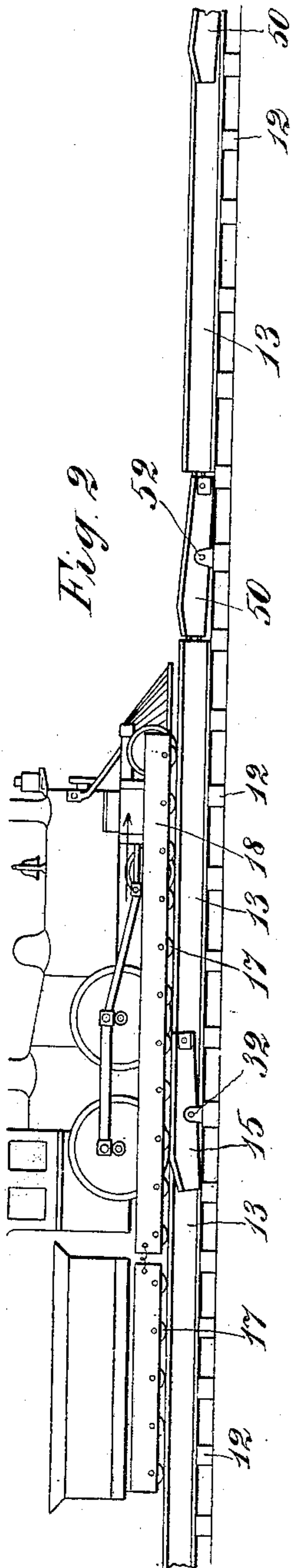


J. W. LEDWON.
SAFETY DEVICE FOR RAILROADS.
APPLICATION FILED OCT. 27, 1908.

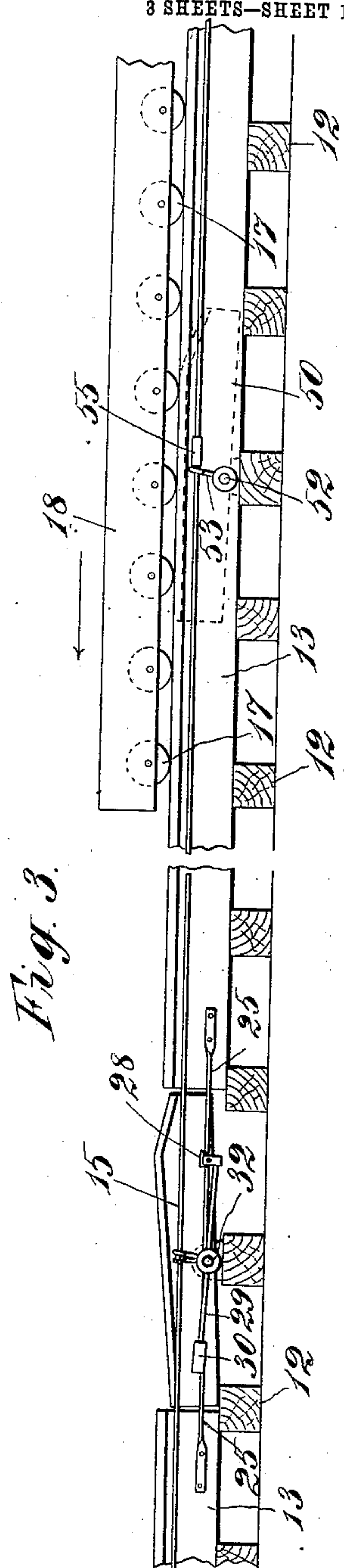
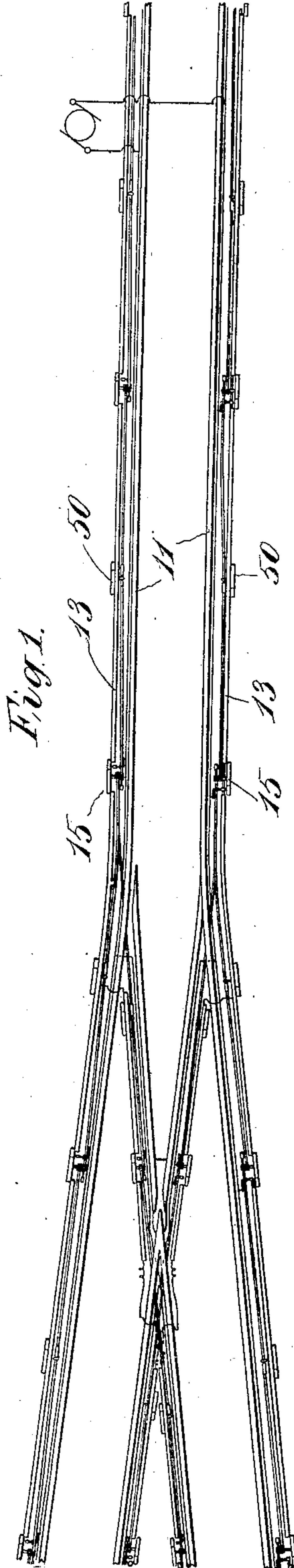
924,910.

