(No Model.)

2 Sheets—Sheet 1.

F. S. GUERBER.

SAFETY APPLIANCE FOR RAILWAYS.

No. 365,002. Patented June 14, 1887.

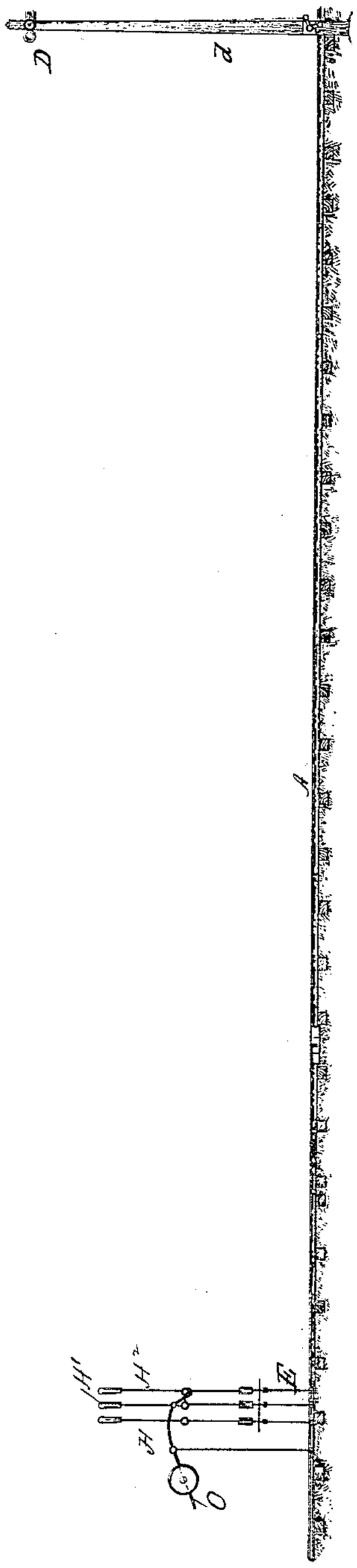

Fig. 1.

