

1,047,704.

G. H. RICE.  
 TRACK ATTACHMENT FOR SWITCH SIGNALS.  
 APPLICATION FILED JUNE 12, 1912.

Patented Dec. 17, 1912.

2 SHEETS-SHEET 1.

Fig. 1.

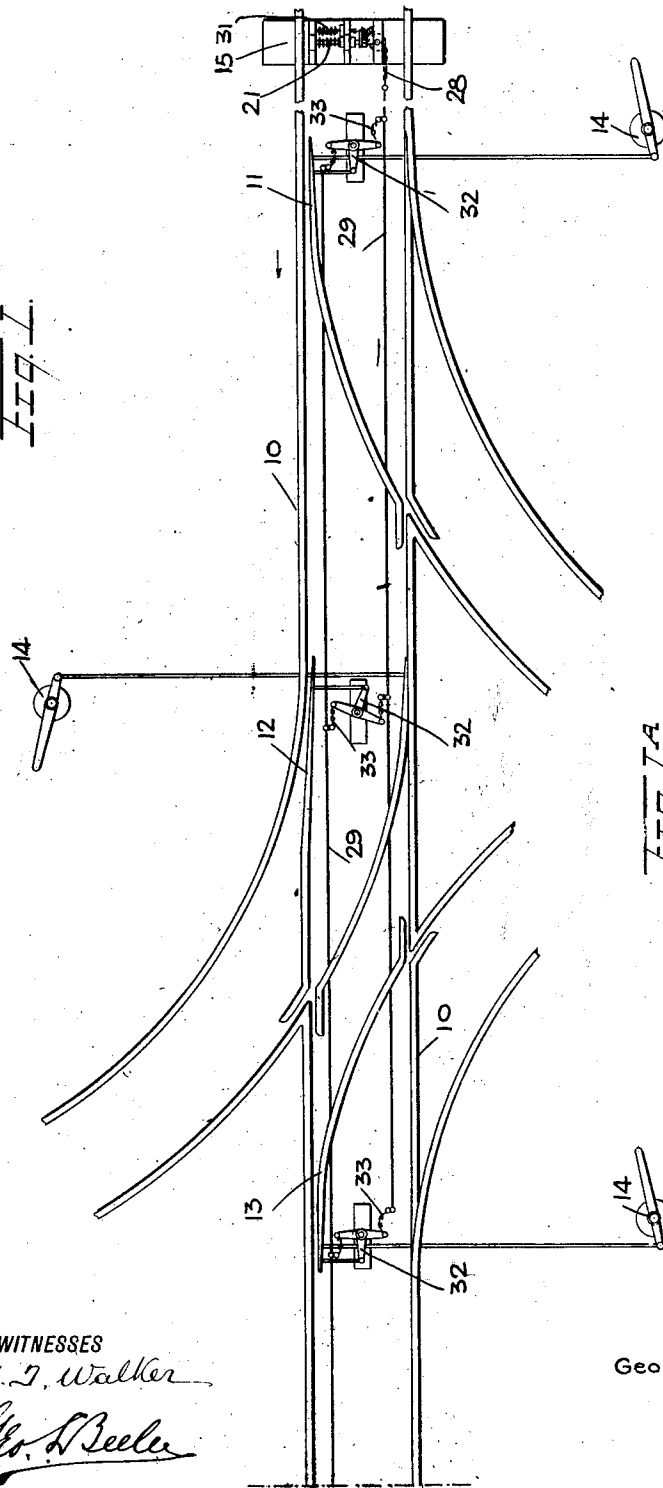
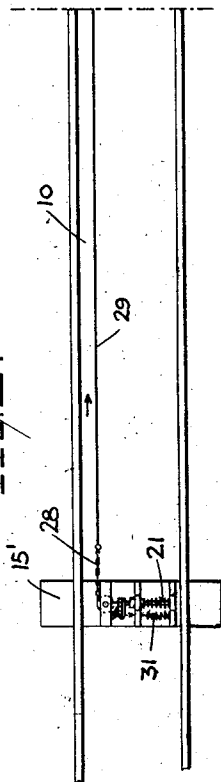


Fig. 2.



