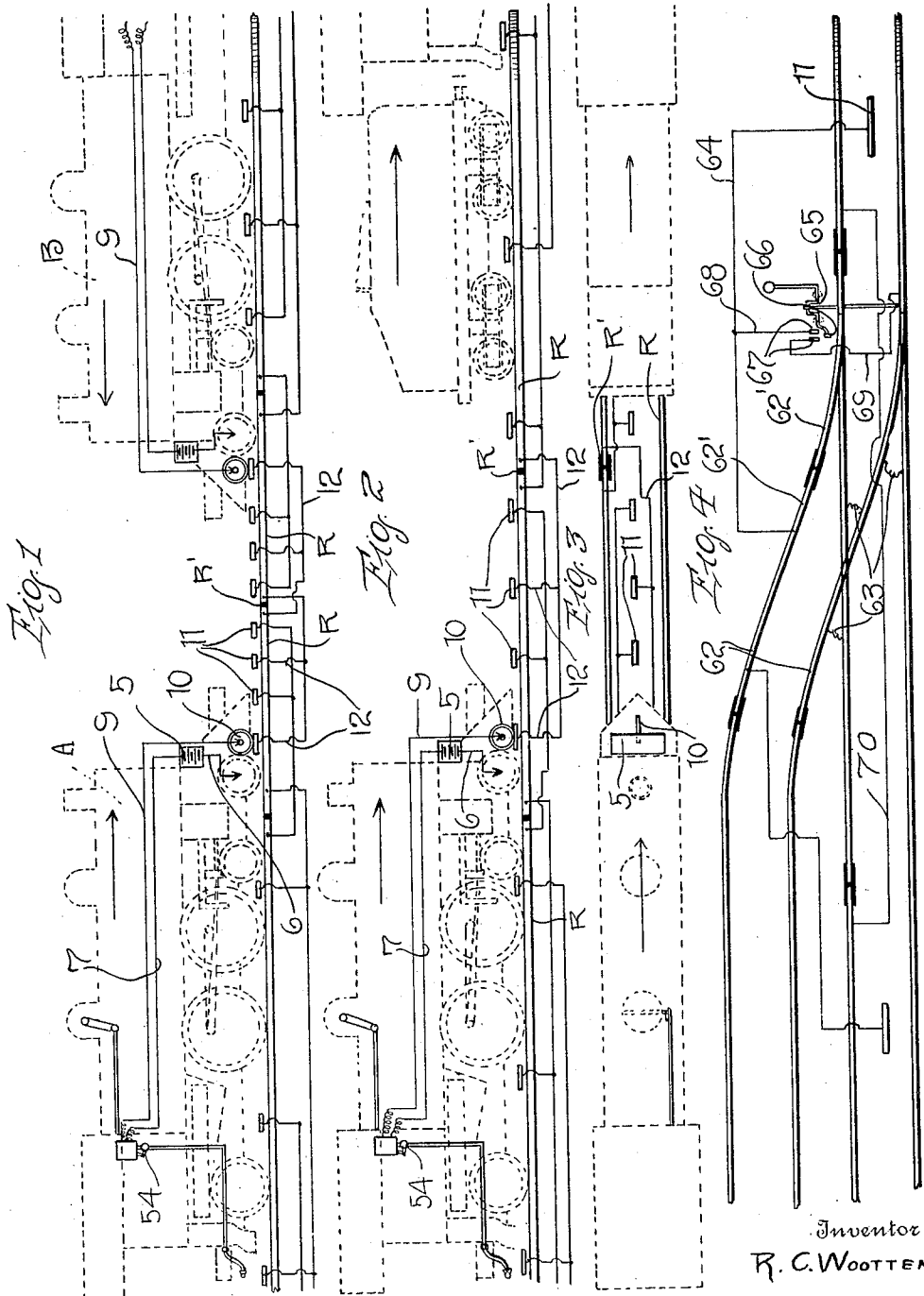


R. C. WOOTTEN.
 AUTOMATIC STOP DEVICE.
 APPLICATION FILED SEPT. 2, 1913.

Patented July 7, 1914.
 2 SHEETS—SHEET 1.

