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W. J. GUSTIN.

RAILWAY SIGNAL.

APPLICATION FILED NOV. 21, 1906.

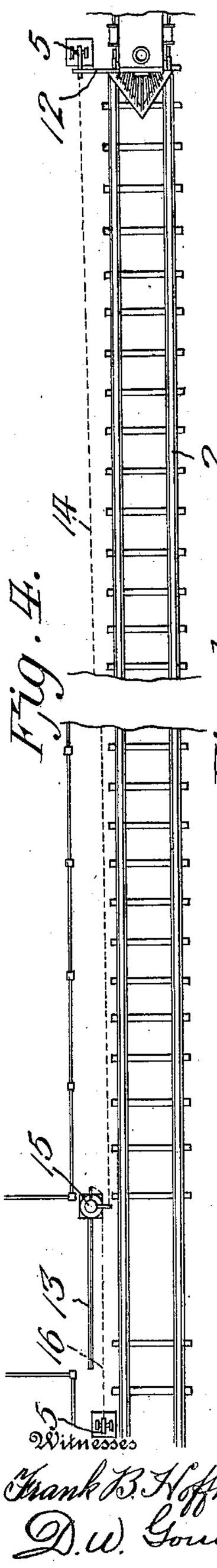

Fig. 4.

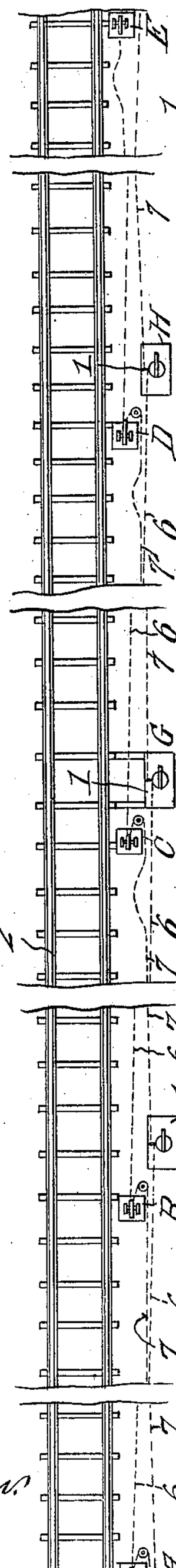

Fig. 1.

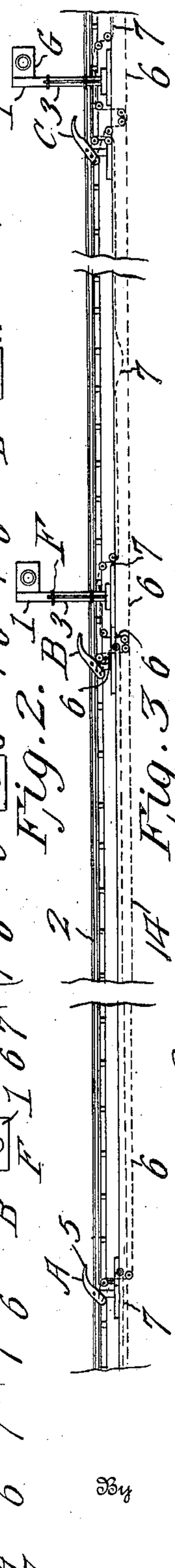

Fig. 2.

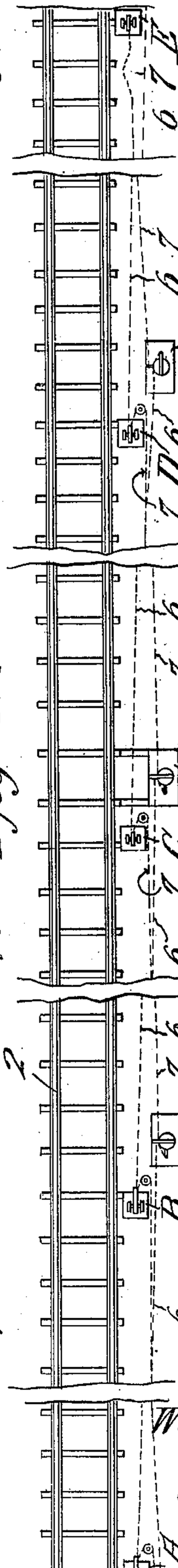

Fig. 3.

