J. F. WEBB, Jr.

TRAIN STOPPING MECHANISM.

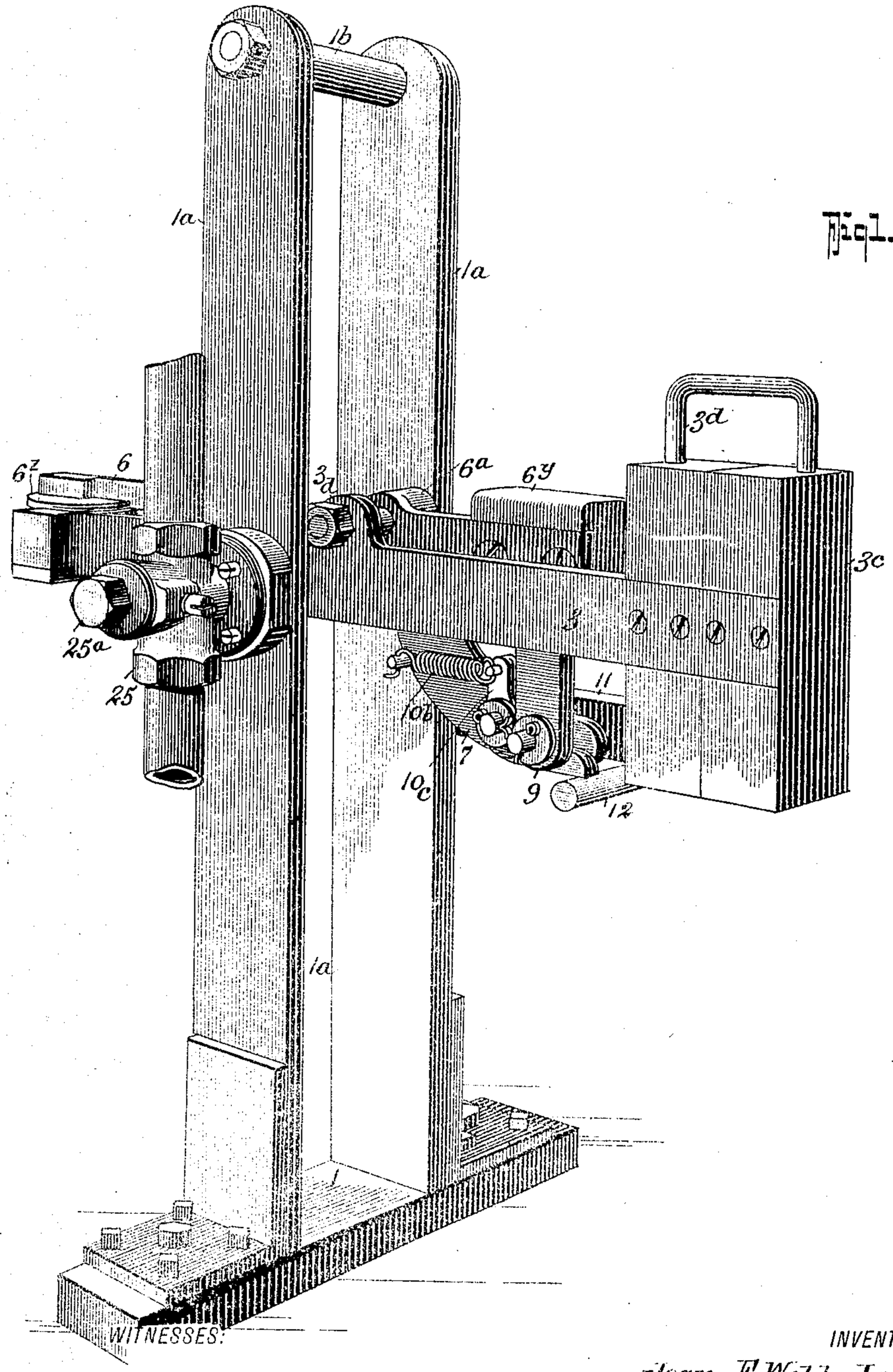
APPLICATION FILED OCT. 15, 1908.