1,102,707.



Witnesses
 Robert M. Sutphen.
 V. J. Nowick.

By *Watson E. Coleman*
 Attorney

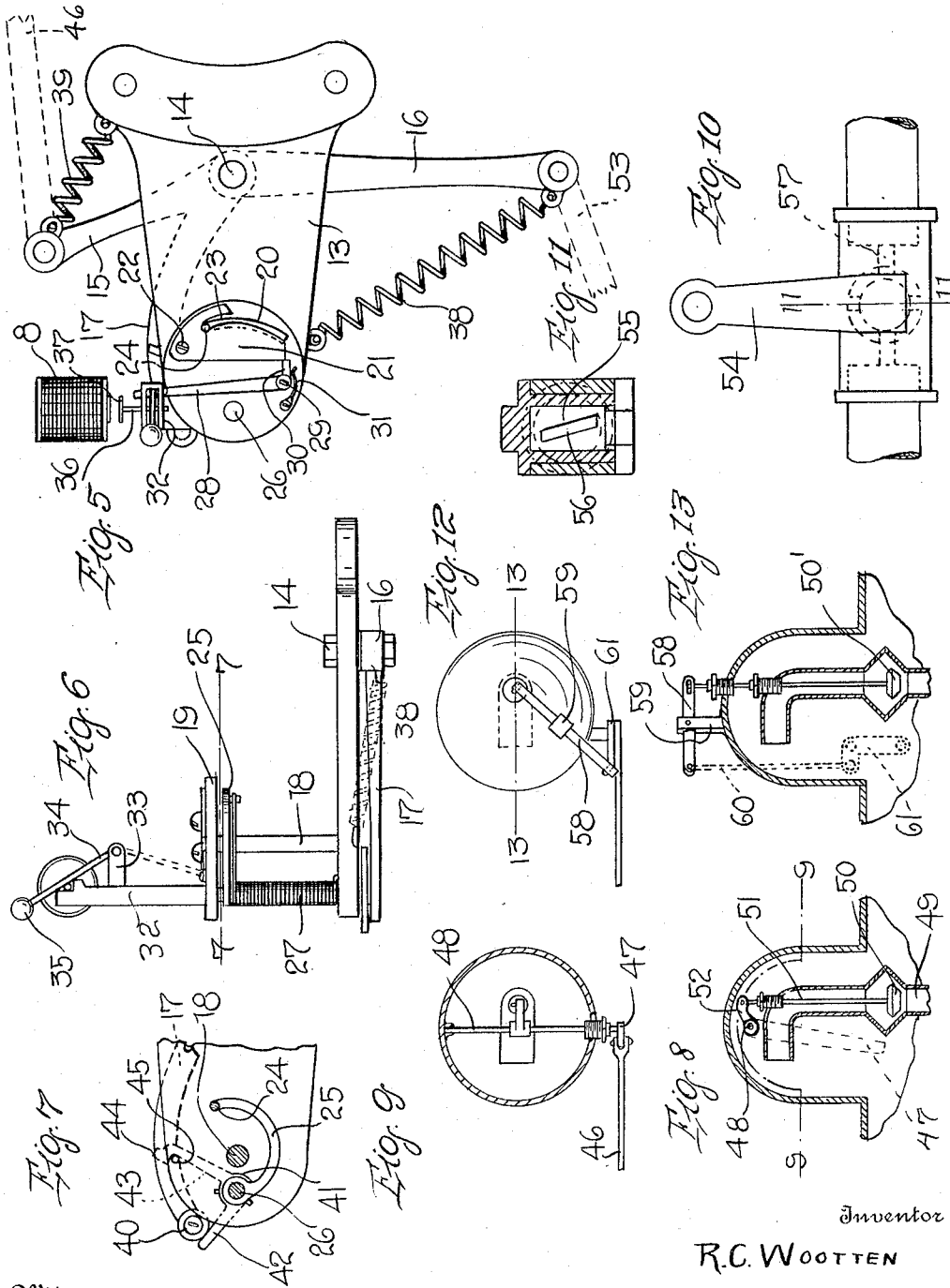
Inventor
 R. C. WOOTTEN

R. C. WOOTTEN.
AUTOMATIC STOP DEVICE.
APPLICATION FILED SEPT. 2, 1913.

1,102,707.

Patented July 7, 1914.

2 SHEETS-SHEET 2.



Witnesses
Robert M. Sutphen.
V. J. Howick.

Inventor

R. C. WOOTTEN

334

Watson E. Coleman
Attorney

UNITED STATES PATENT OFFICE.

ROBERT C. WOOTTEN, OF DANVILLE, VIRGINIA.

AUTOMATIC STOP DEVICE.

1,102,707.

Specification of Letters Patent.

Patented July 7, 1914.

Application filed September 2, 1913. Serial No. 787,769.

To all whom it may concern:

Be it known that I, ROBERT C. WOOTTEN, a citizen of the United States, residing at Danville, in the county of Pittsylvania and State of Virginia, have invented certain new and useful Improvements in Automatic Stop Devices, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to automatic stop devices for railroad block signaling systems and has for its primary object to provide simple and efficient electrically controlled means for automatically cutting off the supply of steam to the engine of a locomotive and simultaneously releasing the air so that the brakes are applied.

My invention has for another of its objects to provide simple, inexpensive, and durable means primarily controlled and actuated by an electromagnet in the cab of the locomotive, whereby head on and rear end collisions may be averted, as well as all danger of a train running into an open switch or side swiping a train on the switch rails.