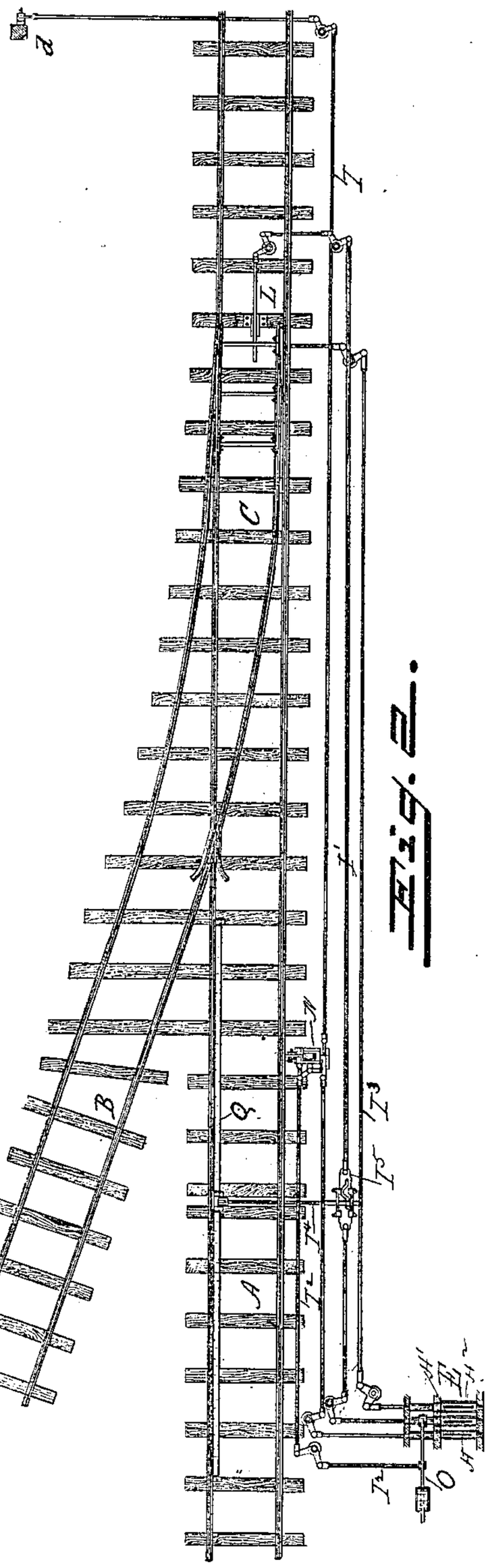

Fig. 2.

WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

F. S. GUERBER.

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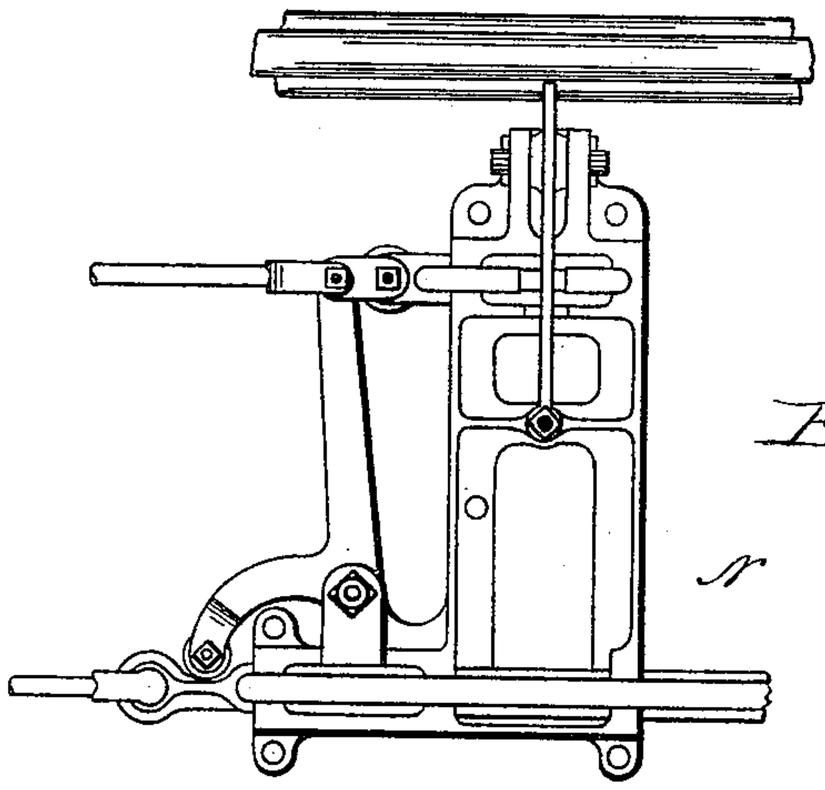

Fig. 3.

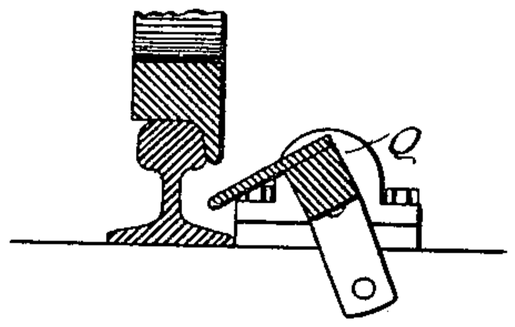

Fig. 4.

