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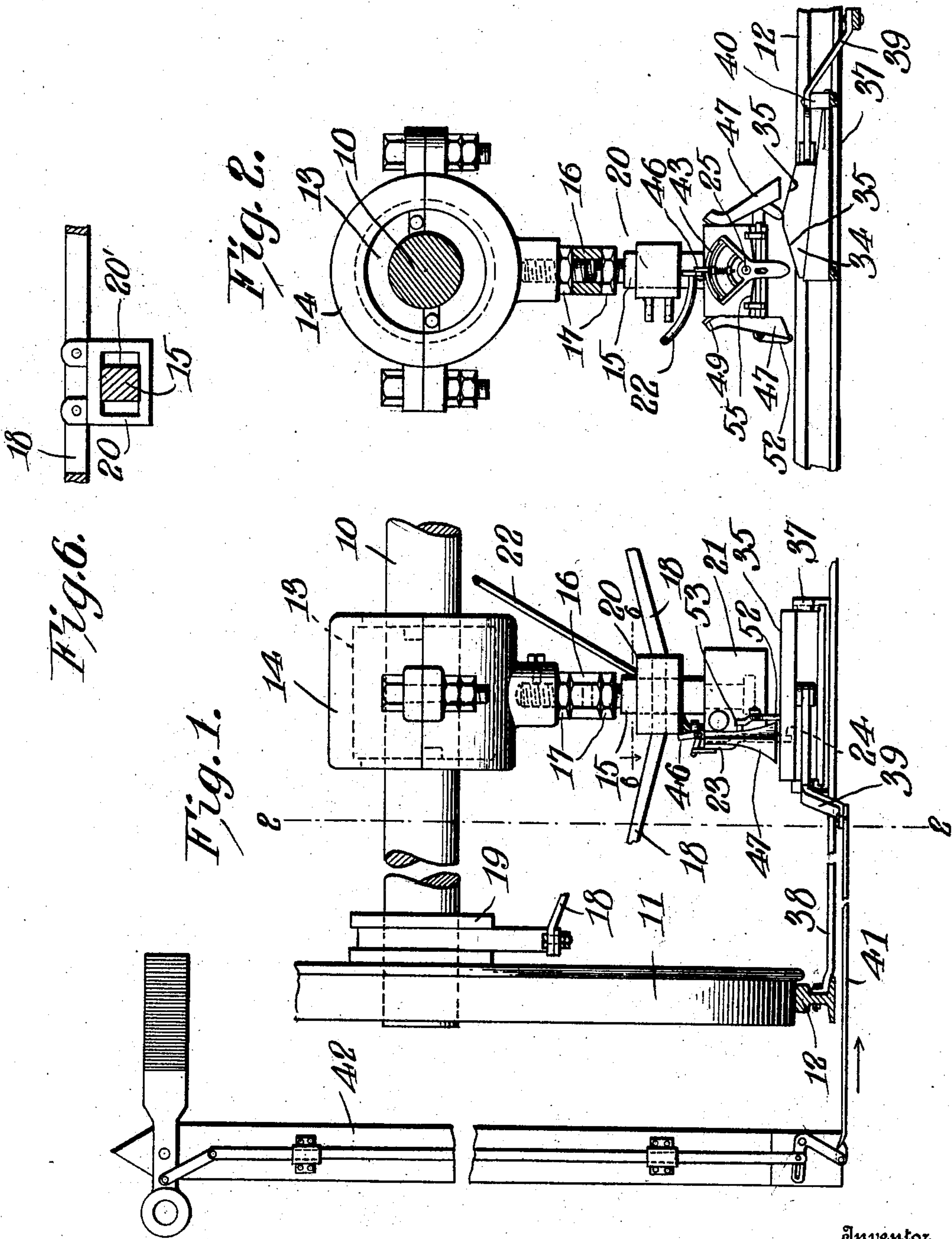
PATENTED JUNE 23, 1908.

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AUTOMATIC STOP FOR RAILWAY TRAINS.

APPLICATION FILED OCT. 1, 1907.

