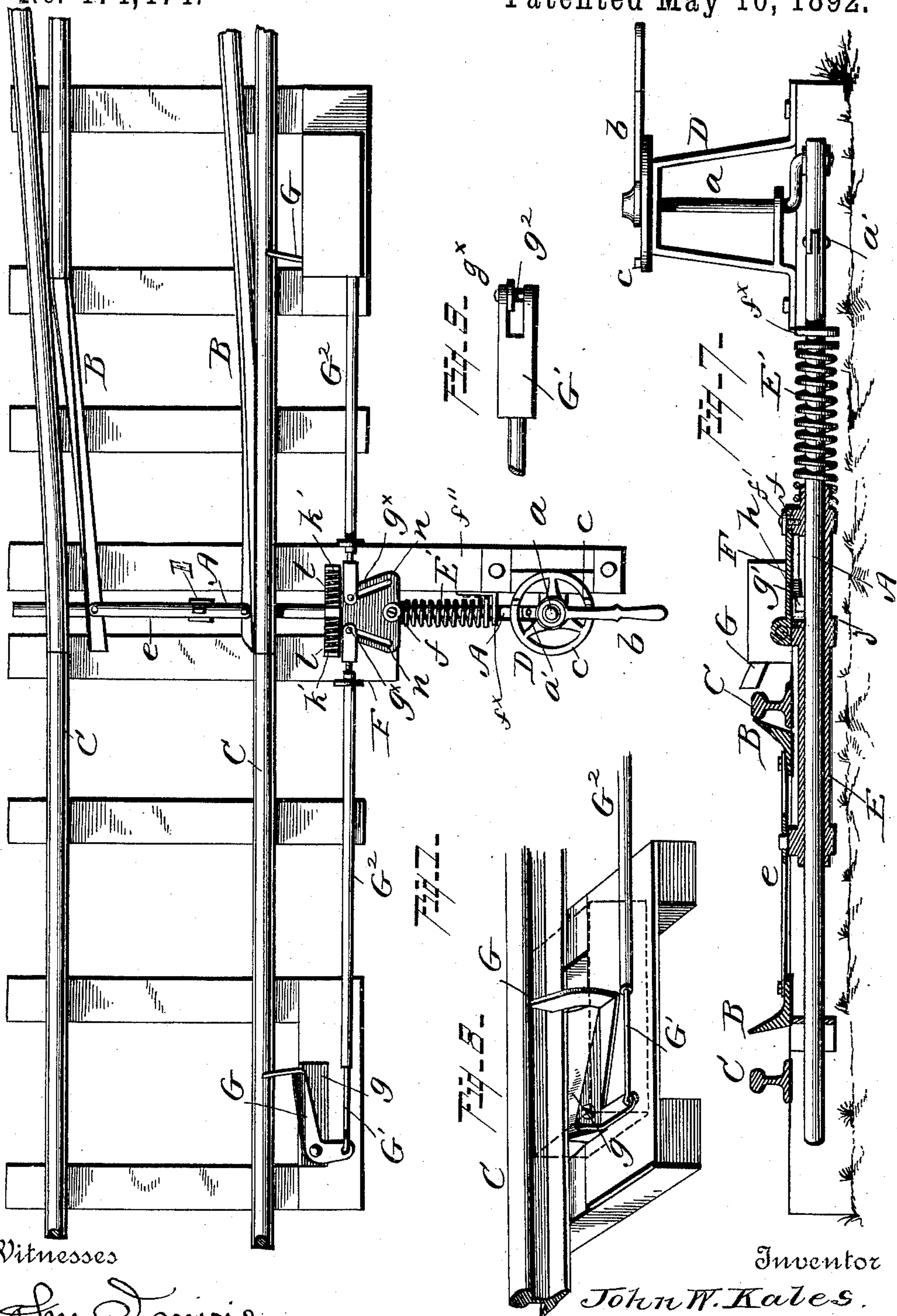


3 Sheets—Sheet 1.

# AUTOMATIC SAFETY SWITCH FOR RAILWAYS.

Patented May 10, 1892.



Witnesses

John T. Davis

Hany Bradford:

Inventor

John W. Kales.

By his Attorney

*Drane*

(No Model.)

