

Jan. 17, 1928.

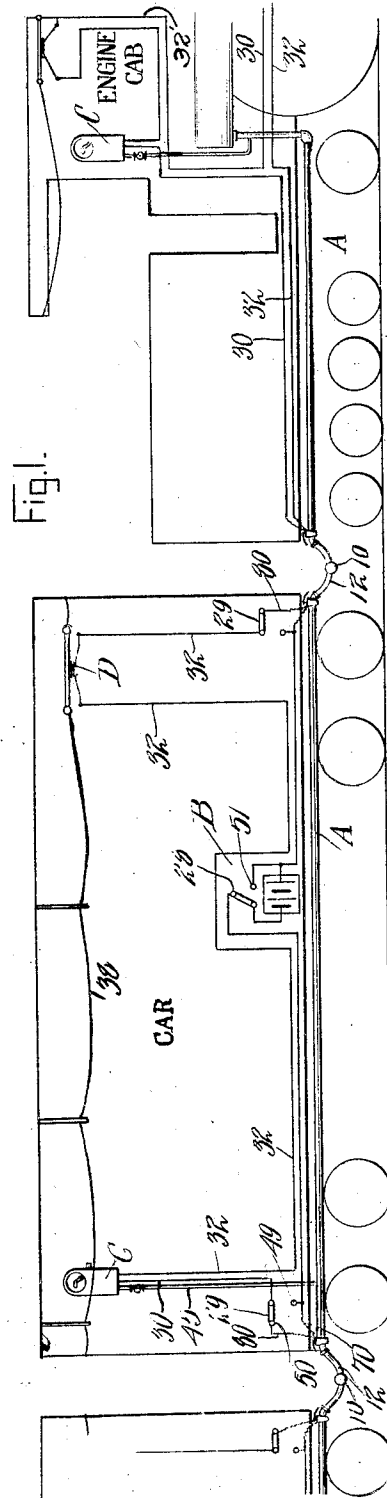
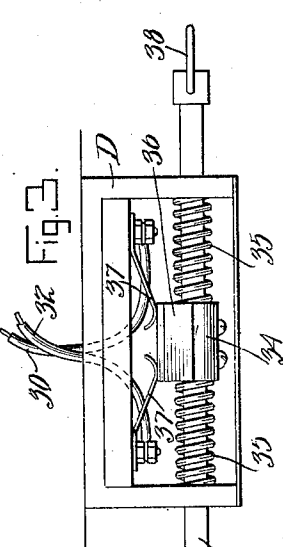
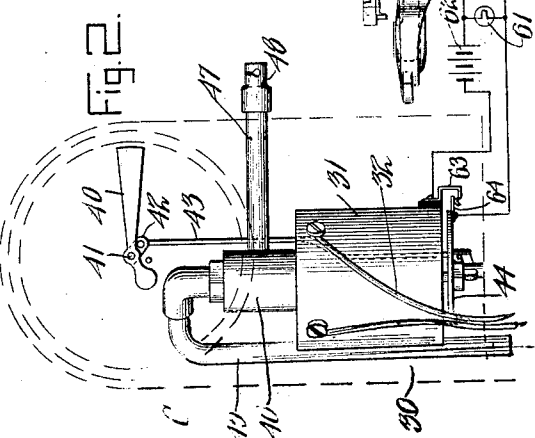
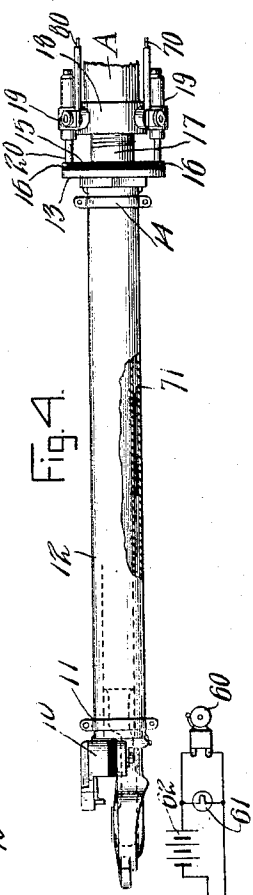
W. E. BENN ET AL