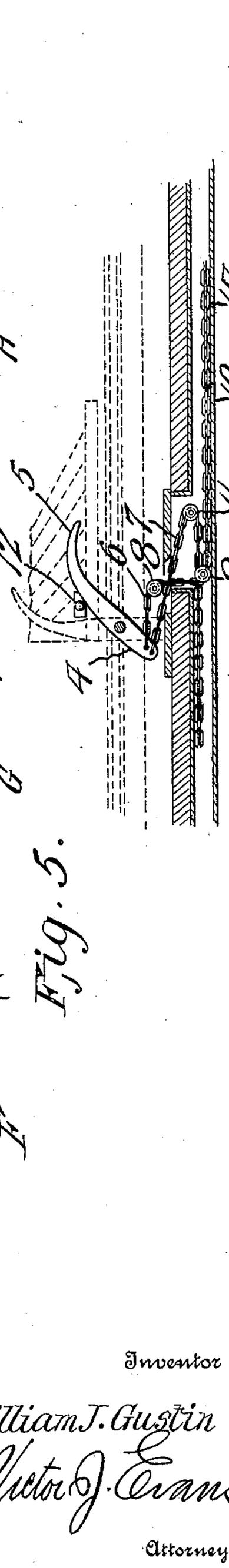

Fig. 5.

Witnesses

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RAILWAY-SIGNAL.

No. 861,027. Specification of Letters Patent. Patented July 23, 1907.

Application filed November 21, 1905. Serial No. 288,446.

To all whom it may concern:

Be it known that I, WILLIAM J. GUSTIN, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented new and useful Improvements in Railway-Signals, of which the following is a specification.

The invention relates to an improvement in railway signals and particularly to the block signal adapted to be automatically and successively operated during the passage of a train.

The main object of the present invention is the provision of means whereby the train during its travel will automatically operate the signal immediately in front of it and the signal immediately beyond it, so that the engineer of any particular train will be duly advised as to the presence of the train ahead of him at such a distance as to be enabled to control the movement of his own train.

The invention will be described in the following specification, reference being had particularly to the accompanying drawings, in which:—

Figure 1 is a plan illustrating the application of my invention, Fig. 2 a side elevation of a portion of the same, Fig. 3 a plan similar to Fig. 1 showing a portion of the signals operated, Fig. 4 a plan illustrating the application of the invention to a crossing gate, Fig. 5 is an enlarged sectional detail illustrating one of the levers and signal connections.

Referring to the drawings my invention in its preferred form is primarily adapted for the straight block system, being illustrated particularly in Fig. 1, 2 and 3. In said figures the signals 1 are shown as mounted at determinate distances, as for example each half mile along side of one of the rails of the track 2. The signals 1 may be of any preferred type though preferably having a revoluble standard 3 provided at the upper end with the usual semaphore or other signal proper.

Adjacent each of the signals, preferably slightly in rear thereof relative to the direction of travel of the train is arranged the operating mechanism comprising a lever 4 pivotally supported adjacent the track and having its upper free end 5 curved in the direction of travel of the train. The lower end of the lever is connected with the terminals of two flexible cables 6 and 7, the former passing around idlers 8 and 9 extending in a suitably arranged conduit 10 directly to the signal 1 located at the half block, or as noted above a half mile in advance of the lever, the connection of this cable being such that when the free end of the lever 5 is depressed, as hereinafter described, the signal 1 in front of and connected therewith is set at closed track. The cable 7 extends about an idler 11 and within the conduit 10 in a direction opposite to that of the cable 6 and is connected to the signal one-half mile or a half block in rear of the particular lever being operated, the latter connection being such that when said lever is depressed said signal holding the second train in rear is set at clear track.

It is to be understood that the levers 5 are arranged adjacent each of the signals, and that as described each lever when operated serves to close the signal a half mile in rear of its position and open the signal a half mile in front of it, each lever thereby controls two signals, so that as the train advances and operates the successive levers the signals in advance of the train are being continually and successively opened, while those in rear of the train are being continually and successively closed. The automatic operation occurring a half mile distant from the respective signals so that the track in rear of the train is closed against a second train until the first train is at least a half mile beyond the particular signal.

It will be noted that a block includes three signals, two end signals and a center signal, the blocks overlapping so that each signal forms the end of a block and also the center of a block, as will be obvious. The operating levers are arranged adjacent each signal, but are adapted to actuate only two signals forming the ends of that particular block in which the lever is centrally arranged.

The lever is actuated by a suitable laterally projecting arm 12 carried on the engine and adapted to contact with the lever above its pivot and serving to operate the lever to effectuate the operation described. It is, of course, understood that the operation of one lever to open the signal in rear will move the rearward lever connected with that signal to upright or normal position ready for operation by a succeeding train.

In Fig. 4 the invention is shown as applied to a crossing gate 13, a signal cable 14 projecting from the lever 5 arranged beyond the gate toward the approaching train being so connected to the pivot post 15 of the gate as to move said gate to closed position upon contact of the arm 12 of the engine with the lever 5. A second lever 5 is arranged beyond the gate in the direction of travel with a cable 16 so connected to the gate that on a depression of said second lever 5 the gate will be moved to open position, this movement of the gate drawing upon the lever 14 and restoring the lever 5 connected therewith to its normal position.