The invention has for another and more specific object the provision of a compound lever connected to a steam supply controlling valve in the dome of the locomotive boiler and to an air release valve, springs for actuating said lever to operate the valves, a trip device to hold said lever against operation by the springs, and an electromagnet for actuating the trip device to release said lever.

With the above and other objects in view, as will become apparent as the description proceeds, the invention consists in certain constructions, combination, and arrangements of the parts that I shall hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which,

Figure 1 is a diagrammatic view illustrating the operating circuit and showing two locomotives in dotted outline approaching each other upon the same track; Fig. 2 is a similar view showing two trains traveling in the same direction; Fig. 3 is a top plan view of a section of the track; Fig. 4 is a similar view, illustrating the circuit connections at a switch; Fig. 5 is an enlarged plan view of the steam and air valve operat-

ing lever and associated parts; Fig. 6 is a side elevation thereof; Fig. 7 is a detail section taken on the line 7—7 of Fig. 6; Fig. 8 is a detail section through the dome of the boiler showing the steam cut off valve; Fig. 9 is a section taken on the line 9—9 of Fig. 8; Fig. 10 is an enlarged detail view of the air release valve; Fig. 11 is a section taken on the line 11—11 of Fig. 10; Fig. 12 is a top plan view of the boiler dome showing a slightly modified means of connection between the valve stem and the operating lever. Fig. 13 is a section taken on the line 13—13 of Fig. 12.