1,656,689

TRAIN SIGNAL SYSTEM

Filed May 10, 1920

2 Sheets-Sheet 1



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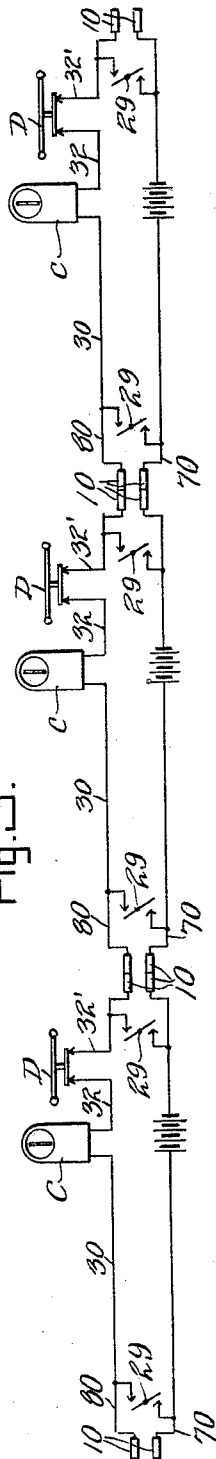
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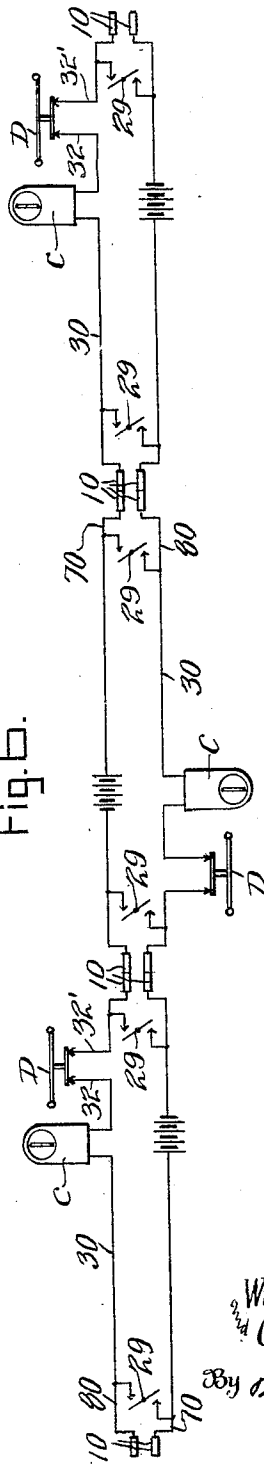
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2 Sheets-Sheet 2

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5. 19



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UNITED STATES PATENT OFFICE.

WILLIAM E. BENN AND GEORGE E. DAVIES, OF TROY, NEW YORK, ASSIGNORS TO THE UNITED STATES TRAIN SIGNAL COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

TRAIN-SIGNAL SYSTEM.

Application filed May 10, 1920. Serial No. 380,286.

Our said invention relates to signaling systems for railway trains whereby the train crew, including the engineer as well as the members of the crew on the cars, will be promptly advised of any break in the air line and also whereby any member of the train crew may readily signal to the engineer and at the same time sound a signal in any other part of the train. This particular invention consists in various improvements in the details of construction particularly of the coupling members and in the general association of parts whereby the results desired are accomplished, all as will be herein after more fully described and claimed.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is a diagrammatic view illustrating a portion of a railway train equipped with a signaling apparatus embodying our improved system and devices,

Figure 2 a detailed view on an enlarged scale showing the signaling apparatus used in the several cars of the train on an enlarged scale,

Figure 3 a detail view showing the signal controller on an enlarged scale,

Figure 4 a view of a section of the hose coupling showing the parts in assembled position, including one-half of the coupling and the section of flexible hose joining the same with the fixed end of the air line carried by the car,

Figure 5, a diagrammatic view illustrating three cars equipped with our improved signalling apparatus, and

Figure 6, a similar view with the center car reversed.

In said drawings, the portions marked A represent the fixed sections of the air line on the train; B a battery for supplying current to the electric circuit forming a part of the signaling system; C the signal box; and D the controller bracket or support.

The parts referred to will be described more particularly in the detailed description of the apparatus. The air line A is, or may be, of the usual or any approved type. The same is true of the battery B, while the signal boxes C and supports D are of any appropriate construction to contain and support the mechanism for which they are intended.

The hose coupling members 10 are of substantially the same construction as shown in the Benn Patent No. 1,166,407 December 28, 1915, and require no detailed description.

The wires 70 and 80 extend into the car, one extending back and connecting with the binding post 28 on battery B and the other to a switch 29 by which it is coupled to a branch wire 30 extending to the signal box and connecting with one side of a magnet 31. The other side of said magnet is connected to a branch wire 32, which constitutes the other side of the electrical circuit through the train, and is connected to one end of the reciprocating controller 33 in the circuit, another branch wire 32' connecting the other end of said controller to another switch 29 which connects with the wire 80 at the other end of the car, thus continuing the circuit through the train. It will be seen that the circuit is maintained regardless of the number of units in a train and that the cars, or any of them, may be coupled together either end toward the front without changing the polarity or flow of the current.