Patented June 15, 1909.

3 SHEETS—SHEET 1.



WITNESSES
Geo. C. Cheney
Mary L. Chynett



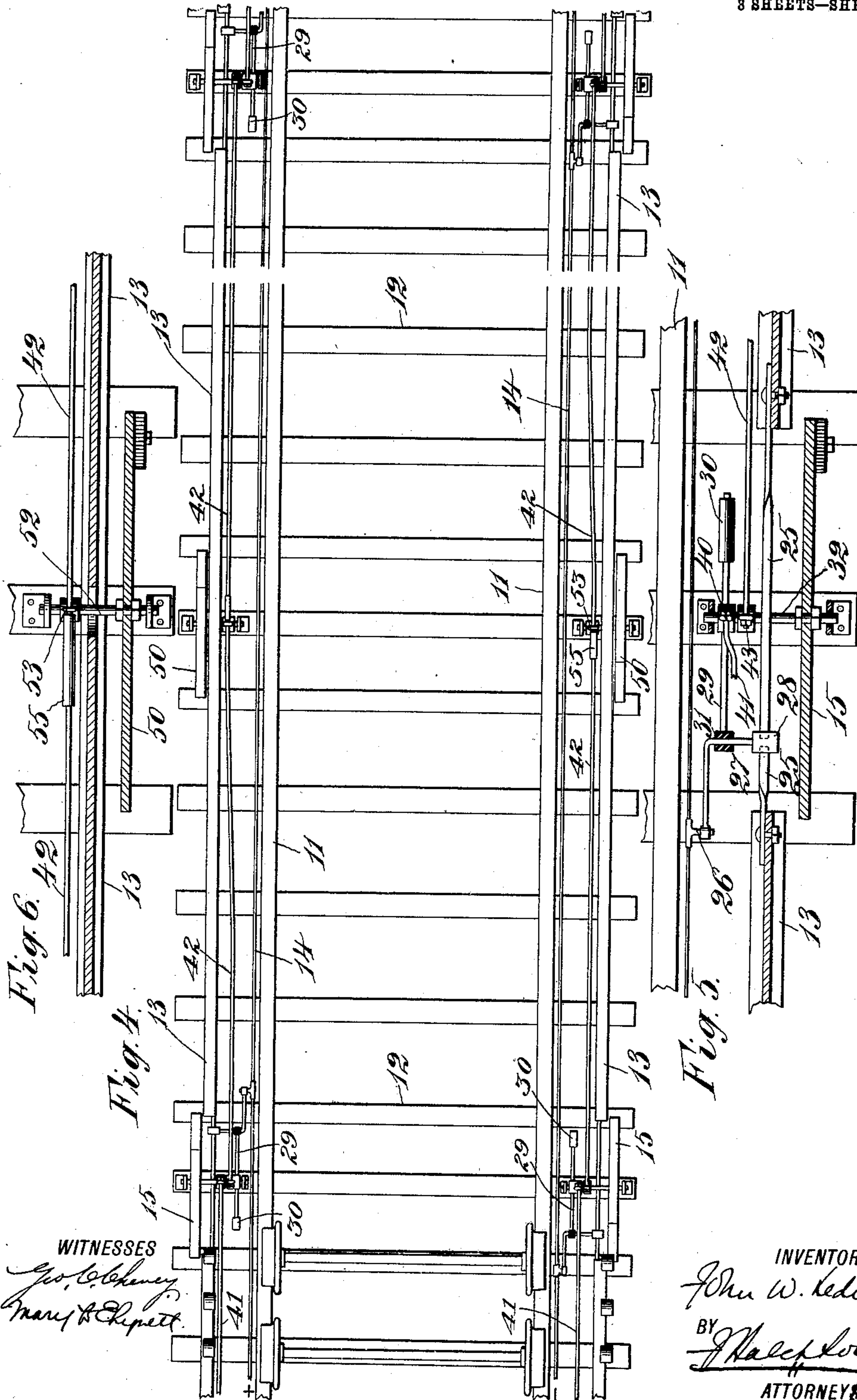
INVENTOR
John W. Ledwon
BY *W. H. Morris*
ATTORNEYS

J. W. LEDWON.
SAFETY DEVICE FOR RAILROADS.
APPLICATION FILED OCT. 27, 1908.

924,910.

Patented June 15, 1909.