Referring in detail to the drawings, and more particularly to Figs. 1 and 2 thereof, A and B illustrate two locomotives traveling in opposite directions or toward each other upon the same track. One of the track rails is divided into blocks or sections, indicated at R, said rail sections being joined by the insulating blocks R' in the usual manner. Each of the locomotives carries an electric battery 5, the same preferably being mounted upon the pony pilot. One terminal of the battery is connected by a wire 6 to the front axle of the forward truck, as clearly shown in the drawing. The other battery terminal is connected by the wire 7 to an electromagnet 8 arranged in the cab of the locomotive. A wire 9 extends from the electromagnet 8 to a revoluble wheel or shoe 10, suitably mounted in advance of the front truck wheels. This shoe is adapted to engage with a series of contact rails or blocks 11 which are centrally arranged between the track rails and above the plane thereof. These contact rails may be disposed at any desired distance apart and the alternate contact rails are connected by means of the wires 12 to the adjacent rail blocks or sections R of the track. In other words, as shown in Fig. 1, four of the contact rails 11 are disposed above one of the block sections R. One pair of these contact rails are connected to the next block section R in advance of the train or locomotive A, while the other pair of contact rails are connected to the block section rearwardly of the forward end of the locomotive.

Referring now to Sheet 2 of the drawings, 13 designates a bracket plate which is mounted in a suitable box or housing and upon this plate a lever is fulcrumed, as indicated at 14. This lever is provided with

three arms, designated by the numerals 15, 16 and 17, respectively. To one end of the bracket 13 a post or standard 18 is fixed, and upon said post the disk 19 is secured. This disk is provided adjacent its periphery with an arcuate shaped slot 20 and upon said disk beyond one end of the slot 20 the latch plate 21 is fulcrumed, as at 22. This which is adapted to receive the pin or stud 24 fixed in the end of the curved arm 25. This arm at its other end is secured upon the shaft 26 which is rotatably mounted at its end in the bracket plate 13 and the disk 19 respectively. A heavy coil spring 27 is arranged upon the shaft 26 and has one of its ends connected to the end of the arm 25 which is provided with the stud 24. The other end of this spring is engaged with or secured to the bracket plate 13. Upon the face of the disk 19 wherein the latch plate 21 is mounted, a trip lever 28 is fulcrumed, as at 29, and is provided with an angular end 30 for engagement with the end of the latch plate 21 to hold said plate against pivotal movement. A leaf spring 31 on the disk 19 bears at its free end against the extension 30 of the lever and yieldingly holds the same in engagement with the latch plate. An arm 32 is fixed at one of its ends upon the disk 19 and is provided with spaced ears 33 between which one end of a trip rod 34 is pivotally mounted. The other end of this rod is provided with a weight 35.

36 designates a bolt or pin fixed to or integrally formed with an armature plate 37. This pin is mounted in the arm 32 and is adapted to support the trigger rod 34 in an elevated position, as shown in Fig. 6 of the drawings. The armature plate 37 is of course opposed to the core of the electromagnet 8.

A coil spring 38 is connected at one of its ends to the bracket 13 and has its other end attached to the arm 16 of the lever. A similar spring 39 is connected to the other lever arm 15 and to the bracket plate. The arm 17 of the lever has a roller 40 mounted upon its end which is engaged by one of the arms 42 of the member 41 which is fixed upon the shaft 26. The other arm 43 of this member is provided upon its end with a shoulder 44 which is adapted to engage a lug or pin 45, secured to the arm 17. The arm 42 bearing against the roller 40 materially assists in effecting a quick movement of the compound lever member when said lever is released by the actuation of the trip device. The arm 15 of the lever is connected by means of a rod 46 to the arm 47 secured to one end of a rock shaft 48 mounted in the dome of the locomotive boiler.

49 designates the conducting pipe which receives the steam from the boiler dome and

conducts the same to the steam chest of the locomotive engine. The valve 50 is arranged in said pipe and provided with a stem 51 to which the rock shaft 48 is connected through the medium of the arm 52 fixed upon said shaft. The other arm 16 of the operating lever is connected by means of a rod 53 to the arm 54 of the air release valve. The valve member 55 is mounted in a suitable casing arranged in the air line pipe and is provided with an obliquely disposed transverse port 56 which is adapted to traverse the vertical ports 57 provided at diametrically opposite points in the casing of the valve, when the arm 54 is actuated. It will be readily apparent that by providing the obliquely disposed port 56 in the rotary valve member, the release of the air from the air line pipe will be gradual. Thus the brakes will be applied and the train brought to a stop.