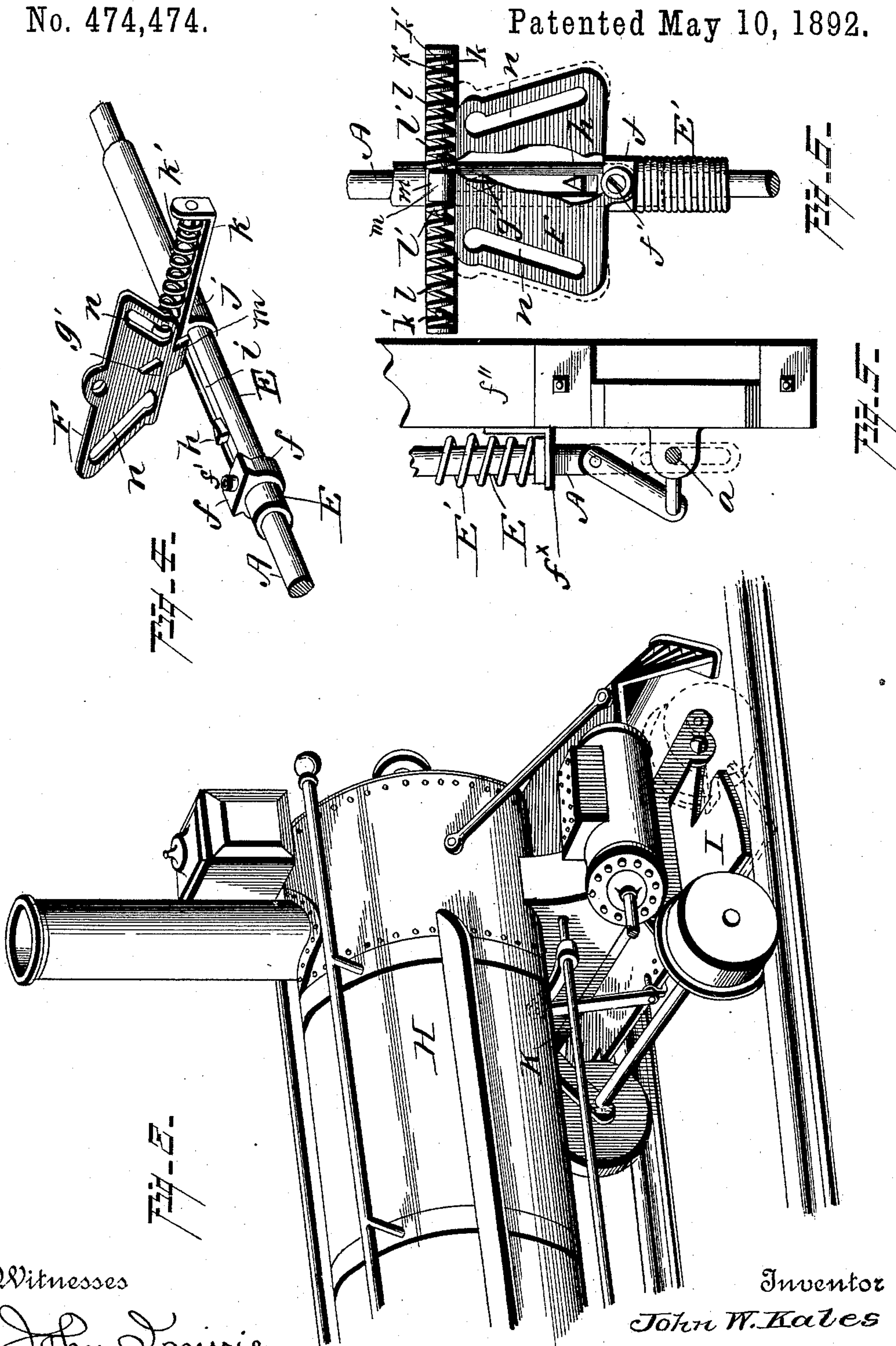
3 Sheets—Sheet 2.

J. W. KALES.

AUTOMATIC SAFETY SWITCH FOR RAILWAYS.

No. 474,474.

Patented May 10, 1892.



Witnesses

John D. Irvine  
Harry Bradford.

Inventor

John W. Kales

By his Attorney

L. Deane



(No Model.)