8 SHEETS—SHEET 2.



WITNESSES
Geo. C. Cheney
Mary B. Chipett

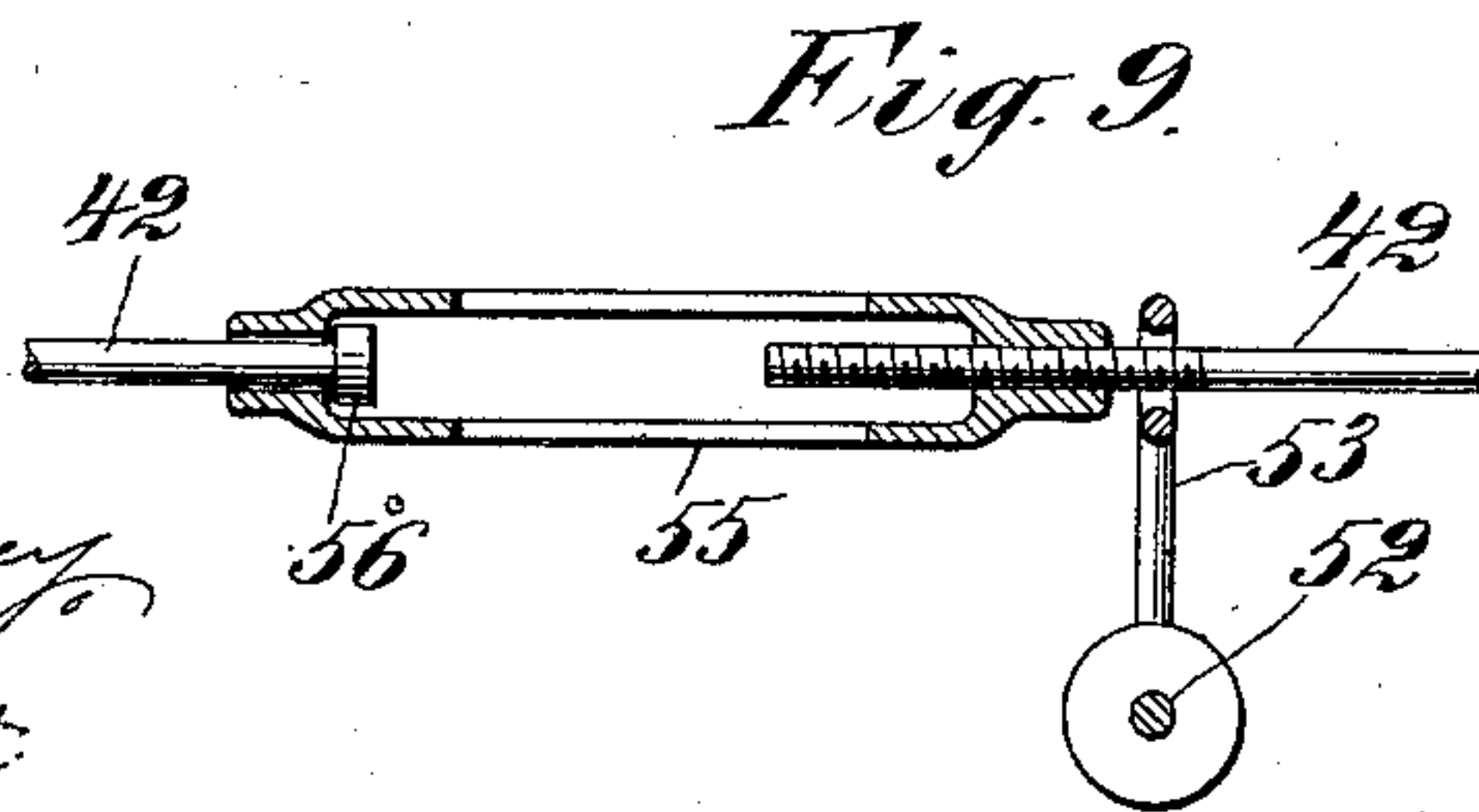