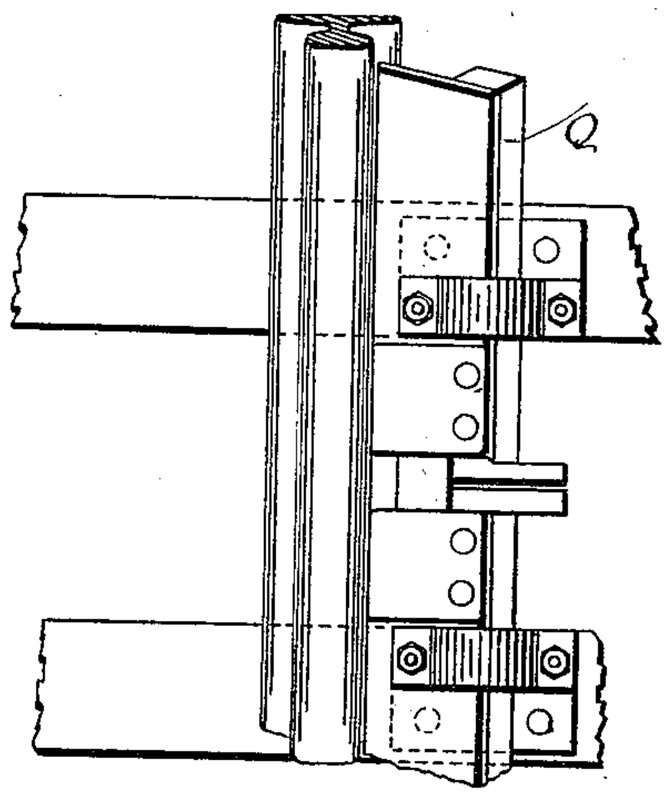

Fig. 5.

Witnesses
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UNITED STATES PATENT OFFICE.

FREDERICK S. GUERBER, OF ALLENTOWN, PENNSYLVANIA.

SAFETY APPLIANCE FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 365,002, dated June 14, 1887.

Application filed July 28, 1886. Serial No. 209,307. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK S. GUERBER, a citizen of the United States, residing at Allentown, in the county of Lehigh and State of Pennsylvania, have invented certain new and useful Improvements in Safety Appliances for Railways; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a side elevation, and Fig. 2 a plan view, of a portion of track and a switch having my safety appliance attached thereto. Fig. 3 is a plan view of a track-instrument. Fig. 4 is a vertical transverse section of a safety-bar. Fig. 5 is a plan view of same.

My invention has relation to safety appliances for railways, and has for its object to provide a combination and arrangement of parts, whereby the entire portion of the track to which a signal is assigned will be fully protected thereby, so that after a track has been once cleared for the passage of a train and a signal given to that effect no change in the switches or locks or other appliances covered by the signal can be made until the train has passed completely out of and beyond the section or portion of the track to which the signal pertains.

My invention consists in the peculiar combination and arrangement of parts, hereinafter fully described and claimed.

In carrying my invention into effect I employ interlocking apparatus of such construction that after a switch has been moved and the track cleared a lock is effected, whereby the switch cannot be moved until the signal is reversed or set to "danger." I also employ a safety-bar so located with reference to the switch that until a train has passed off the switch the latter cannot be moved, and a "track-instrument," which puts an additional lock on the switch by locking the interlocking apparatus, such track-instrument being operative by a passing train, so as to automatically unlock the lock of such instrument.

It very frequently happens that within a given space or section covered or protected by one signal there will be several switches or crossings, each of which, under ordinary arrangements, requires a safety-bar, so that under such circumstances several safety-bars are required in the space or section covered by one signal. By my invention, employing only one safety-bar and one track-instrument, in conjunction with an interlocking apparatus and a signal, the entire distance or section of track to which such signal pertains is perfectly protected, whether there be only one switch or crossing in such section, or whether there be several switches, crossings, or danger-points, such protection extending not only to the switch within the section, but to and beyond the fouling-point, as hereinafter set forth.

My improvements consist, essentially, in the combination, with an interlocking apparatus for moving a switch and signal, of a track-instrument and a safety-bar, each of which puts an additional lock on the interlocking apparatus, and which coact in the manner hereinafter described, said safety-bar and track-instrument being so located with reference to each other that a passing train will be upon the safety-bar before the track-instrument is operated to unlock, and will also continue upon said bar after the unlocking operation of the track-instrument, as hereinafter fully described.