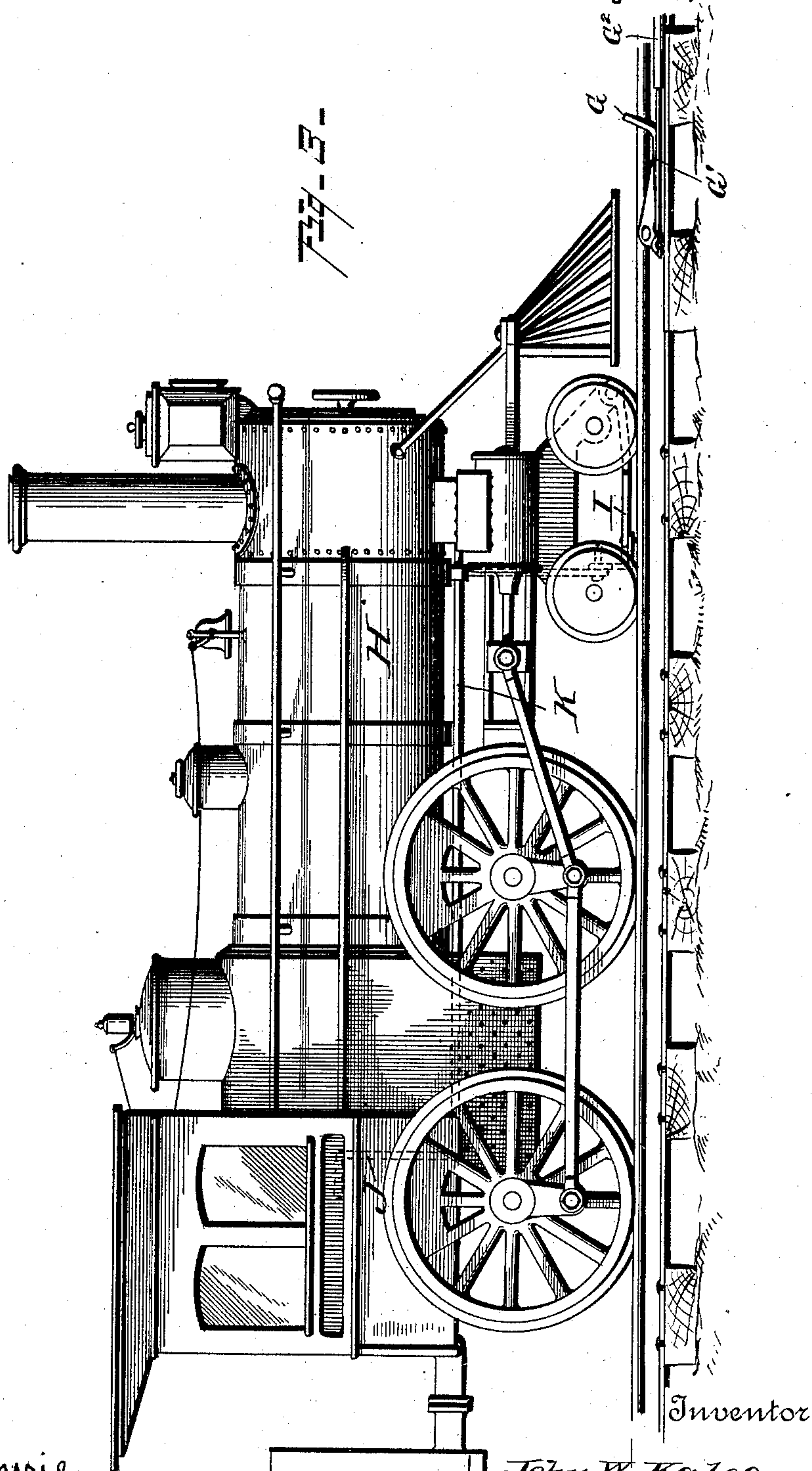
3 Sheets—Sheet 3.

J. W. KALES.

AUTOMATIC SAFETY SWITCH FOR RAILWAYS.

No. 474,474.

Patented May 10, 1892.



Witnesses

John D. Currie

Harry Bradford.

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# UNITED STATES PATENT OFFICE.

JOHN W. KALES, OF FRANKLINVILLE, NEW YORK.

## AUTOMATIC SAFETY-SWITCH FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 474,474, dated May 10, 1892.

Application filed May 21, 1891. Serial No. 393,631. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. KALES, a citizen of the United States, residing at Franklinville, in the county of Cattaraugus and State of New York, have invented certain new and useful Improvements in Automatic Safety-Switches for Railways; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain improvements in railway-switches; and it has for its object, among other things, to prevent the accidental side-tracking of the train and the possible misplacement of the switch-rails; also, to provide for closing the switch by the engineer and to prevent the opening of the switch except through the switch-stand lever and to effect the automatic locking of the switch when opened.