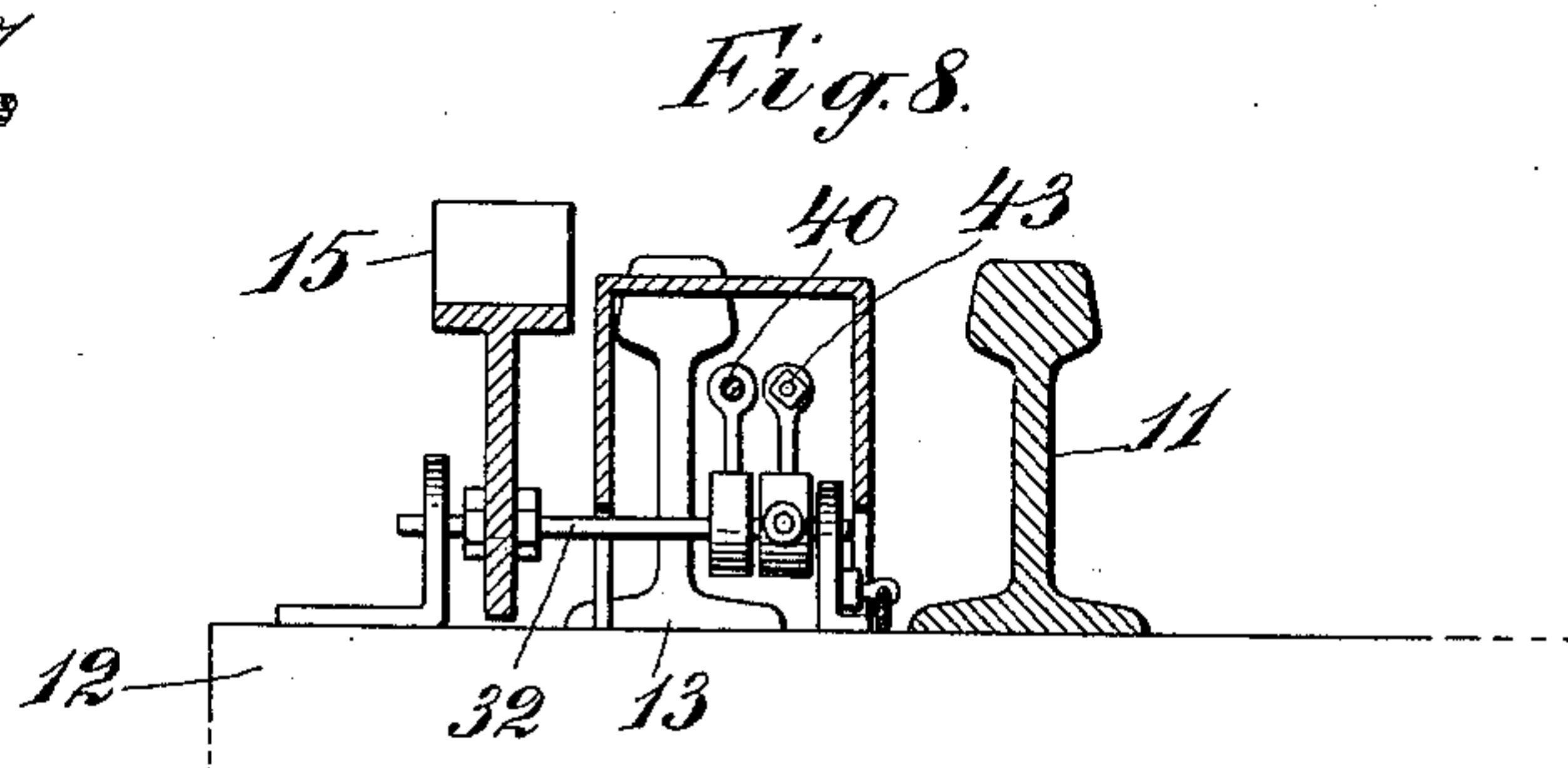
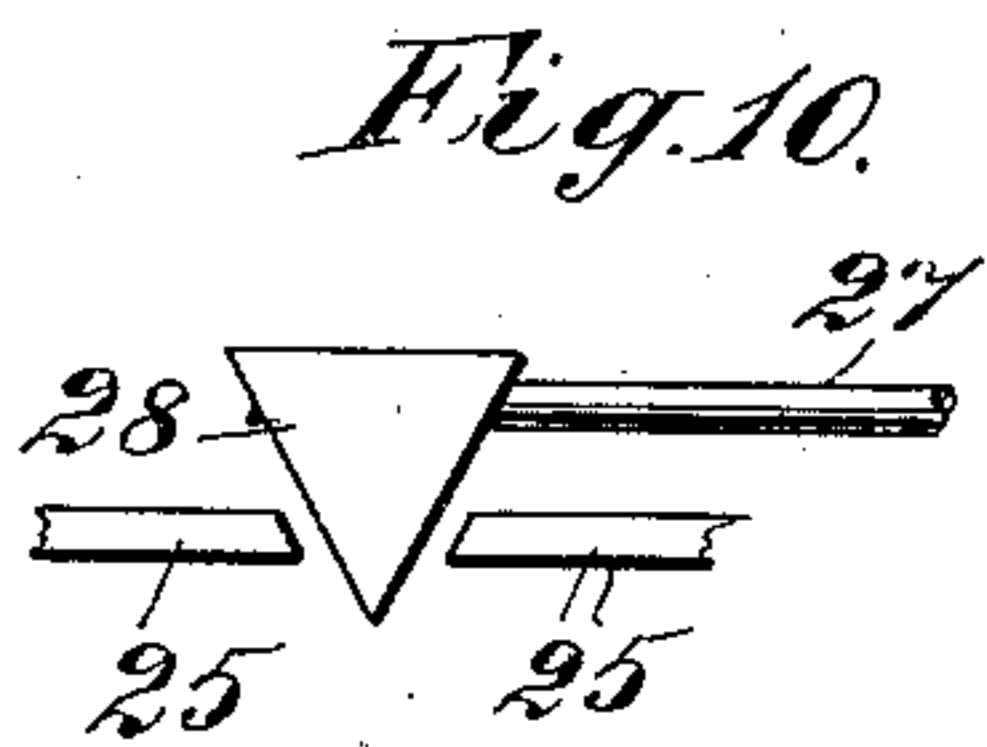