In Figs. 12 and 13 of the drawings, I have shown a slightly modified means for operating the steam cut off valve which embodies the lever 58 fulcrumed intermediate of its ends upon a standard 59 secured to the dome of the locomotive boiler. One end of this lever is connected to the stem of the cut off valve 50' while the other end thereof is connected by means of a rod 60 to one arm of a bell crank lever 61 fulcrumed upon the boiler dome. The other arm of this lever is connected to the arm 15 of the electrically controlled operating lever.

In Fig. 1 of the drawings, the two locomotives are illustrated approaching each other as in a head on collision, and in Fig. 2, the locomotives are traveling in the same direction as in a rear end collision. The operating circuit is precisely the same in each instance and it is, therefore, understood that the following description applies with equal force to both illustrations: Assuming that the locomotives A and B have moved into adjacent blocks, and the shoes 10 have been engaged with one of the contact rails 11 that are disposed above each block, the circuit is closed as follows: from the battery 5 through the shoe 10 of the locomotive A, wire 12 to the next adjacent block rail R in which the engine B is traveling, from said block rail R through the pony truck axle of locomotive B and thence to opposite rail and through said opposite rail back to locomotive A, whence the current flows to the pony truck axle of locomotive A, wire 6, battery 5, wire 7, electromagnet 8 and wire 9 back again to the shoe 10. Thus it will be seen that the circuit is closed through the battery and electromagnet carried by the approaching locomotive A and the magnet 8 will thus become energized, whereupon the armatures 37 will be attracted and the pins 36 moved to release the trigger rods 34. These rods swing downwardly by gravity

into engagement with the respective levers 28, thereby releasing the latch plates 21. It will be understood that the end 30 of the lever 28 bearing against the latch plate 21, which in turn engages the pin 24 on the arm 25 fixed to the shaft 26, holds said shaft against rotation under the action of the spring 27, as clearly shown in Fig. 5 of the drawings. The spring 27 acts in conjunction with the arm 42 bearing against the roller on the end of the lever arm 17 and also in conjunction with the spring 39, to actuate the compound lever. The arms 15 and 16 of said lever immediately act through the connections above described to close the steam cut off valve 50 and open the air release valve 55. The supply of steam for the operation of the engine is cut off and the application of the brakes in each locomotive simultaneously effected so that both trains are immediately brought to a stop without requiring any manual operation whatever.

In Fig. 4 of the drawings, I have shown the circuit used at a siding, wherein 62 indicates the switch rails. One of these switch rails is constructed of block sections 62', while the other switch rail consists of a single section suitably insulated from the main siding rail. This latter switch rail is wired, as indicated at 63 to the main line track rails. Assuming that a locomotive is approaching a closed switch when the shoe 10 of such locomotive comes in contact with the contact rail 11, the circuit is closed through wire 64, wire 68 to the switch stand contacts 67. The switch bar 65 being moved to open the switch, will move the movable contact 66 between the stationary contacts 67, thereby connecting the wire 69 to the main rail and back to the truck axle of the locomotive. From the axle, the current will flow through the wire 6 to the battery 5, wire 7 to the electromagnet 8 and wire 9, thereby completing the circuit. To prevent side swiping on a siding, should a locomotive approach a siding with another locomotive or train on the siding not "in the clear" the approaching locomotive when its shoe 10 makes contact with one of the contact rails 11 which is connected to the wire 64 the contacts 66 would be disconnected. Hence, the current would flow through the wire 64 around the switch stand to the switch rail 62, through the truck axle of the locomotive or car on the siding and thence to the opposite switch rail 62, wire 63 and back through the main line switch rail to the truck axle of the approaching locomotive, where it would finally flow through the truck axle wire 6, battery 5, wire 7, electromagnet 8 and wire 9, thereby completing the circuit with the result that the stop motion mechanism of the approaching locomotive would be brought into action and the steam line automatically shut off and the air brakes au-

tomatically applied, thus bringing the approaching locomotive to a stand-still before it passes into the switch.