To these ends my invention consists in certain novel mechanism comprising a pressure-actuated device by the action of which the switch is automatically locked in its open position and by the release of which the automatic shifting of the switch-rails to the main track is effected; also, the combination therewith of mechanism adapted to be automatically operated from the locomotive, all as hereinafter more fully set forth, illustrated, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of the main track, switch, and the actuating mechanism. Fig. 2 is a broken perspective view of the front part of a locomotive, showing the shoe pivoted to the front truck. Fig. 3 is a side elevation showing the engine approaching the trip that operates the switch. Fig. 4 is a detail in perspective showing the triangular plate on the switch-bar sleeve tilted or thrown up and disclosing the triangular stud on its under side; also, the slot in the sleeve and the triangular stud on the switch-bar projecting through said slot. Fig. 5 is an enlarged plan view of the end of the switch-bar, showing its crank, &c. Fig. 6 is a detail plan view illustrating the several relative positions of the triangular studs about in the act of engagement. Fig. 7 is an enlarged transverse sectional view of my invention. Fig. 8 is a detail of incline over which trip

moves. Fig. 9 is a detail showing rollers on end of rod G'.

In carrying out my invention I employ the switch-bar A, arranged to extend transversely under the switch-rails B and the rails of the main track C and suitably jointed through a crank or otherwise properly connected to the shaft *a* of the switch-stand D, said shaft having applied to its upper end the handle or switch-lever *b*, resting upon the preferably circular end portion of the switch-stand and engaging in its movement stops *c c* on said circular end portion.

Upon the switch-bar A is fitted a sliding sleeve E, pressed by the spring E', which is placed upon said bar, one end of said spring abutting against the collar *f*, presently more fully referred to, while the other end thereof rests against a bracket *f*<sup>x</sup>, secured to a support or cross-piece *f*<sup>11</sup>, as shown in Figs. 1, 5, and 7, through which brackets pass the bar A, and pivotally connected to one end of sleeve E is a plate-like bar *e*, connecting the switch-rails B B together. Also upon this sleeve is fitted a collar *f*, to which is pivoted, at one end, as at *f*', the triangular plate F, having upon its under side a triangular-shaped stud or projection *g*', adapted to engage, as hereinafter described, a like stud or projection *h*, secured to the switch-bar A and extending through a longitudinal slot *i* in the sleeve E. Also fitted upon the sleeve E, at the opposite end of the plate F, is a collar *j*, carrying a transversely-arranged bracket *k*, upon studs *k*', projecting inwardly, from the turned-up end portions of which are fitted the outer ends of springs *l l*, the inner ends of which are fitted upon studs *l'*, projecting outwardly from a projection *m* of the contiguous end of the pivoted plate F, whereby flexible or spring connection is provided at this point between the latter and the sleeve, or rather the collar *j*, carried by said sleeve, permitting a lateral movement or flexure of the plate, for the purpose presently seen.

G G are angular levers or trips pivoted upon inclined supports *g*, alongside of the track, the outwardly-bent portions of which levers or trips are adapted to be thrown or adjusted toward and near the main-track rail, while to their inner ends are connected the outer ends of rods G' G', incased in tubes G<sup>2</sup> G<sup>2</sup>,



the inner ends of which rods are provided with studs  $g^x$ , preferably furnished with rolls  $g^2$ , engaging oblique or inclined slots  $n\ n$  in the pivoted plate F, said levers or trips being suitably housed for protection from the weather. Between the wheels of the forward truck (front and back wheels) of the locomotive or engine H is suitably pivoted or hung the shoe I, adapted to engage the trips or levers G G, and actuated by the engineer by means of the lever J, arranged in the cab of the engine and having connection with said shoe by rod-and-crank-lever mechanism K K.

In operation, as the switch-lever is moved inward or toward the track the switch-bar A will be moved through and independent of the sleeve E in the same direction, carrying the stud  $h$ , which will be moved past and be brought into engagement with the stud  $g'$  of the plate F, the studs thus being interlocked and abutting each other back to back. The switch-lever is now moved in the reverse or outward direction, which, it is obvious, with studs  $g' h$  still interlocked, will bring or carry with it the sleeve E, and thus cause, by the engagement of the latter with the spring  $E'$ , the compression of the spring, and simultaneously shift the switch-rails to the siding. The movement of the plate F will actuate through the rods and their rollers or studs the levers, so as to elevate their upper ends to a position slightly above the track-rails, or so as to be conveniently engaged by the shoe actuated by the lever in the engine-cab, presently referred to. Thus the switch-rails will be normally adjusted for the siding, and be so retained against accidental displacement by the spring-pressure and the automatic interlocking action between the stud  $g'$  of the plate F, carried by the switch-rail-shifting sleeve E and the stud  $h$  of the switch-bar A, and are thus so held that when actuated they will automatically be thrown into engagement with the main-track rails, thus insuring the passage of the train without liability of being side-tracked or derailment. The engineer, as the train approaches the switch, actuates the lever J in the engine-cab to lower the shoe into engagement with the required angle-lever G, which will trip the plate F and effect the disengagement of the studs  $g' h$ , permitting the previously-compressed spring  $E'$  to shift through the sleeve E the switch-rails into alignment with the main-track rails.

