No. 896,332. PATENTED AUG. 18, 1908.

H. G. SEDGWICK.

AUTOMATIC TRAIN STOP.

APPLICATION FILED AUG. 4, 1906.

Fig. 1.

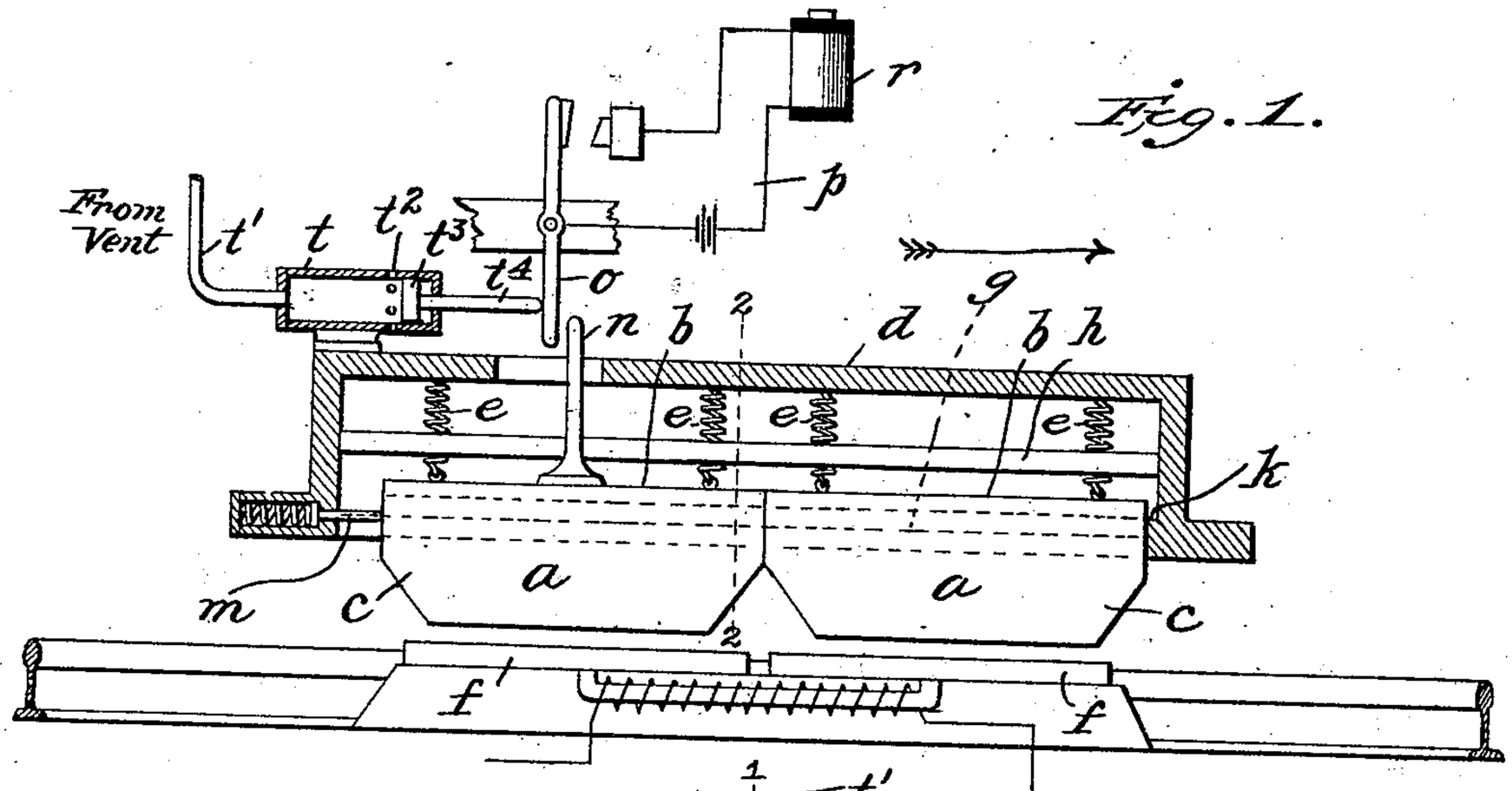


Fig. 2.