The reciprocating controller 33 is mounted in the bracket D which is appropriately located in the car. Said reciprocating controller consists of a bar having a block 34 rigidly secured midway between the ends of the bracket D and coiled springs 35 mounted between said block and said ends which normally hold said block 34 centrally between said ends. Said block 34 is formed in two parts separated by insulating material 36 and the wires 30 and 32 are connected to spring contact arms 37 which are adapted to normally rest upon the metal contact side of said block. The ends of the bar 33 are connected to a cord 38 running through the train, after the manner of the usual bell cord, by means of which a member of the train crew may operate said reciprocating bar in either direction to move block 34 out of contact with one of the arms 37 and break the circuit and set or sound the signal i. e. the controller acts equally in opposite directions, or is double acting. Immediately on releasing the force applied through the medium of the bell cord, the springs 35 will return block 34 to normal position and re-establish the contact and the circuit.

The signal boxes C are set in the cars and in the cab of the engine in any appropriate

position. A signal arm 40 is mounted on an arbor 41 therein which is adapted to be operated by a crank arm 42 mounted on said arbor and connected by a connecting rod 43 with a lever operated by armature 44 of the magnet 31. A branch 45 from the air line connects with a valve casing 46 on the top of magnet 31 and a branch 47 runs from the other side of the valve therein and has an alarm sounding device 48 on its outer end. Said alarm sounding device may, as may be readily understood, be of any type desired—either a whistle or a device adapted to emit a “sissing” sound similar to the sound produced by the escape of air in the present air-brake apparatus. It may also be a bell, as 60, or a light as 61, operated by a battery 62 connected in circuit by contact of contact point 63 mounted on magnet 31 but insulated therefrom with contact 64 carried on armature 44, as indicated in Figure 2. Any other type of alarm found desirable or appropriate may be used, as preferred. We prefer, however, and believe to be the most practical, a whistle in the cab and what we have denominated a “sisser” in the cars throughout the train. By “sisser” is meant a device adapted to produce a hissing sound as the air escapes therethrough.

The details of construction of the signal box and likewise of the controller form the subject matter of separate applications 380,151 and 380,287 filed concurrently herewith and therefore need not be more fully described herein.

In operation a train being equipped with this apparatus the electrical circuit is closed at the end of the rear car by means of the switch 29 which is turned to connect with the post 49 instead of with the post 50 as illustrated in Figure 1.

Should the battery B of any car become disabled from any cause at any time, the switch 28 can be turned to contact with the post 51, thus connecting the signaling system of this car into the circuit supplied by batteries through the other cars and thus guard against the signaling system of any car becoming disabled by reason of the battery of any one car running down or becoming exhausted.

The parts being in the position shown in Figure 1, it will be readily understood that upon breaking the circuit by disconnecting the air line coupling, the magnet 31 will become de-energized, the armature 44 fall causing the signal arm 40 to turn to danger position as indicated by the dotted lines in Figure 2 and at the same time open the

valve in casing 46 permitting an inrush of air through pipe 45 and an outrush through pipe 47 and the alarm sounding device 48. Or, when the signals 60 and 61 are used they will be cut into circuit through battery 62 and set into operation. The same result is achieved by moving controller 33 through the medium of the operating cord 38, as will be readily understood.

By such means, therefore, both an audible and a visible signal (of various types) are operated automatically, either by a movement of the controller 33 or by any break in the air line coupling as will be readily seen.

It will be evident to those skilled in the art that operation of the device does not depend solely on manual control, since separation of the air line due to parting of the train, or a grounded wire, or breaking of the circuit due to any other cause will at once operate the signals. It will also be evident that various modifications of the system and its elements may readily be made by those skilled in the art, and therefore I do not limit myself to what is shown in the drawings and described in the specification, the true scope of the invention being set forth in the appended claims.

Having thus fully described our said invention, what we claim as new and desire to secure by Letters Patent, is:

1. In a train signaling system, a circuit including a signal control means extending through a series of train units, batteries connected in the circuit on the respective units, signals controlled by said means, and connections between the train units whereby either end of any unit may be connected to either end of any other unit without causing the batteries to act in opposition to each other, substantially as set forth.

2. In a train signaling system, audible and visible signals on each of a plurality of train units, connections from the train air line to the audible signals, common electromagnetic means tending to operate the visible signal and to release the air to the audible signal, a normally closed electric circuit holding said means out of action, and manual means on said train units for breaking the circuit, substantially as set forth.

In witness whereof, we have hereunto set our hands at Washington, District of Columbia, this fifth day of April, A. D. nineteen hundred and twenty.

WILLIAM E. BENN.
GEORGE E. DAVIES.