2 SHEETS—SHEET 1.



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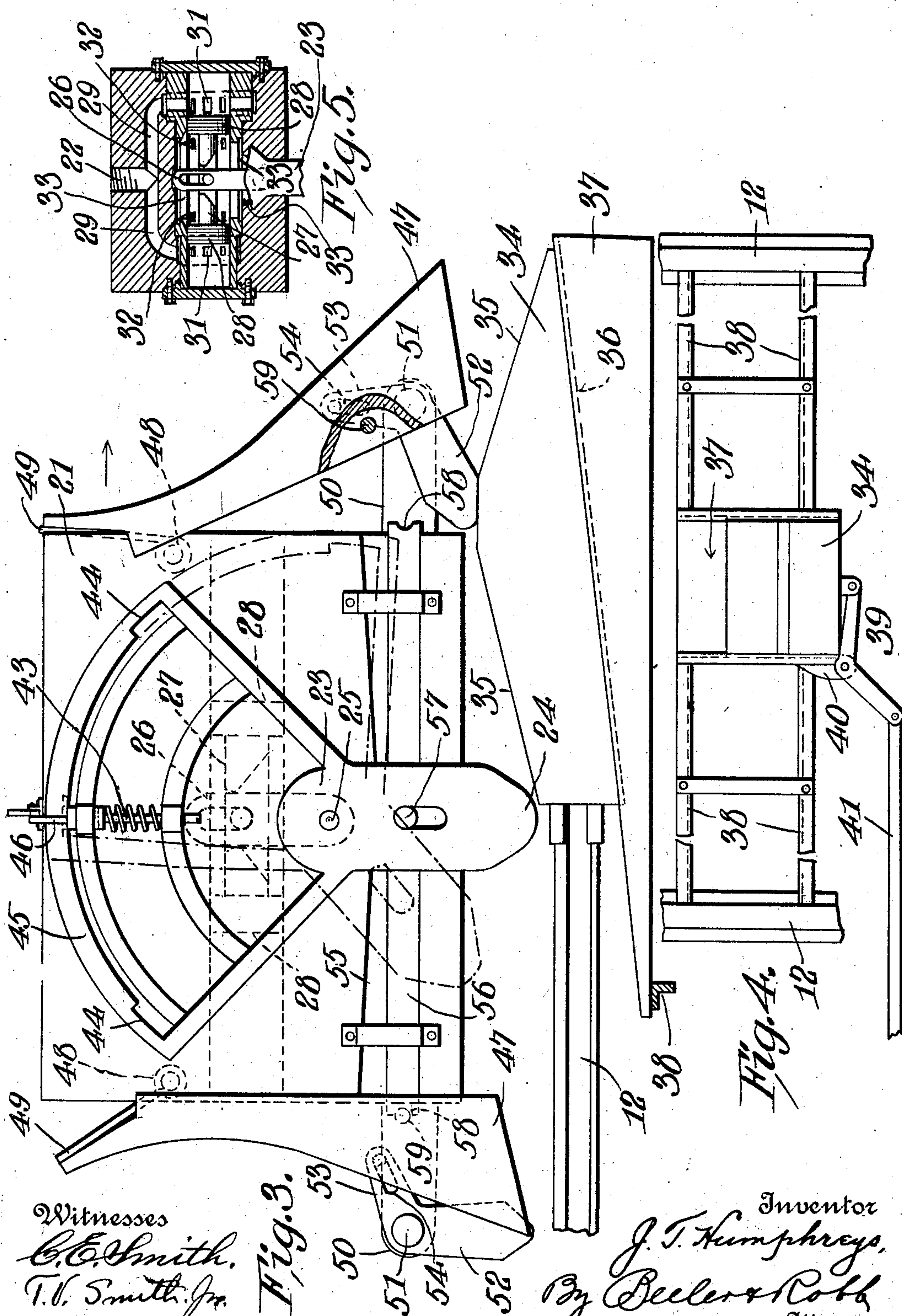
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# UNITED STATES PATENT OFFICE.

JOHN T. HUMPHREYS, OF WASHINGTON, DISTRICT OF COLUMBIA.

## AUTOMATIC STOP FOR RAILWAY-TRAINS.

No. 891,258.

Specification of Letters Patent.

Patented June 23, 1908.

Application filed October 1, 1907. Serial No. 395,405.

*To all whom it may concern:*

Be it known that I, JOHN T. HUMPHREYS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Automatic Stops for Railway-Trains, of which the following is a specification.

This invention relates to brake mechanism for railways, and especially to means whereby under certain conditions a car or train will be automatically stopped in the event that the motorman or engineer for any reason fails to observe the danger signal.

The devices constituting the present invention are designed to be operated by any suitable switch or signaling mechanisms, and simultaneously therewith.

Among the several objects aimed at in this invention are to provide a device of the character above indicated which shall be comparatively cheap in construction, easy of application, more certain of operation than previous devices contemplated in this art, and which is not likely to become out of order.

