

(No Model.)

2 Sheets—Sheet 1.

H. McL. ABERNETHY & J. M. GRAHAM.
SAFETY SWITCH SIGNAL DEVICE.

No. 521,690.

Patented June 19, 1894.

Fig. 1.

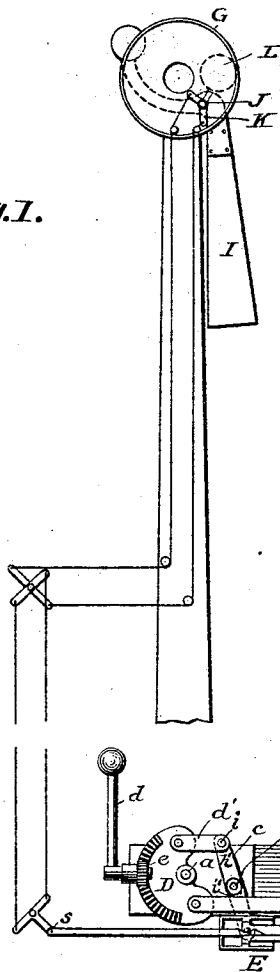
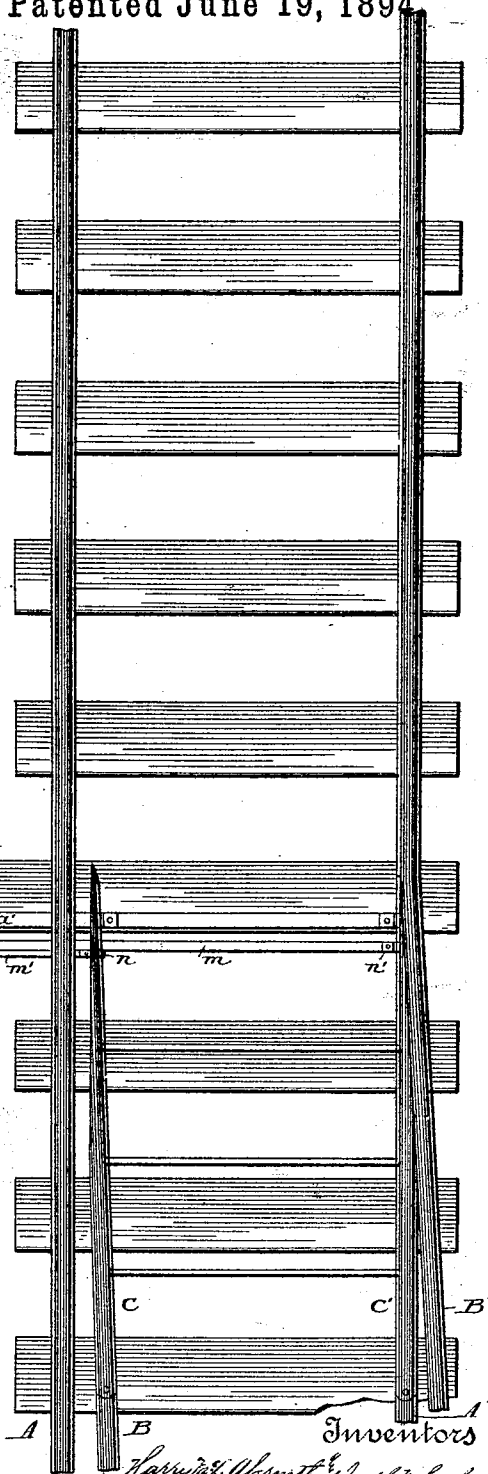
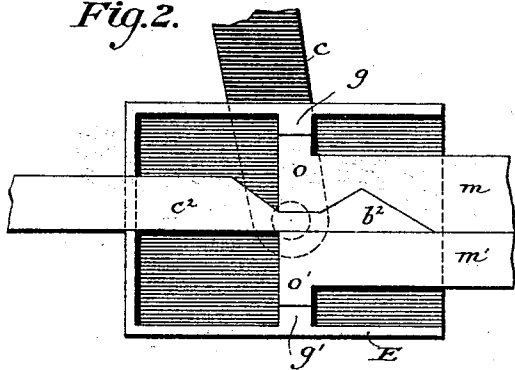


Fig. 2.



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their Attorney.

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Fig. 3.