In the accompanying drawings I have illustrated my invention as applied to a railway-track having only one switch connected therewith; but it may be applied in the same manner to a track having a series of switches or other danger-points in it.

In said drawings, A represents the main track, B the siding or shunt, and C the switch connecting said main track and siding. The section of track shown is supposed to be so much of the track as is protected by one signal, D, which is shown as mounted upon a post, *d*.

E is an interlocking apparatus, which may be of any usual or suitable construction, in which, before the switch can be moved, the signal must be set to "danger," and in which the setting of the signal to "safety" locks the switch against movement until said signal has again been set to "danger." It also includes, preferably, but not necessarily, means whereby, after the switch has been moved, it is locked at the switch by a lock not in the interlocking apparatus, so that said switch is locked by the

interlocking apparatus and by a separate lock or switch-lock before the signal can be moved to "safety."

I prefer to employ the interlocking apparatus shown and described in my application for Letters Patent of the United States, filed April 30, A. D. 1886, Serial No. 200,715; but any other interlocking apparatus of proper construction may be employed for carrying my present invention into effect.

H H′ H^2 represent levers of the interlocking apparatus, H being the lever whereby the signal is moved, H′ the lever for moving the switch-lock L, and H^2 the lever whereby the switch is moved. Before moving the switch the lever H must be thrown to set the signal at "danger," and the lever H′ moved to unlock the lock L.

I represents a connection leading from the lever H to the signal.

I′ represents a similar connection, leading from the lever H′ to the switch-lock L, and I^3 represents a connection leading from lever H^2 to the switch C.

N is a track instrument or device whereby, when the signal is set to "safety," the interlocking apparatus is locked, so that neither the lever H′ nor lever H^2 can be moved until a train passes and automatically unlocks the interlocking apparatus from the lock of the track-instrument. Said track-instrument may be of any desired or suitable construction, but is preferably constructed as shown and described in an application of mine of even date herewith, Serial No. 209,306, for Letters Patent, and as illustrated in Fig. 3 of accompanying drawings. Said track-instrument is connected with the signal-connection I, so as to be set when the latter is moved to put the signal at "safety;" and it has also a connection, I^2, with a weighted lever, O, whereby when the signal is set to "safety" the track-instrument locks the lock-lever H′, so that the lock L cannot be unlocked until the train passes, and, operating upon the track-instrument N, effects a movement of the lever O, which unlocks the interlocking cylinder to which said lever H′ pertains.

Q is a safety-bar which has a connection, I^4, with the switch-lock connection I′, (preferably through the medium of a motion-plate, I^5,) which safety-bar prevents the lock L from being moved while the train is over said safety-bar. This safety-bar may be of any desired construction, but is preferably constructed in the manner shown and described in an application of mine for Letters Patent of the United States, filed April 30, A. D. 1886, Serial No. 200,719, and as illustrated in Figs. 3, 4, and 5 of the accompanying drawings. The safety-bar Q and track-instrument N are preferably located opposite to one another and beyond the fouling-point of the siding B and main track A and at the extreme or remote point of said track to which the signal D pertains or which is protected by such signal. The connection I^4 is preferably made through a motion-plate having a doubly-inclined slot and pin or roller therein, which permits the safety-bar to tilt to its highest and fall again to "normal" when said plate is moved the entire extent of its movement.