WITNESSES

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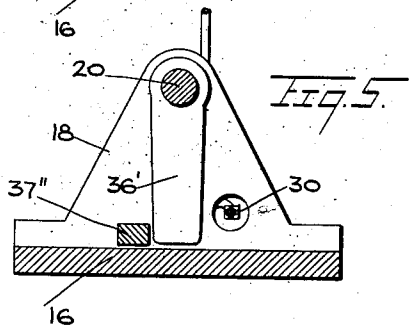
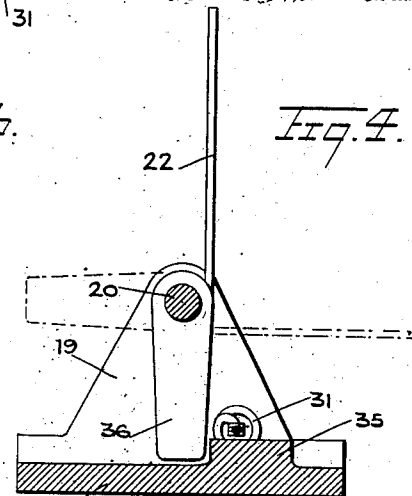
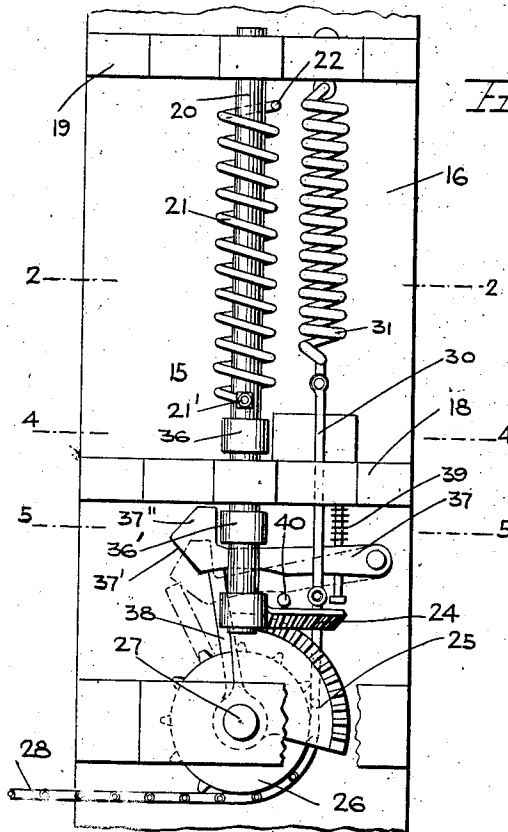
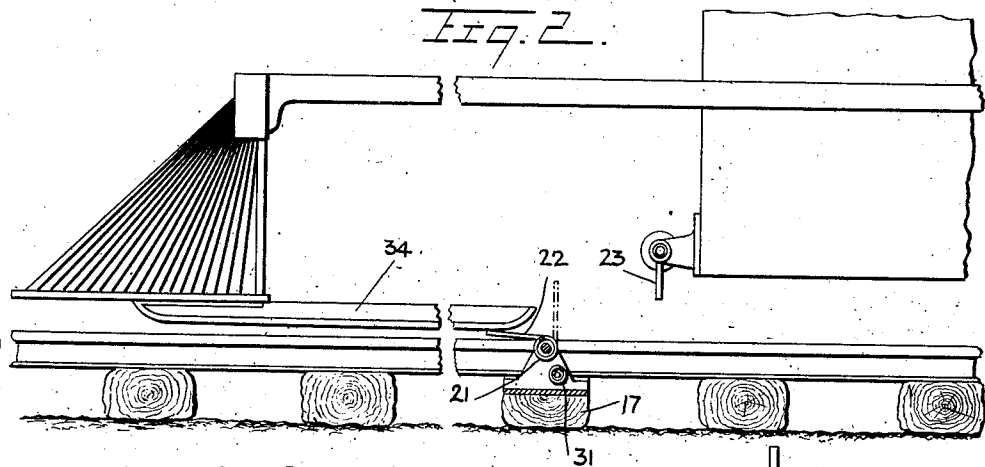
ATTORNEYS

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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

GEORGE HENRY RICE, OF HONOLULU, TERRITORY OF HAWAII.

## TRACK ATTACHMENT FOR SWITCH-SIGNALS.

1,047,704.

Specification of Letters Patent.

Patented Dec. 17, 1912.

Application filed June 12, 1912. Serial No. 703,155.

*To all whom it may concern:*

Be it known that I, GEORGE H. RICE, a citizen of the United States, and a resident of Honolulu, in the county of Honolulu and Territory of Hawaii, have invented a new and Improved Track Attachment for Switch-Signals, of which the following is a full, clear, and exact description.