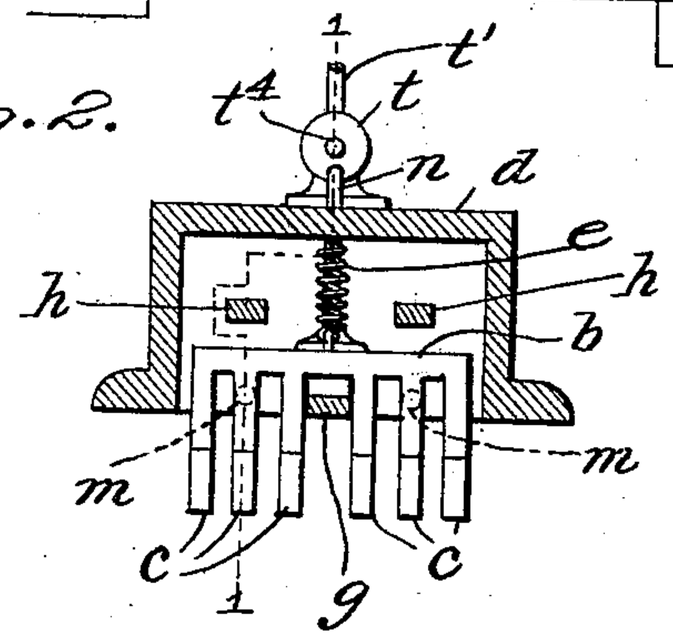
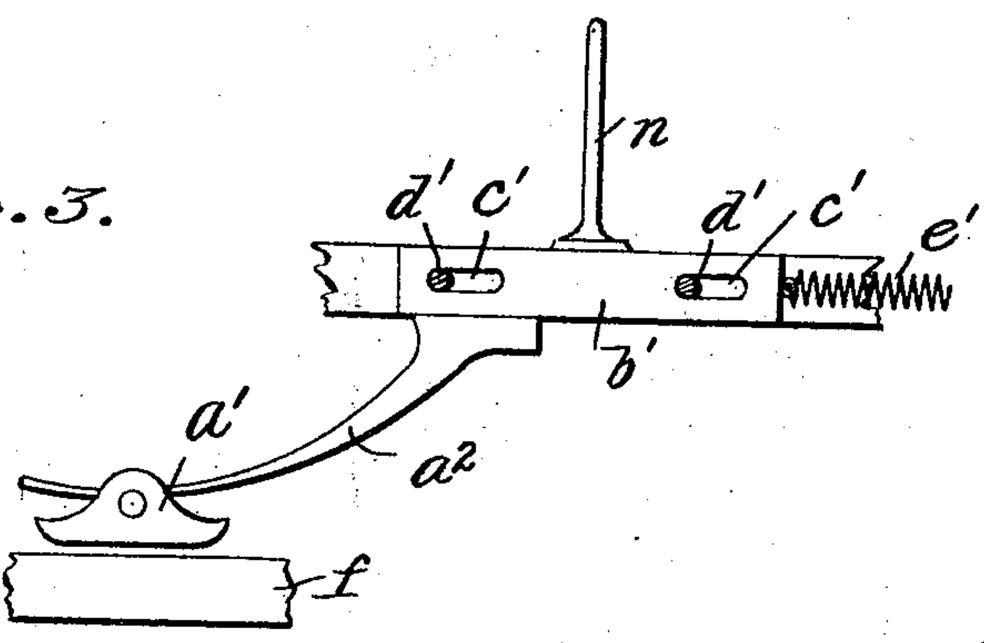


Fig. 3.



Witnesses

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AUTOMATIC TRAIN-STOP.

No. 896,332. Specification of Letters Patent. Patented Aug. 18, 1908.

Application filed August 4, 1906. Serial No. 329,234.

To all whom it may concern:

Be it known that I, HIRAM G. SEDGWICK, a citizen of the United States of America, and resident of Mill Valley, county of Marin, State of California, have invented certain new and useful Improvements in Automatic Train-Stops, of which the following is a full and clear specification, reference being had to the accompanying drawings, in which—

Figure 1 is a view partly in side elevation and partly in vertical section on line 2—2 of Fig. 2; Fig. 2 a vertical section taken through line 2—2 on Fig. 1; and Fig. 3 a detail side elevation of a modification of the armature.

This invention has relation to that class of train-stopping apparatus in which the braking mechanism is put into action by the actuation of an armature carried by the train, this armature being actuated when it passes over a magnet on the roadbed and this magnet being connected with suitable means whereby it is energized when it is desired to preëmpt any part of the adjacent roadway. The magnet energizing circuit may be closed manually or automatically by means operated by a preceding train or by the movement of switch rails or the opening of a drawbridge or the setting of a semaphore signal to danger or by other means.

As heretofore designed the armature carried by the locomotive has been mounted a sufficient distance from the roadbed to avoid being injured by coming in contact with roadbed obstructions as the train passes along. This necessitates a considerable gap between the armature and the magnet and this wide gap requires that the armature shall be very delicately mounted in order to respond to the magnetic action of the magnet as the train passes over the magnet. This delicate mounting of the magnet is objectionable not only because it is liable to speedily become deranged but also because it is liable to accidental operation by the jarring and rocking of the locomotive; and it is further objectionable for the reason that it requires a very powerful magnet to render it absolutely certain that the armature shall be actuated.