For a full understanding of the invention, and the manner in which I accomplish the foregoing and other objects, reference is to be had to the following detail description and the accompanying drawings, in which:

Figure 1 is a fragmentary front elevation of the present invention in applied position, and showing also a well known type of semaphore for coöperation therewith; Fig. 2 is a transverse elevation of the principal parts of the invention, as viewed on the line 2—2 of Fig. 1; Fig. 3 is a side elevation of the valve mechanism and coöperating parts; Fig. 4 is a detail plan view of certain supporting mechanism secured to the railway rails; Fig. 5 is a vertical sectional view of one form of valve mechanism, and Fig. 6 is a detail on the line 6—6 of Fig. 1.

In all the views of the drawings similar parts are referred to by like reference characters.

In the drawings the numeral 10 indicates an axle of any suitable railway vehicle, such for instance as a street car or a locomotive, preferably the latter, and 11 is a wheel running upon a rail 12. Rigidly secured to the axle 10, between the tracks, is a collar 13, and journaled on said collar is a yoke 14.

The yoke is preferably made in sections as indicated, and supports in any suitable position,

depending upon the character of the truck with which the device is employed, a rigid standard 15. The position indicated in the present instance in which the standard is supported, is a vertical one and pendent from said yoke.

In case the device were to be attached to a car axle which operates too closely to the plane of the tracks, the position of the standard would be varied accordingly. The standard 15 is detachably secured in any suitable manner to the yoke as by screw threads and is then locked when in proper position. The standard furthermore is provided with two sections connected by a turn buckle 16 whereby the effective length of the standard may be varied in accordance with the particular type of truck to which the device is attached, or to compensate for variations due to wear of the parts of the rolling stock. Lock nuts 17 may be employed if desired to secure the turn buckle in adjusted position. As a suitable means for securing the standard in a substantially fixed position relative to rotation on the axle, I provide a brace 18 secured at its outer ends to the truck frame or any other suitable part 19 of the running gear, and rigidly secured at its middle portion to a box 20 and in which box the standard may move slightly longitudinally, the box having a slight space for lateral motion with respect to the standard, due to lateral swaying of the car or frame, such space being indicated at 20' in Fig. 6.

It is well understood that the wheels and axle of a locomotive are the only parts which have a practically fixed relation as to elevation with the track rails. The other parts of the car or locomotive are subjected to variations in elevation and also lateral swaying to a considerable extent. While therefore the outer ends of the braces 18 may have certain vibration due to the vertical swinging of the truck frame or other parts to which they are connected such movement will not affect the position of the standard 15, the box 20 being free to slide both vertically and laterally upon the standard 15 to permit of such vibration.

Rigidly secured to the lower end of the standard 15 and carried thereby is a valve mechanism 21 with which the train air pipe 22 has communication. Movably connected to the valve mechanism and controlling the position of the valve which closes normally the end of the train pipe 22, is a striking ele-



ment 23, the lower end 24 of which normally projects downwardly below the main portion of the valve mechanism. The striking member 23 is herein indicated as being pivoted at 5 25 to the valve casing 21 and projecting outwardly from the axis of the pivot is an arm 26 having a pin and slot connection with a valve 27, the latter being shown in the present instance as being slidably mounted in the 10 valve casing. The valve 27 has pistons 28 at its opposite ends which control the exhaust from the several branches 29 of the train pipe 22. The valve operates within a removable sleeve 30 having perforations 31 15 communicating directly with the aforesaid air cavities 29, and also perforations 32 communicating directly with an exhaust 33. Upon movement of the valve in either direction from its mid position one piston 28 will 20 pass beyond certain of the perforations 31 and the other piston will pass certain of the perforations 32, whereby air under compression in the train pipe will exhaust through the chamber 33, and whereupon the car or 25 train will be immediately braked. It will be understood that any other suitable form of valve may be employed, such for instance as a rotary valve.

As a convenient means for causing the 30 striking member 23 to turn on its pivot and open the valve 27, I provide a contact member 34, the position of which is determined by the position of the switch or signaling mechanism before mentioned. In the pres- 35 ent instance the contact member 34 is indicated as cam shaped on its outer face, the cam being constituted by one or more inclined faces 35 and the bottom of the contact member having an incline 36 comple- 40 mental to a corresponding incline on the upper face of a stationary bed plate 37.