This invention relates to safety appliances for railways, and has particular reference to devices for signaling or giving indication to the locomotive engineer of the fact of an open switch, draw or the like, which would be a menace to the train approaching the same.

The object of the invention more definitely stated is to provide a signaling device which may be connected for operation to any number of associated switches whereby, when any one of said switches is open, the signaling means will be positioned to give the proper indication to the engine driver. The arrangement, however, is such that when the signaling means have been operated simultaneously with the opening of the switch, the operation of any other switch will not be prevented, nor will the signaling means be restored to normal or inactive position until all the switches be again closed.

The foregoing and other objects of the invention will be hereinafter fully described and claimed and illustrated in the drawings accompanying this specification in which like characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a diagrammatic plan view of a section of railway track of a single track system, having associated therewith a series of switches; Fig. 1<sup>A</sup> will be understood as being an extension at the left hand end of Fig. 1; Fig. 2 is a side elevation of a fragment of a locomotive on a railway track, certain of the signaling means being shown in transverse section, on the line 2—2 of Fig. 3; Fig. 3 is a plan view of the mechanism at a signal station; and Figs. 4 and 5 are transverse vertical sections of the same respectively on the lines 4—4 and 5—5 of Fig. 3.

Referring particularly to the drawings the numeral 10 will be understood to indicate the main line of a single track railway, and associated with the same are a series of switches 11, 12 and 13, the exact number, however, of switches being immaterial. The switches and means for operating the same

may be of any usual or approved construction and operation, it being sufficient to indicate at 14 a diagrammatic representation of a block for each of said switches.

At 15 is indicated what may be regarded for convenience as a signal station, the same to be located along the track 10 at any predetermined distance from the switch 11, such distance being sufficient to warn the engineer in ample time to either stop his train or bring it under complete control by the time he reaches any one of the series of switches between which and the signal station operative connections are made. Likewise there is shown at 15' a similar signal station guarding the approach to the switch 13 or any others which may be taken from the main line by the train running in the opposite direction.

The devices at the signal station 15 comprise a base plate 16 adapted to be supported in any convenient manner adjacent one of the cross ties 17, either being connected to the tie or to the rails. Mounted upon and extending upwardly from the base plate 16 are a pair of standards 18 and 19 in which is journaled a transverse horizontal shaft 20. Said shaft is adapted to be rotated through an angle of substantially ninety degrees and has connected to it an actuator 21 shown in the form of a spiral spring encircling the shaft between the standards 18 and 19 and connected rigidly thereto at one end, as shown at 21'. The opposite end of the actuator is formed into a straight portion or finger 22 which is adapted in one position of the shaft to extend vertically as indicated in Figs. 3 and 4 and in the other extreme position of the shaft is adapted to lie substantially horizontal as indicated in dotted lines in Fig. 4. Said finger, when in its elevated position, is adapted to be struck by a movable member 23 carried upon any suitable portion of the locomotive and through the movement of which any suitable audible or visible signal may be given to the engineer. For such movable device carried by the locomotive, however, I prefer to use or recommend the mechanism constituting the subject matter of my previous Patent No. 1,002,083, dated August 29, 1911. It will be understood, of course, that the upright position of the finger 22 will be assumed only when there is at least one open switch toward which the engineer is running. The signal set in operation by such

finger, therefore, will warn the engineer of the dangerous fact just referred to. As a matter of fact, the movable member 23 may be the movable member of an automatic air brake mechanism, whereby when the said member is moved from its normal position through engagement with the finger 22, the brakes may be automatically set to stop or retard the running of the train whether or not the engineer should regard the signal.

Any suitable means may be employed to rotate the shaft 20 and determine the position of the finger 22 with respect to the position of the switches. As a preferred means for carrying this into practical operation, I connect to one end of the shaft a segmental gear 24 adapted to mesh with a corresponding gear 25 rigidly connected to a rotary member shown as a sprocket wheel 26 journaled on a vertical pivot 27 and connected to the base plate 16. A sprocket chain 28 passes over said sprocket wheel, one end of which chain is connected to the adjacent end of a bar 29 extending along the track and adjacent any desired number of said switches. The other end of the chain is connected through a link 30 to one end of a tension member in the form of a spring 31 whose opposite end is anchored to any fixed part of the structure, as for instance, the support 19.