It will be understood that I do not restrict myself to the particular means employed for actuating the angle-levers in shifting the switch-rails, as it is obvious that the construction of the same may be variously modified without departing from the spirit of my invention.

It will be seen that the switch-lever must first be actuated before the switch can be opened, and that when the switch is so opened it is automatically locked and can be automatically closed by the passing engine or without requiring the actuation of the switch-

lever; also, that the train is prevented from being accidentally side-tracked, and the possible misplacement of the switch is obviated.

In practice the operative parts will be protected against the weather. I have shown the right-hand trip so covered, and indicated by dotted lines how the other trip and the central portion of the mechanism may be thus protected.

I claim—

1. In a railway-switch, the combination, with the sliding sleeve connected to the switch-rails and adapted to be actuated by mechanism released by the shoe on the engine or locomotive, of the switch-bar extending through said sleeve and having a stud interlocking with a stud on a pivoted spring-held plate carried by said sleeve, substantially as set forth.

2. The combination, with the switch-bar passing under the rails and operated by a switch-lever, of a sleeve on said bar, to which the rails are connected, and a plate pivoted upon said sleeve and having therein at its sides slots, and rod connections movable in said slots, said plate and switch-bar having interlocking studs, and tripping devices on the outer ends of said rods adapted to be operated by suitable means attached to the forward truck of the engine or locomotive, substantially as set forth.

3. In combination with the switch-bar and sliding sleeve thereon, said bar having a stud and said sleeve a pivoted spring-held plate, provided with a stud adapted to interlock with the stud on the bar, and mechanism for automatically operating the switch, as set forth, a spring secured to the switch-bar, which operates, when the tripping mechanism has been moved by the approaching engine, to automatically move the switch.

4. In combination with the slotted sleeve and the bar having projecting beyond said slot a triangular stud, a plate pivoted upon said sleeve and having on its under side a triangular stud, said studs being adapted to be actuated to engage base to base and to be thus held under spring or other pressure, substantially as set forth.

5. In a railway-switch, the combination, with the sliding sleeve and switch-bar carrying a stud projecting through a slot in said sleeve, of the plate pivoted to said sleeve and having a stud adapted to engage and stand base to base with the aforesaid stud, the bracket secured to said sleeve and carrying springs, between which is received and held a projection on the free end of said plate, substantially as set forth.

6. In a railway-switch, the combination of the switch-bar having a stud, the slotted sleeve sliding on said bar and connected to the switch-rails, the plate pivoted to said sleeve and having a stud interlocking with the stud on said bar, the bracket secured to said sleeve and carrying springs, between which is received a projection on said plate,



and the angular lever adapted to be adjusted with relation to one of the main-track rails and having connected thereto rods having studs engaging slots in said plate, substantially as set forth.

7. The combination, with the switch-bar and sliding sleeve thereon, said bar having a stud and said sleeve a pivoted spring-held plate provided with a stud adapted to interlock with the stud on the bar, of mechanism for automatically operating the switch, comprising the rods arranged alongside of the track and having oblique slot-and-stud connection with said pivoted spring-held plate, and means for the actuation of said latter rods, and the spring abutting against a collar on said sleeve and resting against a fixed bracket, substantially as set forth.

8. The combination of the switch-bar, the sliding sleeve thereon, said bar having a stud and said sleeve having a pivoted spring-held plate provided with a stud adapted to interlock with the stud on the bar of the rods arranged alongside of the track and having oblique slot-and-stud connection with said spring-held plate, the spring encircling said switch-bar and abutting against a collar on said sleeve and resting against a fixed bracket, and the angle-levers connected to the latter rods, substantially as set forth.

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

JOHN W. KALES.

Witnesses:

HAMILTON TERRY,  
ALBRO O. HOLMES.