Referring especially to Fig. 4 it will be noted that the bed plate 37 is connected to and supported by an angle iron frame struc- 45 ture 38 secured to the inner faces of the railway rails, whereby the bed plate 37 is held in a definite fixed relation to the tops of the rails. The contact member 34 is slidably upon the bed plate 37 in a direction substan- 50 tially parallel with the rails, and by virtue of the complementary incline faces of the members 34 and 37, upon movement of the contact member, the cam surface thereof will be raised or lowered bringing the same into or 55 out of the path of the lower end 24 of the striking member. Suitable mechanism, including a bell crank 39 pivoted to some fixed point as for instance an ear 40 of the bed plate 37, is connected by a rod 41 to the sig- 60 nal or switch for operation therefrom. As a simple means for operating said rod 41 I have indicated a common form of semaphore 42, the latter however *per se* constituting no portion of my present invention. It will be 65 seen that upon setting the signal, by the

usual means not shown, so as to indicate that the block is occupied, the rod 41 will be moved in the direction indicated by the arrow on Fig. 1 and the contact member 34 will be moved upward upon the incline of the 70 bed plate so as to bring the cam portion thereof into the path of the member 23. If then the motorman or engineer fails to bring his car or train to stop before passing the signal, the mechanism comprising the present inven- 75 tion will be set into operation causing the brake mechanism (not shown) to automatically stop the car or train. Upon reverse movement of the signal or switch, the contact member 34 will be lowered and with- 80 drawn out of the path of the striking member. When the member 23 has been moved upon its pivot it will be locked in such position by some suitable mechanism, the same being indicated in this instance as a slidable 85 spring pressed locking bolt 43, which co-operates with a notch 44 at either end of the segment 45 of said member 23, the said bolt being supported upon the valve casing 21. Before the parts can be restored to their 90 normal position the engineer will be required to unlock the bolt 43, as by a finger piece 46.

In order to prevent snow, ice, or other material which may be located between the rails and over which the pilot of the locomotive may pass from engaging with the lower 95 extremity 24 of the striking member and thereby causing an unauthorized stoppage of the train, I provide mechanism upon the valve casing to clear the track for the said 10 lower end 24. Such mechanism is herein indicated as comprising a plow 47 pivoted at 48 to the casing 21 near its upper end. A spring 49 normally holds the plow downwardly against the end of the casing. Pro- 10 jecting from the end of the casing and adjacent to the said plow is a rigid bracket 50, upon the outer end of which is pivoted at 51 a hanger or runner 52, the lower end of which projects downwardly as far as the lower end 11 of the member 23. The runner 52 has an angularly arranged arm 53 which has a pin and slot connection 54 with the plow. The lower edge or point of the plow terminates slightly above the plane of the lower end of 11 the runner 52.

As indicated in Fig. 3 the plow mechanism just described is duplicated at both ends of the valve casing 21, and in this connection it is to be noted that the mechanism both by reason 12 of the double faced cam 34 and the duplicity of the plow mechanism is intended to be operable when the train is running in either direction. Loosely fitted within a groove 55 12 in the side of the casing 21 is a push bar 56 having pin and slot connection 57 with the striking member 23. At the end of said bar is a notch 58 which co-operates with a pin 59 connected with the plow. It being requisite that the plow shall extend downwardly prac- 13



tically shielding the member 23, when in its normal position, it will be noted that unless there be some means to lift it so as not to engage the cam member 34 the same would become broken, in the event that a danger signal were passed. With reference to Fig. 3 it will be observed that the member 52 will first engage the cam face 35 of the member 34 causing the runner to turn upon its pivot, and by virtue of the pin and slot connection 54 will cause the plow to swing upon its pivot 48 against the tension of the spring 49 and thereby clear the contact member 34. The lower end 24 of the striking member will then engage the contact member 34 and turning upon its pivot will not only open the air brake valve as before indicated but also by means of the pin and slot connection 57 with the push bar 56 will elevate the rear plow and cooperating parts so that the same will not be broken by the cam. Said rear plow will be held in such position by virtue of the said connections and the lock 43 until released by the engineer. Upon such release the spring 49 of the lifted plow will restore the parts to their normal position.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent of the United States, is:—

1. In a device of the character specified, the combination of an axle, a standard supported by the axle, train pipe valve mechanism carried by said standard and including a movable striking member, a contact member, and means whereby the contact member may be moved into the path of the striking member to open the train pipe.

2. A trip-controlled brake mechanism comprising, in combination, an axle, a collar fixed thereto, a standard suspended from said collar, brace mechanism to hold said standard in a certain position, means to vary the effective length of the standard, train pipe valve mechanism carried by the standard and maintained thereby at a definite elevation with respect to the axle, said valve mechanism including a movable striking member, signaling mechanism, and means controlled thereby to be engaged by said striking member to cause the latter to open the train pipe.

