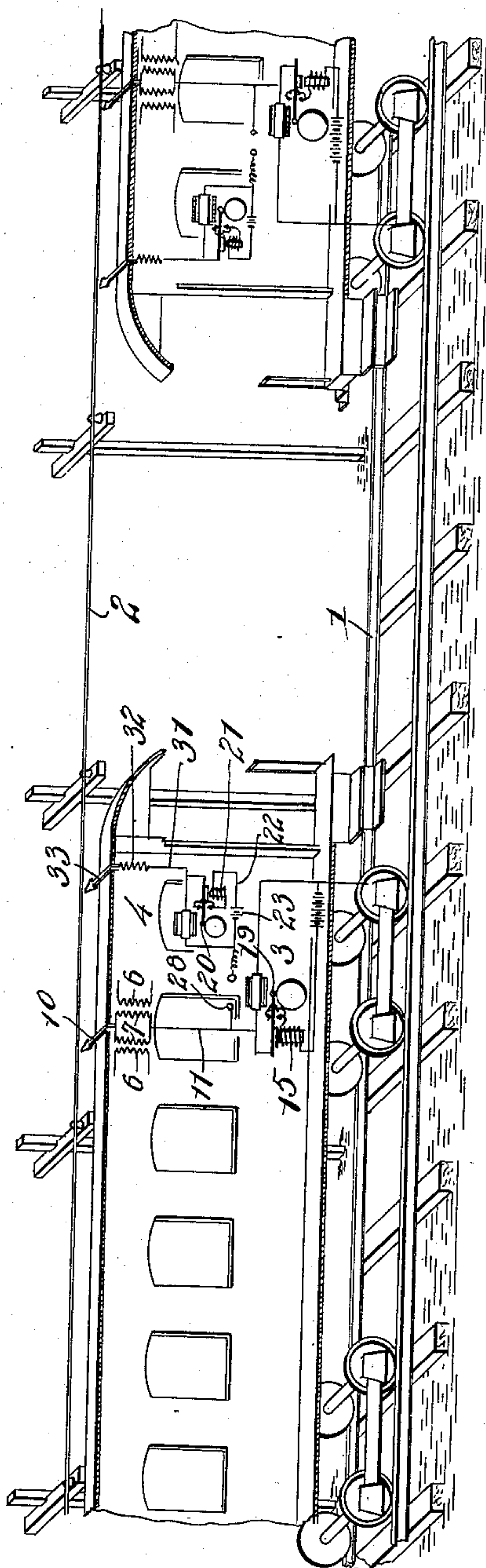
PATENTED JULY 16, 1907.

I. KITSEE.
SYSTEM FOR AUTOMATIC SIGNALING.

APPLICATION FILED FEB. 11, 1907.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