The operation is substantially as follows: Suppose that the main track A should be clear for the passage of trains, but the signal D, which pertains to said main track, be at "danger," as shown in Fig. 1, the lever H is moved, setting the signal to "safety." The movement of said lever H also operates the track-instrument, as described in my aforesaid accompanying application, Serial No. 209,306, so that neither lever H′ nor lever H^2 can be moved until a train has passed and operated said track-instrument. The safety-bar also prevents the switch from being unlocked at L until the train has passed off the safety-bar. The safety-bar and track-instrument being located directly opposite to one another, a train will first get on the safety-bar before the track-instrument can be operated, and will remain thereon until after said track-instrument has been passed. Said safety-bar being located beyond the fouling-point of the track A and siding B, the switch C cannot be moved until after the train has passed the fouling-point; hence after the main line has been cleared and the safety-signal given the switch cannot be moved until a train has passed not only over the switch, but beyond the fouling-point of the siding and main track. If it were not for the track-instrument, the switch might be moved before the train reached the safety-bar, and, therefore, before the train had passed beyond the fouling-point, and if it were not for the safety-bar the switch might be unlocked as soon as the track-instrument had been operated, as such instrument is operated by the first wheel of a train and while part of the train may be yet at a danger-point; but by arranging the safety-bar and track-instrument opposite to one another they affect each other, and both act on the interlocking apparatus in such manner that the switch cannot be either unlocked or moved until a train to which the right of way has been given, or for which the track has been cleared, has passed beyond the track-instrument, and also off of the safety-bar and beyond the fouling-point of the siding and main track—that is, completely out of the section controlled by the signal D; hence, no matter how many switches or danger-points there may be in the section of track to which the signal insures safety, such section is absolutely protected against movement of any of its switches or brakes until the train has completely passed off of such section.

While I prefer to employ a mechanical track-instrument as being more certain and reliable than an electrically-operated device for the same purpose, still my invention may be carried into effect by an electrical track-instrument, the condition being that the track-in-

strument and safety-bar both coact in the manner described.

I have shown and described a signal as a part of the combination embodying my invention and the connection I as a connection between the interlocking apparatus and said signal; but any other equivalent adjunct may be used instead of said signal, and be operated through the medium of said connection I. By "equivalent adjunct" is meant any device whose connection or movement sets the track-instrument and through the latter locks the interlocking apparatus.

I have shown and described my invention in connection with a switch having a switch-lock; but I do not wish to be understood as being limited thereto, as in lieu of a switch the interlocking apparatus may operate in conjunction with a crossing, a draw-bridge, or other danger-point of a road, and the switch-lock may in some cases be dispensed with.

What I claim as my invention is as follows:

1. The combination, with an interlocking apparatus and a signal or other connection, I, of a track-instrument which locks the interlocking apparatus when the signal or other connection is set for the passage of trains and is automatically unlocked by a passing train, and a safety-bar connected with said interlocking apparatus, said track-instrument and safety-bar coacting substantially in the manner described.

2. The combination, with an interlocking apparatus and a signal or other connection, I, of a track-instrument which locks the interlocking apparatus when the signal or other connection I is set to allow the passage of trains and is automatically unlocked by a passing train, and a safety-bar connected with said interlocking apparatus and preventing the movement of the connection to which it is attached when a wheel of the train is over it, said track-instrument and safety-bar being located opposite each other at the extreme or remote end of the section of track over which the signal or other adjunct allows the passage of trains, substantially as shown and described.

3. The combination, with a track and switch, of an interlocking apparatus, a signal, a safety-bar, a track-instrument, a switch-lock, and intermediate connections between said parts, the safety-bar being connected to the switch-lock connection and the track-instrument being connected to the signal-connection, whereby the switch is rendered immovable until a car or engine has passed both the track-instrument and safety-bar, substantially as set forth.

4. The combination, with an interlocking apparatus having two or more levers and connections therefrom, with parts movable thereby, of a track-instrument and a safety-bar controlling the movements of said connections and levers, whereby, after the track-instrument has been set for the passage of trains, the lever connected with the safety-bar cannot be moved until the track-instrument has been operated and effected a release or automatic unlocking and until the safety-bar has been entirely cleared, substantially as shown and described.

5. The combination of an interlocking apparatus, a safety-bar, a track-instrument, and intermediate connections between said parts, whereby, after the track-instrument has been set for the passage of a train, the safety-bar connections cannot be moved until a passing car or engine has operated the track-instrument and passed beyond the safety-bar, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 23d day of June, 1886.

FREDERICK S. GUERBER.

Witnesses:
WILLIAM HOWELL POWELL,
R. DALE SPARHAWK.