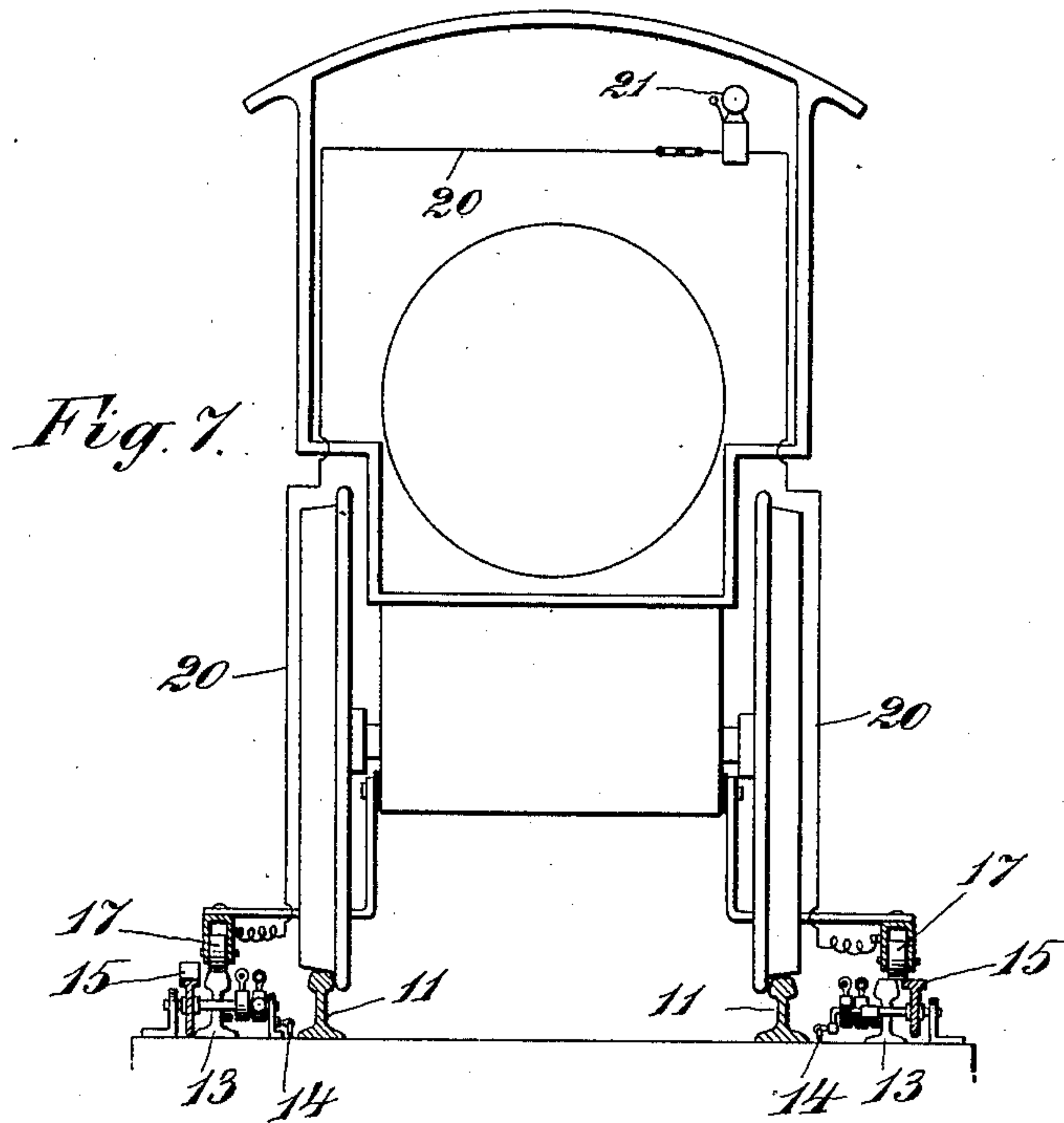
INVENTOR
John W. Ledwon
BY *W. H. Lewis*
ATTORNEY