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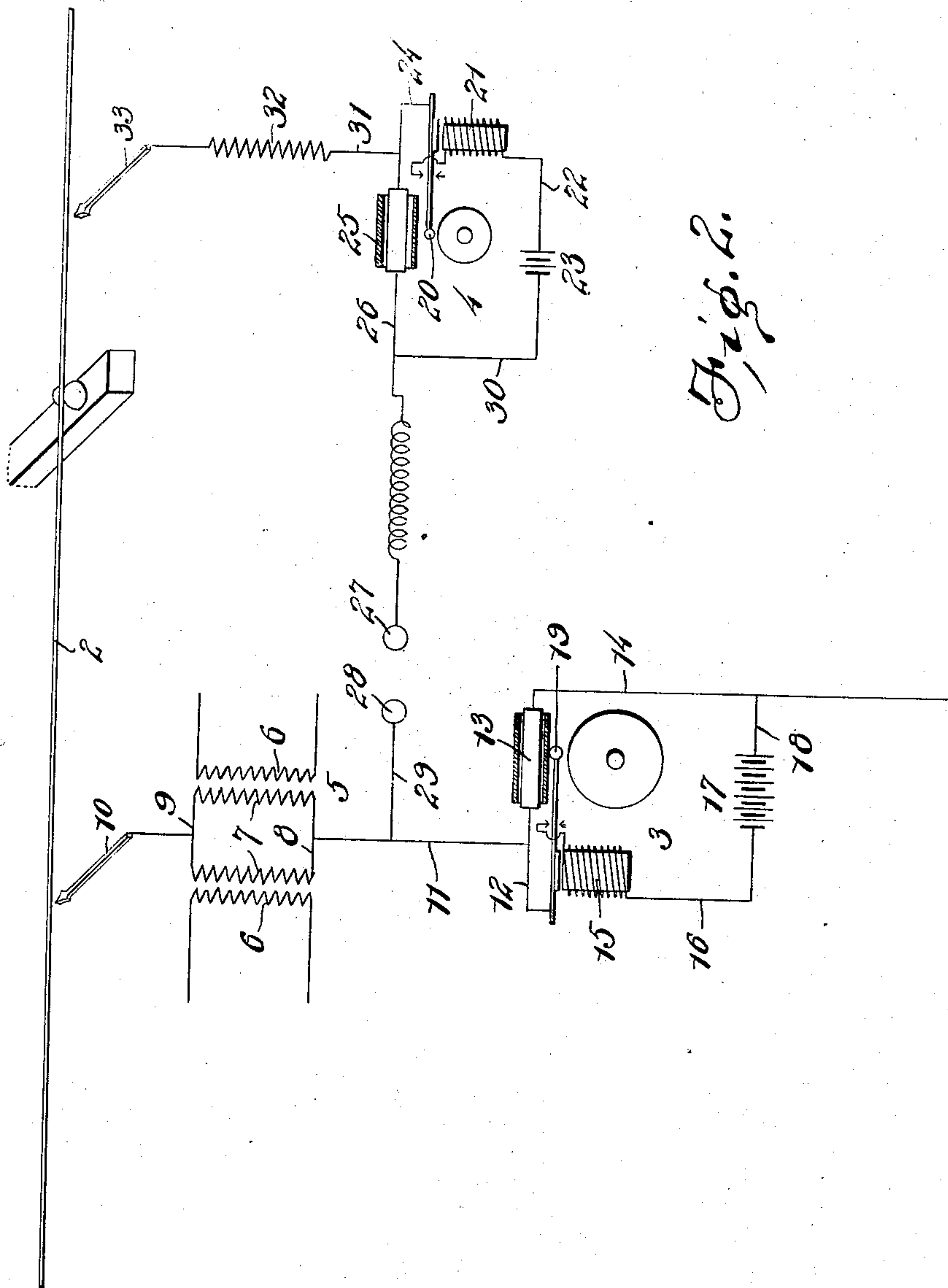
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2 SHEETS—SHEET 2.



Witnesses.

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SYSTEM FOR AUTOMATIC SIGNALING.

No. 859,950.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed February 11, 1907. Serial No. 356,796.

To all whom it may concern:

Be it known that I, ISIDOR KITSEE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Systems for Automatic Signaling; 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.

10 This invention relates to improvements in systems for automatic signaling, and it is more especially designed for signaling in connection with railways to enable the crews of trains or cars traveling either in the same or opposite directions readily determining the
15 location of each other with respect to the danger zone.

The present invention contemplates primarily the provision of a system of the character referred to adapted for signaling electrically through the medium of oscillatory current, to which end it aims to provide
20 means by which railroads may be equipped without the necessity of employing direct contacts or connections for the transmission of the signaling impulses, but which utilize aerial conductors in a manner similar to wireless telegraphy systems, thus affording an ef-
25 fectual path for the travel of the current without any direct connection between the moving vehicles and the stationary aerial conductor employed for the passage of the current from one train or car to another.

The invention further aims to provide a signaling sys-
30 tem in which is incorporated a main indicator or annunciator the condition of which is normally inactive in connection with which is also employed an auxiliary indicator or annunciator the condition of which is normally active, thus indicating safety and en-
35 abling the train or car to proceed without liability of collision with either an approaching train or car, or one that may be standing at rest. The relation, however, of the main and auxiliary indicators is such that when the train or car passes into the danger zone, as by
40 entering a block occupied by another train or car, the auxiliary indicator or annunciator is short-circuited, or shunted, thus rendering the same inactive, and the main indicator or annunciator is rendered active in order to notify the train crew of the presence of
45 danger.

With these general objects in view, and others that will appear as the nature of the improvements is better understood, the invention consists substantially in the novel construction, combination and arrangement of
50 parts hereinafter described, illustrated in the accompanying drawings, and pointed out in the appended claims.

While the particular form of the invention herein illustrated and described is believed to be a preferable
55 embodiment thereof, it is manifest that the same is susceptible of various changes in the form, proportion

and minor details of construction, and the right is accordingly reserved to modify or vary the invention as falls within the spirit and scope thereof.

In the drawings—Figure 1 is a perspective view 60 illustrating the application of the herein-described system of signaling. Fig. 2 is a diagrammatic view, on an enlarged scale, of the circuits and devices included therein carried by a train or car.

It will, of course, be understood that the present 65 invention is applicable to any railroad, irrespective of the motive power thereof, and the invention is therefore not circumscribed in its adaptation.