Referring particularly to Figs. 1, 2 and 3 of the drawings, wherein is shown a series of levers A, B, C, D and E and a series of signals F, G, and H, respectively connected in a manner previously described, the operation of my improved signal operating device is as follows: It will be noted that the cable 7 leading from any particular lever to the signal in rear of said levers is of such a length that when the lever is in normal or elevated position and the signal in inoperative

or clear position, a certain degree of looseness or slack is afforded in any such cable. This being understood I will assume a train entering the track on Fig. 1 and engaging the lever A. Disregarding the effect of said lever upon the signals in rear of it, the movement of the lever in the passing of the train will exert a pull upon the cable 6. This will swing the signal F to danger position, and the movement of said signal F will take up the slack in cable 7 leading to lever C. The train now advancing and engaging lever B will exert a pull upon the cable 6 leading to the signal G in advance of said lever, at the same time effecting rearward signals in a manner which will be presently explained. The movement of signal G to danger position will take up the slack in cable 7 leading to the lever D in advance of said signal G. The train still advancing and engaging lever C will cause said lever to exert a pull upon and set signal H, at the same time taking up slack in cable 7 leading from the signal to lever E. As the reverse connections from lever C are clearly shown I will describe the rearward effect of the movement of said lever, it being understood, of course, that a similar rearward effect is due to the operation of each lever. Upon the movement of lever C, therefore, the signal H is set to danger position by the pull upon the cable 6, while at the same time the pull upon the cable 7 leading from said lever C restores the signal F to normal or clear position. This movement of the signal F will, of course, reset the lever A to normal or elevated position through pull upon the cable 6 leading to said lever. This resetting movement of the lever A due to the operation of the lever C re-establishes the normal slack in the cable 7 leading from said lever A. This operation is continued throughout in the travel of the train, the operation of each lever affecting the signals directly in advance and in rear of it but not effecting the signal directly adjacent to it. The operation of the signals so affected also causes a resetting to normal position of the lever directly connected to such rearward signal, and the taking up of the slack in the cable leading from said forward signal to the lever connected thereto in advance thereof. Each lever, therefore, resets the second lever in rear thereof, resets the signal directly in rear thereof, and sets to danger position the signal in advance thereof, the movement of this signal being without effect upon the lever in advance of such signal owing to the normal slack provided in the connecting cable.

In the signal operating device described it is apparent that various signals throughout the length of the track are automatically and successively operated by the travel of the train, and that it is, therefore, impossible for a second train to approach any nearer than a predetermined distance to the preceding train without being warned of the presence of said train.

The device in its essential parts is exceedingly simple, requiring aside from the usual or preferred form of switch and stand only an operating lever or a series thereof and a sufficient length of cable, preferably chain, to connect the parts.

As constructed the device will require practically no attention and its few working parts guard against probability of disarrangement.

Having thus described the invention what I claim as new, is:—

1. A signaling device comprising a series of signals, a signal operating device arranged adjacent each of the signals and connected solely with the signals in advance and in rear of that signal adjacent which said device is positioned, the rear connection being of a length to permit operation of the rear signal without affecting the signal operating device connected thereto and in advance thereof.

2. A signaling device comprising a series of signals arranged at determinate points lengthwise of the track, a single signal operating device arranged adjacent each signal and adapted in operation to actuate the signals in front and rear of said device, the connection between the operating device and rear signal being of such length as to permit operation of said signal by the device arranged in rear thereof without affecting the device in advance of that signal.

3. A signaling device comprising a plurality of signals arranged at determinate points and normally at clear, a signal operating device arranged adjacent each signal and connected solely to the signals in front of and in rear of the signal adjacent which the device is positioned, the operation of a particular signal operating device serving to operate the respective signals connected thereto in reverse directions, said rearward signal being normally free from the influence of the operating device in advance thereof.

4. A signaling device comprising a plurality of signals arranged at determinate points and normally at clear, a signal operating device arranged adjacent each signal and connected solely to the signals in front of and in rear of the signal adjacent which the device is positioned, the operation of a particular signal operating device serving to operate the respective signals connected thereto in reverse directions, said rearward signal being normally free from the influence of the operating device in advance thereof, the operation of said rear signal by the device in rear of that signal serving to dispose said signal within the influence of the operating device in advance of that signal.

5. A signaling device comprising a series of signals arranged at determinate points lengthwise of the track, a signal operating device arranged adjacent each signal and directly connected to the signals in front and in rear of the signal adjacent which said device is positioned, the connection between the device and rear signal including an excess length of connection to provide for a movement of the rear signal under the influence of an operating device in rear of that signal without affecting the operating device in advance of that signal.

In testimony whereof, I affix my signature in presence of two witnesses.

WILLIAM J. GUSTIN.

Witnesses:
HOWARD M. STANTON,
LOUISE HAYNES.