3. Automatic brake mechanism comprising, in combination, track rails, an axle, air pipe valve mechanism supported thereby and including a pivoted striking member, a bed plate having an inclined face, means for rigidly securing said plate between the track rails, a contact member having an inclined face complementary to the said face of the bed plate and supported thereon and also having an outer cam surface, and means for sliding the contact member upon the bed plate to bring its cam surface into the path of the said striking member.

4. In an automatic stop mechanism for

railways, an axle, valve mechanism for the train pipe supported from said axle, said valve mechanism comprising a pivoted striking member and a slidable valve having a piston at each end, a bed plate rigidly secured below and in the vertical plane of said striking member, a slidable contact member located upon said bed plate and having one or more inclined cam faces, signaling mechanism, and means connected with the same and with the slidable contact member to bring the latter into the path of the pivoted striking member upon movement of the signaling mechanism to one position.

5. Valve mechanism for an automatic stop for railways comprising, in combination, a valve casing, a valve movable therein, a movable striking member carried by the casing and connected with the valve, and means movably secured to the end of the casing and operably connected with the said striking member to prevent obstacles on the way from causing an unauthorized movement of the valve mechanism.

6. In a valve mechanism for automatic stops, the combination of a pivoted striking member having a downwardly extending end, a plow pivoted near its upper end to the casing and whose lower end guards the path of said lower end of the striking member in its normal position, and means pivoted to the forward end of the casing and having cooperative connection with the plow to move the latter upon its pivot.

7. In valve mechanism for automatic stops, the combination of a valve casing, a locking bolt slidably attached thereto, a valve within the casing, a striking member pivoted to the casing and having connection with said valve and also being provided with a notch in which said bolt may engage, a push bar slidably mounted on the casing and connected with said striking element, and spring operating means cooperating with said push bar to restore the striking member to its normal position upon release of the locking bolt.

8. In a valve mechanism of the character described, the combination of a valve casing, a valve movable therein to control the outlet of the train air pipe, a movable striking member on the casing and having connection with said valve, the striking member being extended downwardly below the said casing, a plow movably connected with the casing and whose lower end projects below the casing within the plane of movement of said lower end of the striking member, a bell crank runner pivoted upon the end of the casing and having pin and slot connection with the plow aforesaid, and a contact member adapted to be engaged by said runner to lift the plow and also by said striking member.

9. A valve mechanism for automatic stops comprising, in combination, a valve casing, a



valve movable therein to control the opening of the train air pipe, a pivoted striking member provided with a lower extension and a notched segment, a locking bolt slidably secured to the casing and adapted to cooperate with said segment to secure the striking member in a certain position, a push bar slidably secured to the side of the casing and operably connected to the lower extension of the striking member, plow mechanism pivoted to the casing, means for lifting the plow from its normal position, and spring mechanism to restore the several movable parts to their normal position upon release of the locking bolt.

10. In combination with a valve casing, a valve therein, a movable striking member having its lower end projecting downwardly below the casing, a plow movably connected to the casing to clear the way for the said striking member, a bracket on the casing, a bell crank runner pivoted upon said bracket and whose lower end projects downwardly slightly below the point of the plow and whose other end has pin and slot connection with the plow, a sliding push bar connected with the striking member and having loose connection with the plow whereby the latter may be lifted by the striking member in its movement.

11. In combination with a valve casing, a striking member pivoted thereto and having its lower end projecting downwardly below the casing, a plow pivotally secured at each end of the casing in alinement with the striking member, and a push bar mounted upon the casing and having connection with the

striking member, the ends of the push bar having loose connection with the plows, means cooperating with the several plows, whereby the forward one may be lifted independently of the striking member, and means connected with the plows for restoring the several parts to normal position.

12. In combination with railway rails and a truck including wheels and an axle, contact means operably secured to and between the rails, a supporting standard carried by said axle, the standard being adjustable as to its effective length, a train air pipe valve carried by said standard, and a striking member connected therewith for cooperation with said contact means.

13. The combination with air brake valve mechanism including a movable striking member, of a contact member, and means associated with the valve mechanism to prevent an unauthorized movement of the striking member, said means comprising a movable member projecting as low as the engaging portion of the striking member.

14. The combination of a truck including an axle, a contact member, air brake valve mechanism, and means supported on the axle and operable by engagement with the contact member for actuating the air brake valve mechanism.

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

JOHN T. HUMPHREYS.

Witnesses:

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JOHN A. PATTERSON.