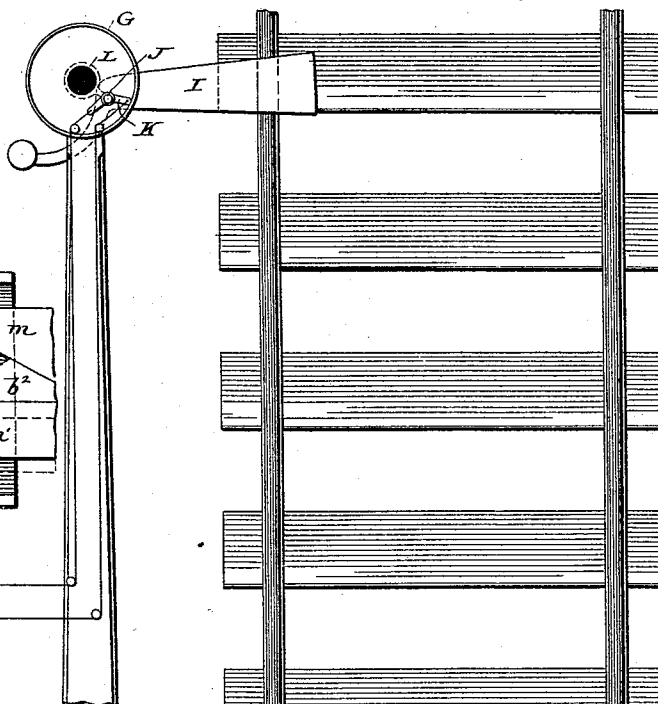


Fig. 5.

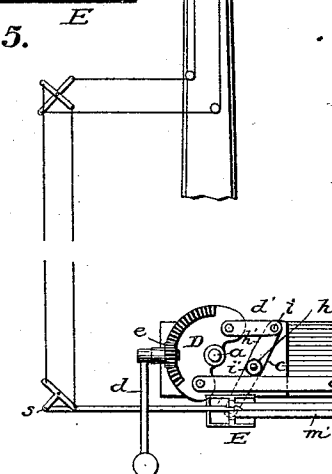
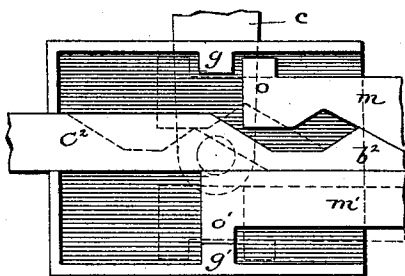
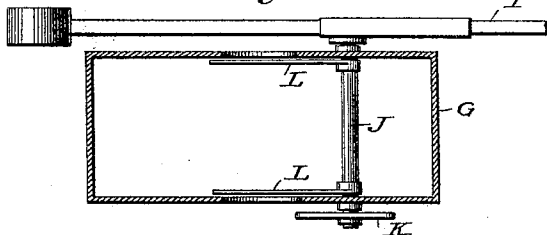


Fig. 4.



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UNITED STATES PATENT OFFICE.

HARRY MCLEAN ABERNETHY AND JOSEPH MARSHALL GRAHAM, OF
NEWARK, OHIO.

SAFETY SWITCH SIGNAL DEVICE.

SPECIFICATION forming part of Letters Patent No. 521,690, dated June 19, 1894.

Application filed December 2, 1893. Serial No. 492,584. (No model.)

To all whom it may concern:

Be it known that we, HARRY MCLEAN ABERNETHY and JOSEPH MARSHALL GRAHAM, citizens of the United States, residing at Newark, in the county of Licking and State of Ohio, have invented certain new and useful Improvements in Safety Switch Signal Devices, of which the following is a specification.

The object of our invention is to provide in connection with railway switches and switch stands a signaling device for always displaying a "danger signal" in the event of the switch rod being accidentally disconnected and hence, fail to properly throw the switch point or points after the usual operation of throwing over the switch lever, or when the switch point or points, from any cause whatever, remain in a position other than that of absolute safety, thus warning the engineer of an approaching train in sufficient time to stop the train before reaching the switch.

Our invention consists in combining with the switch operating mechanism certain signal mechanism which is also connected to the switch point and leading from thence to a signal post located at any suitable distance from the switch, said post supporting a counter-balanced semaphore arm by day and a signal light by night, the said counter-balanced semaphore maintaining the intermediate mechanism normally under a pull or tension during the perfect condition and working order of the switch operating parts and switch point or points, otherwise, allowing the signal to indicate "danger" and so remain until all defects or obstructions to the working parts of the switch operating mechanism and switch point or points shall have been removed and the signal again set to indicate "safety."

Our invention further consists, in a certain combination and arrangement of parts, more fully described hereinafter, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of our improved safety switch signal device, illustrating the parts in their normal position, and showing the signal post in side elevation, with the signal indicating "safety;" Fig. 2, an enlarged plan view of the box, with its lid or cover re-

moved, illustrating the construction of the loose ends of the signal rods or bars, and the end of the bar leading to the intermediate mechanism engaging therewith. Fig. 3, also, illustrates an enlarged plan view of the box with its lid or cover removed, showing the positions assumed by the ends of the signal rods or bars and the end of the bar engaging therewith, when the working parts are out of order, disconnected or obstructed. Fig. 4 illustrates a transverse sectional view of the casting supported by the signal post, showing in plan the counter-balanced semaphore and lenses for the signal light. Fig. 5 illustrates in plan certain parts of our improved device with the signal post and its appurtenances in side elevation.