From the foregoing, the construction and manner of operation of my invention will be clearly and fully understood. By means of the same, trains may be stopped at any desired distance apart and serious accidents thus averted.

It is to be understood that while I have shown and described the specific construction of the steam cut off and air release valves, I do not propose to limit myself thereto, as other valve constructions now in common use may be substituted if desired. The invention is also susceptible of a great many other modifications in the form, proportions and arrangement of the several parts employed and I therefore reserve the right to resort to all such legitimate changes as may be fairly embodied within the spirit and scope of the invention, as claimed.

Having thus described this invention, what is claimed, is:

1. In an automatic train stop device, the combination with the steam cut off and air release valves, of a lever having a pair of arms connected to the respective valves, a spring controlled arm, means movable with said arm to hold the lever against movement, a latch plate to hold said spring controlled arm against movement under the action of the spring, a lever to engage the latch plate and hold the same against movement, a gravity movable trigger to engage said lever, and release the latch plate, means for supporting the trigger against gravity movement, an electromagnet adapted to actuate said supporting means when the magnet is energized to release the trigger for gravity movement, and means for operating said first named lever when the spring controlled arm is released by the latch plate, whereby the steam cut off valve and the air release valve are simultaneously operated.

2. In an automatic train stop device, the combination with the steam cut off and air release valves, of a lever fulcrumed intermediate of its ends, connections between the opposite ends of said lever and the respective valves, said lever being provided with an arm, a spring actuated rock shaft, a stud on the lever arm, means on the rock shaft to engage said stud and hold the lever against movement, means for holding said shaft against rocking movement and its spring under tension, said means including a lever, a gravity movable trigger member to engage said lever, an armature, a pin fixed to the armature to support the trigger against gravity movement, an electromagnet to attract said armature, an electric circuit for said magnet, and means to actuate said lever when the same is released, where-

by the steam cut off and air release valves are simultaneously operated.

3. In an automatic train stop device, the combination with the steam cut off and air
5 release valves, of a lever fulcrum intermediate of its ends, connections between the opposite ends of said lever and the respective valves, said lever being provided with an arm, a shaft, a spring on said shaft, an
10 arm fixed to the shaft, a stud on said last named arm, a pivoted latch plate to engage said stud and hold the spring under tension, a lever to engage the latch plate, a member fixed upon the shaft, a stud on the lever
15 arm engaged by said member whereby the first named lever is held against movement, means for actuating said second named lever to release the latch plate, an electromagnet to actuate the lever releasing means,
20 a circuit therefor, and a spring to actuate said first named lever when the same is released, whereby the steam cut off and air release valves are simultaneously operated.

4. In an automatic train stop device, the
25 combination with the steam cut off and air release valves, of a lever fulcrumed intermediate of its ends, connections between

the opposite ends of said lever and the respective valves, springs connected to the opposite ends of the lever to actuate the same, 30 said lever being provided with an arm, a spring actuated arm, a stud carried thereby, a latch plate provided with a recess to receive said stud, a lever to engage said latch plate and hold the same against move- 35 ment, a stud on the lever arm, a member operable with said spring controlled arm adapted to engage said stud and hold the first named lever against movement, a gravity movable trigger to actuate the second 40 named lever and release the latch plate, an electromagnet, an armature therefor, a pin fixed to the armature to support said trigger against gravity movement, and an electric circuit for said magnet, whereby the 45 first named lever is released when said magnet is energized and the steam cut off and air release valves simultaneously operated.

In testimony whereof I hereunto affix my signature in the presence of two witnesses. 50

ROBERT C. WOOTTEN.

Witnesses:

A. J. DAVIS,

W. S. MITCHELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."