Referring in detail to the drawings, the numeral 1 designates the track of a railway, which track is elec- 70 trically divided into blocks through the medium of suitable insulation, as is customary with block signaling systems, and located adjacent to the track 1, and extending along the same, is an aerial conductor 2 the purpose of which will presently appear. 75

Each train or car is provided with the apparatus shown diagrammatically in Fig. 2, and including a main indicator or annunciator 3, and an auxiliary indicator or annunciator 4, together with the necessary appurtenances and adjuncts to be described. This ap- 80 paratus is precisely the same on each train or car, and referring to Fig. 2 it will be observed that in connection with the main indicator or annunciator 3 is employed a source of oscillatory current 5. The apparatus by which the oscillatory current is obtained forms no essential part 85 of this invention, but a preferred embodiment thereof is shown in the drawings to be a pair of primaries 6, the secondaries 7 of which are oppositely wound, the terminals of the secondaries 7 being connected by conductors 8 and 9, and to the latter is connected an aerial 90 terminal 10 the free end of which extends to a point in proximity to the stationary aerial conductor 2, whereby the oscillatory current may pass from the aerial terminal 10 to the conductor 2. This aerial terminal is illustrated in the form of a projecting arm, 95 but it is manifest that any other particular form may be employed. Connected to the conductor 8 is a conductor 11 that in turn is connected to a conductor 12. One terminal of the conductor 12 is connected to a coherer 13 from which leads a conductor 14, and the 100 latter is connected, through the medium of the wheels of the train or car, as clearly seen in Fig. 1, to the track 1. The track 1, therefore, acts in the capacity of a return, but if it is desired the conductor 14 may be grounded to earth in lieu of utilizing the track 1 for the 105 return. The other terminal of the conductor 12 is connected to a make and break device 15. This may be of any approved construction, and the make and break device 15 in turn is connected through a conductor 16 to one pole of a local battery 17 the other pole of which 110 is connected through a conductor 18 to the conductor 14. The coil of the device 15 acts as an impedance.

The make and break device 15, however, is shown to include an electro-magnet the armature of which carries a hammer 19, the latter acting upon the main indicator or annunciator 3, which is in the form of a bell, in order to sound the same, and said hammer also acts upon the coherer 13 for agitating the conducting particles therein.

The auxiliary indicator or annunciator 4 is arranged in shunt relation to the main indicator or annunciator, and coacting with the auxiliary indicator or annunciator, which is shown to be in the form of a bell, is a hammer head 20 carried by the armature of a make and break device 21, which device also includes an electro magnet, and said make and break device is connected through a conductor 22, to a local battery 23, the other terminal of the make and break 21 being connected through a conductor 24 to a coherer 25, which latter in turn is connected by a conductor 26 to an adjustable terminal 27 that coöperates with a fixed terminal 28 connected by a conductor 29 to the conductor 11. By reason of the adjustability of the terminal 27 it is apparent that the space between the same and the fixed terminal 28 may be varied in order to furnish the necessary gap between said terminals for the passage of the current as will be presently explained. The battery 23 is also connected to the conductor 26 by a conductor 30, and leading from the conductor 24 is a conductor 31 connected to a coil 32, which latter in turn is connected to an aerial terminal 33. The construction of the terminal 33 is similar to the aerial terminal 10.

In the operation of the herein-described signaling system the main indicator or annunciator 3 is normally inactive. This is due to the fact that this indicator only operates when there are two trains or cars in the same block, thus establishing a complete circuit through the conductors 14, or through ground if the conductors 14 are grounded. The oscillatory current being generated in the apparatus designated by the numeral 5 will therefore flow from the aerial terminal 10 through the gap between the free end thereof and the stationary conductor 2, from which latter, there being no other train or car in the block, the oscillatory current will jump the gap between the conductor 2 and the aerial terminal 33, whence it flows through the coil 32, the conductor 31, the coherer 25, and the conductor 26, to the adjustable terminal 27. Here the current jumps the gap to the fixed terminal 28, from where it flows, by means of the conductor 29 back to the source 5. Thus, so long as there is but one train or car in the block, the current will traverse this circuit, but in passing through the coherer 25 the effect of the latter upon the circuit including the local battery 23 is modified to such an extent as to permit the make and break device 21 being actuated by the current from the local battery 23, and consequently the auxiliary indicator or annunciator is continually sounded. This, therefore, notifies the train crew that the traffic conditions of the track are perfectly normal or safe, and the train is thus enabled to proceed without liability of collision.