My present improvements are designed to obviate the foregoing objections by providing an armature arrangement which will not require that the armatures be delicately suspended or mounted nor which will require that they be suspended so high on the locomotive as to avoid roadbed obstructions as more fully hereinafter set forth.

Referring to the drawing annexed by letters, *a a* designate a pair of armatures each of which consists of a top plate *b* and depending plates *c* and which are suspended freely within a box *d* by means of springs *e*. A guide bar *g* runs longitudinally of the casing *d* and serves to guide the armatures in their longitudinal movements, the springs being arranged to hold the armatures in a horizontal position and to permit them a limited longitudinal movement on the bar *g*. Upward movement of the armatures is limited by the longitudinal bars *h*.

The road magnet is designated by the letter *f* and may be of any suitable construction and is so arranged on the roadbed that the lower straight edges of the armatures pass over the magnet in vertical alinement therewith, the entire lower edges of the armatures being presented to the action of the magnet. The armatures are kept normally pressed forward (in the direction of the arrow shown in Fig. 1 which arrow points towards the pilot of the locomotive) by means of a spring-actuated plunger *m* which presses normally against the rear end of the rear armature. I have shown two armatures but it is obvious that a greater or lesser number may be employed, the larger the number of armatures the greater the attractive force or drag obtained.

Attached to one of the armatures is an upward extending finger *n* which, when the armature carrying it is forced back against the action of the plunger, will actuate the brake applying mechanism. In this instance this part *n* is adapted to strike against the lower end of a switch lever *o* and thereby close the brake circuit *p* in which is included the brake magnet *r*, but it will be understood that movement of this part *n* may be transmitted to the brake applying mechanism in any suitable manner.

To restore the brake-actuating member *o* to normal after it has been once actuated, I may employ a cylinder *t* connected by a pipe *t'* to the exhaust from the vent pipe of the brake system, said cylinder being provided with a series of perforations t^2 near its forward end and with a piston t^3 whose piston rod t^4 extends out through the forward end of the cylinder in position to throw the lower end of the member *o* forward when said piston is moved

forward. It will be observed that when air is let into the cylinder t the piston rod t^4 will be driven forward and thus open the switch of the brake circuit, leaving it in normal position ready for another operation. When the piston t^3 has reached the forward extremity of its stroke it is arrested by the escape of the air through the holes t^2. Of course any other suitable mechanism may be employed to restore the brake-setting member o.

In the modification shown in Fig. 3 the armature a' is shown in the form of a shoe supported in the depending rearwardly extending end of a spring a^2 which is carried by a bar b' slidably mounted on a suitable part of the locomotive truck or frame and guided by pins d' and slots c', the bar b' carrying the actuating arm n and being normally pulled or pressed forward by means of a suitable spring e'. A great many other modifications are obviously possible within the scope of this invention.

When a train equipped with this improved armature passes over an energized roadbed magnet, the armature will be drawn down against the action of springs e and caused to come into actual contact with the pole pieces of the magnet. The attractive force of the magnet is so great when the armature is thus brought into contact with it that a strong backward pull or drag results which backward drag causes the armature to slide back on bar g against the action of the spring actuated plunger m and this backward movement of the armature is utilized to apply the train brakes automatically. When the armature passes beyond the magnet it is normally restored by means of plunger m and springs e. The forward and rear lower corners of each magnet are cut away to give a runner-like shape to it and this shape and the free resilient suspension of the armature permits it to have a free vertical movement whereby it may readily pass over obstructions on the roadbed without operating the brake mechanism, the tension of the spring behind plunger m being sufficiently strong to prevent rearward movement of the armature except when a very powerful drag is exerted upon the armature by the magnet.

It will be observed that with the construction above set forth the gap between the magnet and the armature is practically done away with since the armature may be suspended so low as to practically scrape the magnet as the train moves over it. Thus obviating the wide gap between the armature and the magnet does away with the necessity of nicely mounting the armature, thereby avoiding accidental derangement and applying of the brakes. It also permits me to employ a magnet of less strength thus greatly reducing the expense of equipping a road with this system. It will be observed that the armature cannot be actuated when the train is backing, so that it will be necessary to employ a duplicate set of apparatus on opposite side of locomotive pointing backwards which will actuate the brake mechanism when it passes over an energized magnet while the train is moving backward, but this will not be a disadvantage since it avoids using a reversing switch on the locomotive, which switch has been necessary in systems heretofore devised.