A, A', represent the main track rails, B, B', the siding track rails, C, C', the switch points.

D, is the ordinary switch stand pivoted at *a*, and *d*, the weighted switch operating lever, provided with a pinion *e*, gearing with the switch stand, and adapted to impart, during the operation of the switch lever, a vibrating or rocking motion to said stand. To one end of the switch stand is secured the switch operating rod *a'*, which extends to and is securely fastened to each of the switch points, and to the other end of the switch stand is suitably secured an arm *d'*.

c represents a two-armed lever pivoted at or near the center *h*, one arm *h'* of which is fastened at *i* to the arm *d'*, and the other arm *i'* suitably attached to and carrying with it a covered box E, or its equivalent, provided with a removable lid or cover.

g, *g'* represent projections extending toward each other, in the same plane, and form a part of or securely fastened to the inner sides of the said box.

m, *m'* are the signal rods or bars, one end of each of which is suitably fastened to the switch points at *n*, *n'*, respectively, the other end, *o*, *o'*, of each of said signal rods or bars resting loosely, when in their normal position, between the said projections, as clearly shown in Figs. 1, 2 and 5, and are provided with cut-out portions as shown in Figs. 2 and 3. One end of a rod C², which normally rests within the box is provided with a beveled end *b*² and

cut-out portion, as clearly shown in Figs. 2 and 3, and adapted to rest and be clamped between the signal rods or bars, when the parts rest in their normal position, the other end of said bar projecting beyond the end of the box and connected at its outer end at s with suitable intermediate mechanism leading to the signaling device, which, in this instance, consists of a post situated at a suitable distance from the switch, said post supporting a casting G for the reception of the signal light, and a shaft J, which supports a counter-balanced semaphore arm I, a lens frame or frames L, to which is adapted a colored glass and a two-armed lever K, as shown in Fig. 4.

In practice, the customary throw or extreme movement of the switch points is from four to five inches; hence, we so construct and regulate our improved mechanism that when the switchman properly operates the switch lever, which operation, through the medium of the switch stand and pivoted lever, causes the box E to move with the said lever and traverse only the exact distance traversed by the said switch points, therefore, should the switch rod or signal bar or bars become disconnected from either of the switch points, or the switch point or points should from any cause whatever fail to move to and assume a safe position against the main track, or to move the exact distance traversed by the box, after the switch lever has been properly operated, one or both of the signal bars, which are loose in the box at one end as clearly shown in Fig. 2, will be forced away from the projections between which they normally rest, thereby permitting them to spread apart or separate as shown in Fig. 3, thus allowing the bar c^2 which is normally under a pull or tension, through the medium of the counter-balanced semaphore arm and intermediate mechanism leading to the said bar, to become disconnected, thereby relieving the tension or pull and permitting the counter-balance to throw the semaphore arm into a position indicating "danger."

When the switch point or points are caused to assume a position, from any cause whatever, other than that of safety, when the switch stand is locked, the signal bars which are securely fastened at one end to the switch point or points will be caused to be pushed or pulled away from their normal position in the box, see Fig. 3, in either instance, allowing the said signal bar or bars to be disconnected from the intermediate mechanism and permit the signal to indicate "danger." The counter-balancing weight exerts normally a certain tension on the intermediate apparatus, when in perfect working order and should any of the parts become disconnected or so obstructed as to prevent the switch point or points from assuming a position of absolute safety, the signal rods will become disengaged from the intermediate signal mechanism and, owing to the counter-balancing weight, cause the semaphore or signal

light to indicate "danger," in which position the signal will remain until such repairs are made or obstructions removed as will warrant the perfect working of the switch mechanism and switch point or points.

The intermediate mechanism shown in Figs. 1 and 5 leading from the signal post to the bell-crank lever forms no part of our invention, as any suitable mechanism, allowing for its expansion and contraction of the connecting wires, may be employed.

It will be understood that certain slight alterations and locations of the parts constituting our improved safety switch signal device, may be resorted to, without departing from the spirit of our invention.

What we claim is—

1. A safety switch signal device, consisting of a switch stand, to which is directly connected signal mechanism, the latter being also connected to the switch points, as set forth and described.

2. A safety switch signal device, consisting of a switch stand to which is connected both the switch operating mechanism and signal mechanism, the latter being also connected with the switch points through the medium of connecting rods, substantially as set forth and described.