J. W. LEDWON.
SAFETY DEVICE FOR RAILROADS.
APPLICATION FILED OCT. 27, 1908.

924,910.

Patented June 15, 1909.

3 SHEETS—SHEET 3.



WITNESSES
John W. Ledwon
Marshall Chipmott

INVENTOR
John W. Ledwon
BY *Marshall Chipmott*
ATTORNEY

UNITED STATES PATENT OFFICE

JOHN W. LEDWON, OF SOUTH RIVER, NEW JERSEY.

SAFETY DEVICE FOR RAILROADS.

No. 924,910.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed October 27, 1908. Serial No. 459,708.

To all whom it may concern:

Be it known that I, JOHN W. LEDWON, a citizen of the United States, and a resident of South River, in the county of Middlesex, State of New Jersey, have invented certain new and useful Improvements in Safety Devices for Railroads, of which the following is a specification.

My invention relates to safety devices for railroads and more particularly to means adapted to prevent the meeting or collision of two trains which may at any time be approaching each other on the same track.

It is well known that on most railroads with the exception of the great trunk lines, reasons of economy prevent the supplying of a double track equipment, a single track being used for the passage of trains in both directions, switches being provided at intervals for the purpose of allowing trains to pass each other. From various causes, however, such as the misunderstanding of orders or the carelessness of engineers, trains are apt to meet between switches, and, unless some means are provided for warning the respective engineers in time of the approach of another train, disastrous head-on collisions are apt to occur.

The invention consists in the novel construction, arrangement and combination of various coöperating devices and parts, as hereinafter more particularly described.

In the accompanying drawings Figure 1 is a general plan view of a railroad track equipped according to my invention, showing also the arrangement of the same at a switch or crossing; Fig. 2 is a side view of a locomotive and tender showing the portion of my invention which is applied to the outside of the same and also showing the arrangement of certain parts of the same which lie alongside of the rails of the track; Fig. 3 is an enlarged view in side elevation of the additional or signal controlling rails, viewed from between the rails; Fig. 4 is an enlarged plan view of the track and other parts, showing the same more in detail; Fig. 5 is a still further enlarged plan view of the details of certain operating parts at the junctions of the blocks or sections; Fig. 6 is a view of certain other coöperating devices located between the junctions of the sections; Fig. 7 is an end view of a locomotive engine equipped with my invention (partially diagrammatic) and showing also the rails and other coöperating parts; Figs. 8, 9 and 10

are detail views, which will be more particularly hereinafter described.

In carrying my invention into effect, and applying the same to an ordinary single track railroad, which is provided with rails 11 of the usual or any ordinary form, secured to ties 12, I provide additional rails 13, located outside of the rails 11 upon which the wheels of the train roll. These rails 13 may be secured to the road bed in any suitable manner, but must be electrically insulated therefrom, and the rails on each side of the track must be electrically insulated from the rails on the other side of the track. All the rails 13, however, comprised within a single section or block, as hereinafter explained, must be electrically connected with each other, and each section or block must be normally insulated from every other section or block. These sections or blocks may be each say about one thousand feet in length.

At some suitable place along the line of the road a source of electricity is provided, and the current therefrom is led into conductors 14 which pass along both sides of the track, being of course insulated therefrom. The conductors on one side of the track are of course positive and on the other side are negative. The electric current from these conductors 14 is the means by which the signals are given to the respective engineers when two trains approach within a certain distance of each other, and the means by which this is effected will now be described.

On each side of the track and between each block or section are located rocking levers 15, which may be composed of sections of rail with inclined upper surfaces; the form of these is best shown in Fig. 3. These rocking levers 15 are in a line outside of that of the rails 13, and are pivotally supported upon one of the ties 12 as shown, and are connected with mechanism hereinafter to be particularly described by means of which the electric current is communicated from the conductors 14 to the rails 13. The rocking of the levers 15 is effected by means of wheels or rollers 17 which are attached to a frame 18 secured on each side of the locomotive and tender as shown in Fig. 2, the distance laterally thereof from the locomotive being such that the wheels on the right hand side will run over the rails 13 and will also, upon reaching one of the rocking levers 15, run along and operate the same, while on the left

hand side of the engine the distance is such that the wheels or rollers 17 run along the rails 13 but do not operate the rocking levers 15 on that side.