The operation above described, as indicated, contemplates the normal or safe condition of the track. Should, however, the train or car enter the danger zone, as by entering a block occupied by another train or car, a conducting path is immediately provided

through the rails 1, and consequently the current from the aerial conductor 2 in lieu of passing through the aerial terminal 33 will pass through the terminal 10 of the other train or car, and thus short circuit or shunt the auxiliary indicator or annunciator 4. By reason of this the latter will cease to operate. The current from the aerial conductor 2 will now pass to the aerial conductor 10 of the car or train previously occupying the block upon which the approaching car or train has entered, and will flow through the conductor 14 of that particular train or car to the track 1, whence it returns to the approaching train or car through its conductor 14. A circuit will therefore be established in the approaching train or car through the conductor 14, the coherer 13, the conductor 11, the conductor 8, secondaries 7, conductor 9 and aerial terminal 10 to the aerial conductor 2, and likewise through the train or car that is being approached, but in the latter case the current will enter through the aerial terminal 10 and pass to the track 1 through the connections just described. The flow of the current through the coherer 13 will modify its effect upon the circuit containing the local battery 17, and the make and break 15 will therefore be operated to sound the main indicator or annunciator, the latter thus becoming active, and indicating to the train crew the presence of danger. When one of the trains or cars has passed out of the block, it is manifest that the circuit through the conductors 14 and the track 1 will be broken, whereupon the main indicators or annunciators cease to operate, the auxiliary indicators or annunciators are again rendered active, and the train crews are thereby notified that traffic conditions are again normal or safe, thus enabling the train or car to proceed without danger of collision.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:—

1. In a signaling system of the character described, a road bed divided electrically into blocks, an aerial conductor associated therewith, and signaling devices mounted to travel upon the road bed, said signaling devices including indicators, a source of oscillatory current associated therewith, means by which a path for said current is established between the aerial conductor and said indicators, and means to normally localize the impulses.

2. In a signaling system of the character described, a road bed divided electrically into blocks, an aerial conductor associated therewith, and signaling devices mounted to travel upon the road bed, said signaling devices including main indicators the condition of which is normally inactive, auxiliary indicators associated therewith the condition of which is normally active, means by which a path for said current is established between the aerial conductor and said indicators, and means to normally localize the impulses to maintain the auxiliary indicators normally active.

3. In a signaling system of the character described, a road bed divided electrically into blocks, an aerial conductor associated therewith, and signaling devices mounted to travel upon the road bed, said signaling devices including indicators the condition of which is inactive during the normal or safe condition of the road bed, means for rendering said indicators active when the danger zone is entered, means by which a path for said current is established between the aerial conductor and said indicators, and means to normally localize the impulses.

4. In a signaling system of the character described, a road bed divided electrically into blocks, an aerial conductor associated therewith, and signaling devices mounted to travel upon the road bed, said signaling devices includ-

ing main indicators, auxiliary indicators associated there-
with, the main and auxiliary indicators during the normal
or safe condition of the road bed being inactive and active,
respectively, means for rendering the main and auxiliary
5 indicators respectively ctive and inactive when the danger
zone is entered, means to normally localize the impulses
to maintain the auxiliary indicators normally active, and
means by which a path for said current is established be-
tween the aerial conductor and said indicators.

10 5. In a signaling system of the character described,
a road bed divided electrically into blocks, an aerial con-
ductor associated therewith, a source of oscillatory cur-
rent, main signaling devices mounted to travel upon said
road bed and associated directly with said source of os-
15 cillatory current, but inactive during the normal or safe
condition of the road bed, and auxiliary signaling devices
arranged in shunt relation to said main signaling devices,
said auxiliary signaling devices being normally active but
rendered inactive when the danger zone is entered, and
20 means by which a path for said current is established be-
tween the aerial conductor and said indicators.

6. In a signaling system, an aerial conductor, means
located on a traveling vehicle to impress impulses upon
said aerial conductor, means to normally localize said
impulses, indicating devices also carried by the traveling 25
vehicle, and means whereby said indicating devices are
rendered operative when the danger zone is entered.

7. In a signaling system, an aerial conductor, means
located on a traveling vehicle to impress impulses upon
said aerial conductor, main and auxiliary indicators car- 30
ried by the traveling vehicle, means to normally localize
the impulses to maintain the auxiliary indicators nor-
mally active, and means whereby said main indicators are
rendered active when the danger zone is entered.

In testimony whereof I affix my signature, in the pres- 35
ence of two witnesses.

ISIDOR KITSEE.

Witnesses:

EDITH R. STILLEY,
MARY C. SMITH.