Instead of employing the duplicate set of armatures above pointed out it would be possible to employ but a single armature and have it actuate the brake mechanism whether it be slid forward or backward. This could be done by simply employing another spring actuated plunger at the forward end of the magnet and arranging another brake actuating member o so that the arm n would actuate it when the armature is dragged toward the pilot when the train is backing. This involves a mere duplication of the parts and I have therefore deemed it unnecessary to illustrate it.

Having thus explained the nature of the invention and described a way of constructing and using the same, without attempting to define all the forms in which it may be embodied or all the modes of its use, I declare that what I claim is:—

1. In a train-stopping apparatus, a magnet on the roadbed and train-stopping mechanism adapted to be actuated when the magnet is energized, said mechanism embodying a resiliently-suspended and horizontally movable armature and means for normally pressing it forward, said armature being suspended in such manner that when it passes over the magnet it is pulled or dragged backward.

2. In a train stopping mechanism, the combination of a roadbed magnet and train-stopping mechanism adapted to be actuated when it passes over the magnet, said mechanism embodying an armature suspended on springs in such manner that when the magnet is energized the armature will be drawn down into contact with the magnet as the train passes over the magnet.

3. The combination of a track magnet, an armature carried by a train and resiliently suspended and being free to move simultaneously downward and backward, and means controlled by said armature for operating the train-stopping mechanism.

4. The combination of a track magnet, an armature carried by a train and free to descend into contact with the magnet and to move longitudinally while in contact therewith, and means controlled by said armature for operating the train-stopping mechanism.

5. The combination of a track magnet, a railway vehicle carrying a resiliently suspended armature free to move vertically and horizontally, and means controlled by said

armature for operating the vehicle-stopping mechanism.

6. The combination of a track magnet, an armature carried by a train and free to move directly backwardly in a horizontal plane, and means controlled by the magnetic drag of the armature across the track magnet for operating the train-stopping mechanism.

7. The combination of a track magnet, an armature carried by a train and free to be moved in a plurality of directions by the magnet, means for automatically returning the armature to its normal position, and means controlled by the armature for operating the train-stopping mechanism.

8. The combination of a track magnet, an armature carried by a train and free to be moved in a plurality of directions by the magnet, means for returning the armature to its normal position, and means controlled by the armature comprising an electrical circuit including a switch, a magnet, and a battery, for operating the train-stopping mechanism.

9. The combination of a track magnet, an armature carried by a train and free to be moved in a plurality of directions by the magnet, means for returning the armature to its normal position, means controlled by the armature comprising an electrical circuit including a switch, a magnet, and a battery, for operating the train-stopping mechanism, and means for automatically throwing the switch to normal position.

10. The combination of a track magnet, an armature carried by a train and free to be moved in a plurality of directions by the magnet, means for replacing the armature to its normal position, means controlled by the armature comprising an electrical circuit including a switch, a magnet and a battery, for operating the train-stopping mechanism, and means for throwing the switch to its normal position by the released air from the train pipe.

11. The combination of a track magnet, an armature carried by a train and free to be moved in a plurality of directions by the magnet, means for replacing the armature to its normal position, means controlled by the armature comprising an electrical circuit including a switch, a magnet, and a battery, for operating the train-stopping mechanism, and means for throwing the switch to its normal position comprising a cylinder with an inlet and outlet, a piston, and a piston rod operated by the released air from the train pipe.

12. The combination of a track magnet, an armature carried by a train and free to be moved in a plurality of directions by the magnet, means for limiting the vertical movement of the armature, means for replacing the armature to its normal position and means controlled by the armature for operating the train-stopping mechanism.

13. In combination with a magnetic device on the roadbed, of a railway vehicle carrying an armature mechanism, consisting of a depending runner-like armature and means for supporting it whereby it shall have a free vertical movement and a backward movement in an approximately horizontal plane, means for normally pressing the armature forward, and means whereby the rearward movement of the armature is caused to actuate apparatus on the vehicle.

14. In combination with a magnet on the roadbed, of a railway vehicle carrying an armature apparatus comprising a runner-like armature and means whereby the armature is resiliently suspended and is permitted to have a limited vertical movement to and from the magnet, and means whereby the movement of the armature actuates apparatus on the vehicle.

15. The herein described means for stopping vehicles comprising an electro-magnet, an elongated terminal for said magnet, and means to energize said magnet and magnetize said terminal whereby portions of the vehicle will be attracted to and held in frictional contact with the terminal throughout the length of the terminal.

In testimony whereof I hereunto affix my signature in the presence of two witnesses this 26th day of July, 1906.

HIRAM G. SEDGWICK.

Witnesses:
H. A. MIERS,
J. T. SMITH.