5 Referring more particularly to Fig. 5, it will be seen that the rails 13 are provided with rods 25, which are electrically extensions of said rails. These rods 25 do not quite touch end to end, but are separated by
10 a short interval, as particularly shown in Fig. 10. At certain intervals on the conductors 14 are laterally projecting studs 26, on which is pivotally mounted an arm 27 which bears at its end a wedge-shaped circuit-closer 28 (see Fig. 5.) When this arm is lowered and the circuit-closer 28 brought into
15 contact with the ends of the rods 25 (Fig. 10) a current of electricity is led from the conductors 14 into both of the rails 13 which are touched by the circuit-closer. The arm
20 27 is normally held up however, and the circuit-closer 28 out of contact with the rails 13, by means of the lever 29 and counterweight 30, the lever 29 being connected to the arm
25 27 by the sleeve 31, which however is constructed of some suitable non-conducting material so that the arm 27 and lever 29 are electrically insulated from each other. The lever 29 is loose upon the shaft 32, and is provided with an upwardly projecting arm 40,
30 from which extends backward a rod 41, which may be constructed of sections or parts of any convenient length attached together as hereinafter described, this sectional rod extending backward the length of one
35 block or section of track, say about 1,000 feet, and its rearward end being connected to the rocking lever at that point in the same way as is the corresponding forwardly extending rod 42, which is secured at its rear
40 end to an upwardly projecting arm 43 on the rocking lever 15. The rocking lever 15 is fast upon its shaft, and when the rocking lever and shaft are operated by the passage of
45 an engine, the lever 29 upon that shaft with its rod 41 are not operated, but the forwardly extending rod 42 is operated, resulting in drawing backward the arm 40 on the lever 29 at the next forward block or section junction and the consequent operation of the lever 29 and the arm 27, which is allowed to
50 fall, thus bringing the circuit-closer 28 into contact with the rods or extensions 25 of the rails 13. By this means, it will be seen the
55 rails 13 on both sides of the circuit-closer 28 on one side of the engine are electrically connected with the conductor 14, and thereby also the wheels 17, the engine circuit 20, and the wheels 17 on the other side of the engine
60 and the one particular rail 13 on that side with which the wheels 17 happen to be in contact. Inasmuch however as the rocking levers 15 on that side (the left-hand side) of the engine are not operated, no other rails on
65 that side are made alive except the particu-

lar one touched. As will be readily seen, the effect of all this is, when a locomotive and tender passes along the track and comes into the position shown in Fig. 2, to electrically
70 connect the block or section of the rails 13 which lies next in front of the engine with that block or section which lies still next in front, on the right hand side of the engine, and to conduct a current of electricity into
75 both of these sections; while on the left hand side of the engine, since the wheels or rollers 17 run over the rails but do not operate the rocking levers 15, the blocks or sections on that side remain dead.

The wheels or rollers 17 on each side of the
80 engine are electrically connected to a circuit 20 which passes up through the engineer's cab and comprises a bell 21, or a lamp or any other suitable form of signal. It will be obvious that when a current passes through
85 this circuit 20 the signal 21 will be operated; but this cannot occur as long as the rails 13 on the left hand side of the engine remain unconnected with the conductor 14 on that side and therefore dead.
90

Since the wheels or rollers 17 on the right hand side of each engine are so located as to operate the rocking levers 15 and thereby to lead current into the rails 13, it is obvious that an engine approaching in the opposite
95 direction from that which is shown in Fig. 2, will operate the rocking levers on the opposite side of the track from those which are operated by an engine running in the first mentioned direction. This will of course
100 have the effect of making the rails which are on the right hand side of the approaching engine, and consequently on the left hand side of the first mentioned engine, alive. When this occurs, since the live rails 13 on
105 one side are positive and the live rails 13 on the other side are negative, a current of electricity will pass through the circuits and signals of both of the engines, as soon as they approach within the requisite distance, and
110 thus give warning to the engineers of both. As thus far explained, however, the signals would cease to operate and my invention become inoperative as soon as either locomotive left the rocking lever 15, and passed in-
115 side of the portion of the track to be protected.

In order to provide for the continued operation of the signals even though two engines still approach each other, I provide the
120 mechanism shown more particularly in Fig. 6. This mechanism comprises a series of rocking levers 50, similar to those above described, fast on shafts 52, each shaft being provided with an upwardly projecting arm
125 53. These rocking levers 50 are located along the track between the rocking levers 15 at the junctions of the blocks and sections, and at such a distance from each other that at all times when an engine is passing along,
130

some particular rocking lever, either 15 or 50, may be depressed and thereby the signals operated. The means by which the signals are operated by the intermediate rocking levers is as follows: The forwardly-extending rod 42 above referred to is, as was said, composed of sections. These sections are joined together in the manner shown in Fig. 9, where the rear end of each portion of the rod 42 is shown secured to a screw-buckle 55, while the forward end of the next portion plays freely in the rear end of the screw-buckle, being prevented however from becoming disengaged therefrom by a head 56. In this Fig. 9, 53 shows the upwardly projecting arm on the shaft 52 of the intermediate rocking arms 50. It will be seen that the effect of these various means, through the operation of any rocking-lever 15, is to operate the whole length of the rod 42 extending forwardly therefrom, thereby operating the next forward lever 29 and connected mechanism, while the operation of any one of the intermediate rocking-levers 50 communicates motion to all that portion of the rod 42 which is in front of it, up to the next block or section junction, while not operating all that portion of the rod 42 which lies behind, thus avoiding unnecessary friction and wear and tear.

In cold weather, a current of electricity may be led into the shafts 32 and 52, rocking-levers 15 and 50, and rods 42. This will prevent freezing and clogging of the joints, without prematurely operating the signals.