Adjacent each switch and so connected with the movable switch points as to be thereby operated when the switch is thrown in either direction is a bell crank 32, the connection with the movable switch points being with the longitudinal arm of the bell crank. The normal position of the bell cranks 32, or the position corresponding to the closed switches, is such that the longitudinal arm aforesaid lies parallel with the track rails. The horizontal arm of each bell crank is connected by a flexible connection 33 to the adjacent bar 29. By virtue of the spring 31 acting through the chain 28, the normal position of the finger 22 is that indicated in Fig. 4 in dotted lines, and the effect on the bar 29 is such that all of the flexible connections 33 will be under tension or without slack. Referring to Fig. 1 it will be noted that the switch 12 is open, and hence the bell crank associated therewith is shown rotated which has resulted in the movement of the bar 29 toward the left, causing all of the other flexible connections 33 of the other switches in the series to become slackened. Such draft upon the bar 29, due to the rotation of the bell crank at the switch 12, will result in the movement of the actuator and associated parts to the position shown in Fig. 3. Any other switch of the associated series may then be moved, if necessary or desirable, without affecting the position of the signal operating devices.

The finger 22, by the above operation,

having been brought to the vertical position, it may be engaged by any part of the moving train, but because of the flexible connection between said finger and the shaft 20, such engagement with the finger may result in a depression of the finger automatically without damaging the mechanism. To provide for a suitable contact means on the locomotive I may use a shoe 34 connected to the pilot or any other suitable place on the locomotive, whereby the finger will be prevented from being damaged or doing damage to any part of the locomotive, but will be in position, by virtue of the spring 21, to operate the signal member 23 at the proper time. To prevent an undesired rotation of the shaft 20 when the finger is engaged by the shoe 34 or otherwise, I provide a lug 35 against which a stop 36 connected to the shaft 20 is adapted to impinge. Said stop 36, therefore, limits the rotation of the shaft 20 in one direction and determines the vertical adjustment position of the finger 22. I also provide a locking means to secure the shaft and finger in the position just described, whereby so long as any one of the switches is open, the actuator will be maintained in operative position. To this end I connect to the shaft 20 an auxiliary stop 36' which is adapted to be engaged by a latch 37 at the time the sprocket wheel 26 is completing its partial rotation under the influence of the chain 28. The means I have shown for operating the lock comprises a finger 38 secured to the sprocket wheel 26, the outer end of the finger operating upon a cam surface 37' adjacent the free end of the lock 37. At the end of said partial rotation of the sprocket wheel, the end of the finger 38 passes the end of the cam 37' and is in position to constitute a positive stop for the lock 37, the nose 37'' of which will have passed across the path of the lower end of the stop 36', thereby preventing a reverse rotation of the shaft 20 or the gearing connected thereto. When, however, the last open switch is closed, the spring 31 will restore all of the parts to normal position. The action of the chain 28 at this time will cause the finger 38 to be withdrawn from the lock 37, permitting the lock to swing on its pivot out of engagement with the stop 36' by virtue of a spring 39. The outward swing of the lock may be limited by a pin 40. At this time it will be understood that all of the bell cranks will be disposed with their horizontal arms at right angles to the track rails and all of the flexible connections 32 will be taut. It will be understood, furthermore, that the mechanism at the signal station at 15' will be of the same character and having the same functions as the mechanism at the station 15, and specific description of the same will be unnecessary.

The several parts of the device may be

made of any suitable materials and the relative sizes and proportions thereof may be varied without departing from the spirit of the invention.

5 Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a device of the character set forth, the combination of a plurality of switches, an actuator, and connections between the switches and the actuator whereby on the opening of any switch the actuator will be set in operative position, such connections comprising a series of bell cranks pivoted adjacent the respective switches, a bar connected at one end to the actuator, and flexible connections between the bar and the several bell cranks.

2. In mechanism for actuating a signal

device, the combination of a rotary shaft, 20 a finger flexibly connected to the shaft, a sprocket chain, gearing between the sprocket chain and the shaft to cause positive rotation of the shaft when the chain is drawn in either direction, means to draw the chain, 25 and locking means for the shaft including a stop carried by the shaft, a lock movable in the rear of said stop, and a finger carried by the gearing to hold the lock in locking position. 30

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE HENRY RICE.

Witnesses:

C. J. WEBSTER,  
JOE. CAHILL.