3. The combination in a safety switch signal device, of a switch-stand, switch rod secured to said stand and switch points at one side of the pivotal point of the stand, and signal mechanism secured to the other side of said pivotal point and connected with the switch points through the medium of connecting rods and levers, substantially as described.

4. The combination in a safety switch signal device, of the switch stand, switch rod and arm secured thereto, and a lever, one end of which is connected to said arm and the other end to a box adapted to receive one end of the signal bars or rods, the other end of said bars or rods being suitably fastened to the switch points, as set forth and described.

5. The combination in a safety switch signal device, of the switch stand, switch rod and arm secured thereto, a pivoted lever, one end of which is secured to said arm and the other end adapted to carry a box, and the signal rods or bars suitably connected to the switch points, substantially as described.

6. In a safety switch signal device, the combination of the switch stand, switch rod secured to said stand and switch points, with signal mechanism connected to the switch stand and points and leading from the latter to the signal post, substantially as described.

7. In a safety switch signal device, the combination of the switch stand, switch rod secured at one end thereof, and an arm secured to the other end, a pivoted lever connected with said arm and adapted to support and carry with it a box, so constructed as to receive one end of the signal rod and one end of a bar to which the mechanism leading to

the signal post is suitably secured, substantially as set forth and described.

8. In a safety switch signal device, the combination of the switch stand, signal mechanism connected with said stand and switch points, and means for keeping the signal mechanism normally under tension, as set forth and described.

9. The combination in a safety switch signal device, of the switch stand, switch rod connecting said stand and switch points, signal rods connected to said switch points, the counter-balanced semaphore supported by the signal post, with mechanism located between and connected to the said counter-balanced semaphore and signal rods, said mechanism being normally under a pull or tension, substantially as set forth and described.

10. The combination with a switch stand, of the switch rod, and arm connected to said stand, a pivoted lever one end being secured to said arm and the other end supporting a box, rods connected to the switch points and terminating within said box, with a counter-balanced semaphore carried by the signal post, and mechanism leading from the said box to the counter-balanced semaphore, substantially as set forth and described.

11. In a safety switch signal device, a signal mechanism consisting of an arm attached to the switch stand, a pivoted lever secured at one end to the said arm and the other end supporting and carrying a box, rods or bars secured to the switch points and terminating in said box, a counter-balanced semaphore carried by the signal post, with mechanism leading from the box to said counter-balanced semaphore, substantially as described.

12. A signal device for railway switches, consisting of switch mechanism attached to the switch stand, signal rods or bars connected to the switch points, a counter-balanced semaphore carried by the signal post, said post being located at a suitable distance from the switch, with mechanism normally under tension leading from the said rods or bars to the counter-balanced semaphore, substantially as described.

13. A signal device for railway switches, having a box, the inner surface of each side of which is provided with a lateral projection, rods or bars secured at one end of the switch points, the other ends resting between said projections, and a bar loosely connected between the said rods within the box, and leading to a bell-crank lever to which is attached

mechanism leading to a counter-balanced semaphore, substantially as described.

14. The combination in a signal device for railway switches, of the arm secured to the switch stand, lever connected to the arm, a box carried by said lever and provided with a projection extending laterally from each side of the interior of the same, rods or bars connected at one end to the switch point or points and the other end resting loosely between said projections and adapted to receive between the loose ends a bar connected with mechanism leading to the signal post and counter-balanced semaphore, substantially as described.

15. The combination in a safety switch signal device, of the switch stand, pivoted lever, box connected to and supported by said lever and having lateral projections within the same, rods or bars one end of each being secured to the switch point or points and the other end of each resting loosely between said projections, a bar adapted to rest loosely between the loose end of said rods or bars, a counter-balanced semaphore, and mechanism normally under tension connecting the counter-balanced semaphore with the said bar, the latter and the rods or bars being so constructed as to permit the bar to disconnect and thereby allow the semaphore to indicate danger when the switch points are obstructed or disconnected, all substantially as described.

16. The combination in a safety switch signal device, of the switch stand, pivoted lever connected to and carrying with it a box, the latter having lateral projections within the same, the counter-balanced semaphore, mechanism normally under tension and leading from said semaphore to the box and terminating with a bar located within the box, signal rods or bars, one end being fastened to the switch points the other end resting loosely between the said projections and adapted to clamp said bar and normally retain it, yet release the same when the switch points become obstructed or disconnected, thereby permitting the signal to indicate danger, all substantially as set forth and described.

In testimony whereof we sign our names in the presence of two subscribing witnesses.

HARRY McLEAN ABERNETHY.

JOSEPH MARSHALL GRAHAM.

Witnesses:

HARRY Y. DAVIS,

E. A. FINCKEL.