What I claim as new is as follows:

1. In an apparatus of the class described, the combination with a railway and vehicles thereon; of a source of electric current; positive conductors leading therefrom on one side of the railway; negative conductors leading therefrom on the other side of the railway; additional conductors on each side of the railway, divided into blocks or sections, each of said blocks or sections being normally insulated; devices between successive blocks or sections on the same side of the railway adapted to electrically connect two successive blocks or sections with each other and both with the conductor on that side of the railway leading to the source of current; means adapted to operate said last mentioned devices when a vehicle reaches the rear end of the rearmost of said two successive blocks or sections; means on the vehicles adapted to operate the last mentioned devices; and a circuit in each vehicle, electrically connected with said blocks or sections, and comprising a signal.

2. In an apparatus of the class described, the combination with a railway and vehicles thereon; of a source of electric current; positive conductors leading therefrom on one side of the railway; negative conductors leading therefrom on the other side of the railway;

additional conductors on each side of the railway, divided into blocks or sections, each of said blocks or sections being normally insulated; devices between successive blocks or sections on the same side of the railway adapted to electrically connect two successive blocks or sections with each other and both with the conductor on that side of the railway leading to the source of current; means adapted to operate said last mentioned devices when the vehicle reaches the rear end of the rearmost of said two successive blocks or sections; means adapted to maintain said electrically connecting devices in their operative position after the vehicle passes the rear end of the rearmost of said two successive blocks or sections; means on the vehicles adapted to operate the various before mentioned devices; and a circuit in each vehicle, electrically connected with said blocks or sections, and comprising a signal.

3. In an apparatus of the class described the combination with a railway and vehicles thereon; of a source of electric current; positive conductors leading therefrom on one side of the railway; negative conductors leading therefrom on the other side of the railway; additional conductors on each side of the railway, divided into blocks or sections, each of said blocks or sections being normally insulated; devices between successive blocks or sections on the same side of the railway adapted to electrically connect two successive blocks or sections with each other and both with the conductor on that side of the railway leading to the source of current, said devices comprising an arm pivotally connected with the conductor leading to the source of current, a lever adapted to operate said arm, and a circuit closer on the end of the arm adapted to contact with the ends of the said blocks or sections; means adapted to operate said last mentioned devices when a vehicle reaches the rear end of the rearmost of said two successive blocks; means adapted to maintain said electrically connecting devices in their operative position after the vehicle passes the rear end of the rearmost of said two successive blocks or sections; means on the vehicles adapted to operate the various before mentioned devices; and a circuit in each vehicle, electrically connected with said blocks or sections, and comprising a signal.

4. In an apparatus of the class described the combination with a railway and vehicles thereon; of a source of electric current; positive conductors leading therefrom on one side of the railway; negative conductors leading therefrom on the other side of the railway; additional conductors on each side of the railway, divided into blocks or sections, each of said blocks or sections being normally insulated; devices between successive blocks or sections on the same side of the railway

adapted to electrically connect two successive blocks or sections with each other and both with the conductor on that side of the railway leading to the source of current, said devices comprising an arm pivotally connected with the conductor leading to the source of current, a lever adapted to operate said arm, and a circuit closer on the end of said arm adapted to contact with the ends of the said blocks or sections; means adapted to operate said last mentioned devices when a vehicle reaches the rear end of the rearmost of said two successive blocks or sections, comprising a rocking lever and a rod extending forwardly from and adapted to be operated by the same, and connected with the lever arm and circuit closer above described; means adapted to maintain said electrically connecting devices in their operative position after the vehicle passes the rear end of the rearmost of said two successive blocks or sections; means on the vehicles adapted to operate the various before mentioned devices; and a circuit in each vehicle, electrically connected with said blocks or sections, and comprising a signal.

5. In an apparatus of the class described the combination with a railway and vehicles thereon; of a source of electric current; positive conductors leading therefrom on one side of the railway; negative conductors leading therefrom on the other side of the railway; additional conductors on each side of the railway, divided into blocks or sections, each of said blocks or sections being normally in-

sulated; devices between successive blocks or sections on the same side of the railway adapted to electrically connect two successive blocks or sections with each other and both with the conductor on that side of the railway leading to the source of current, said devices comprising an arm pivotally connected with the conductor leading to the source of current, a lever adapted to operate said arm, and a circuit closer on the end of said arm adapted to contact with the ends of the said blocks or sections; means adapted to operate said last mentioned devices when a vehicle reaches the rear end of the rearmost of said two successive blocks or sections; means adapted to maintain said electrically connecting devices in their operative position after the vehicle passes the rear end of the rearmost of said two successive blocks or sections, comprising rocking levers and rods forwardly extending therefrom and connected with the lever arm and circuit closer hereinbefore mentioned; means on the vehicles adapted to operate all of the beforementioned devices; and a circuit in each vehicle, electrically connected with said blocks or sections, and comprising a signal.

In witness whereof, I have hereunto signed my name this 17th day of October, 1908, in the presence of two witnesses.

JOHN W. LEDWON.

Witnesses:

O. B. HASTINGS,
MARY D. E. LYNETT.