925,733.

Patented June 22, 1909.

4 SHEETS—SHEET 1.

Fig. 1.



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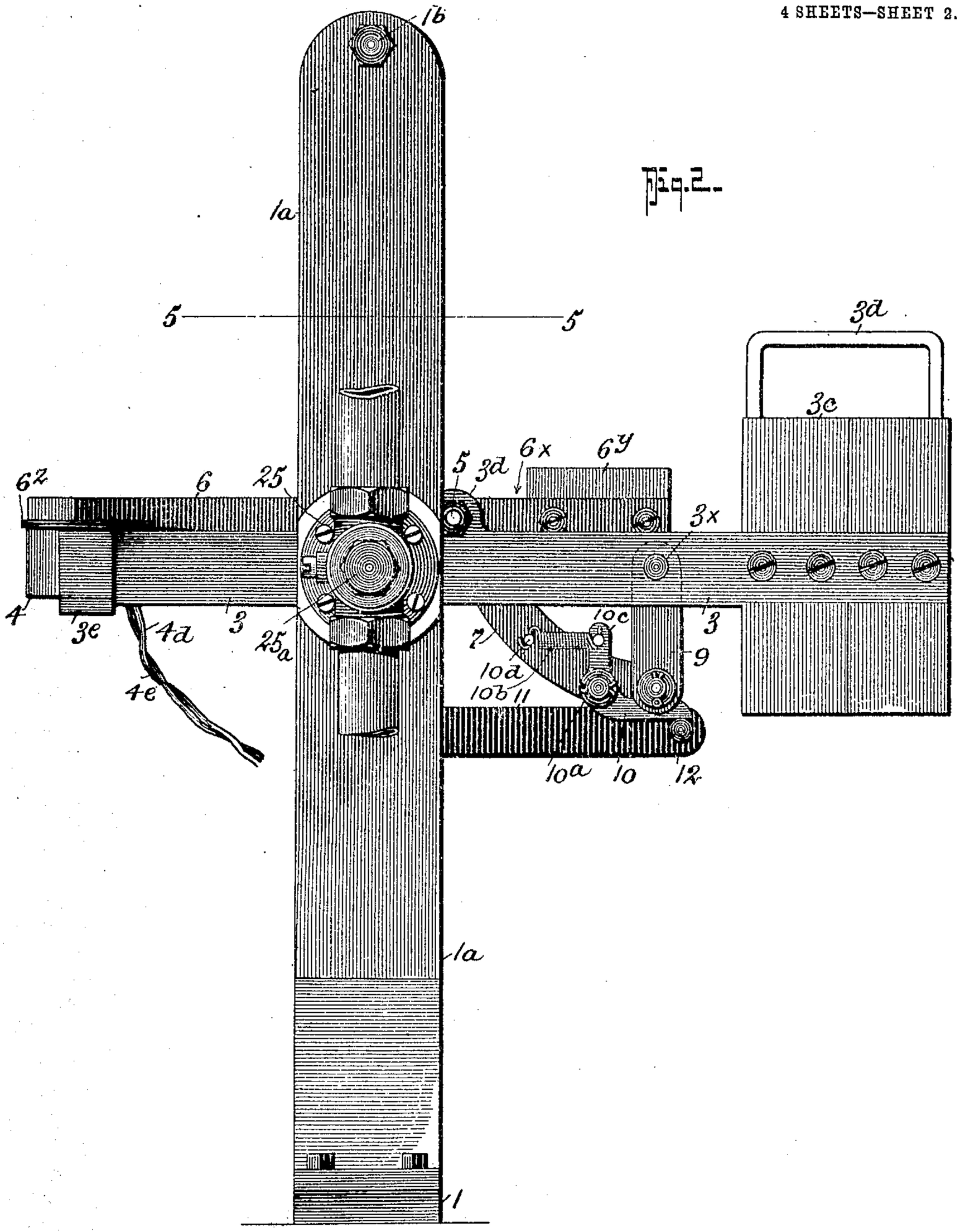
4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 2.

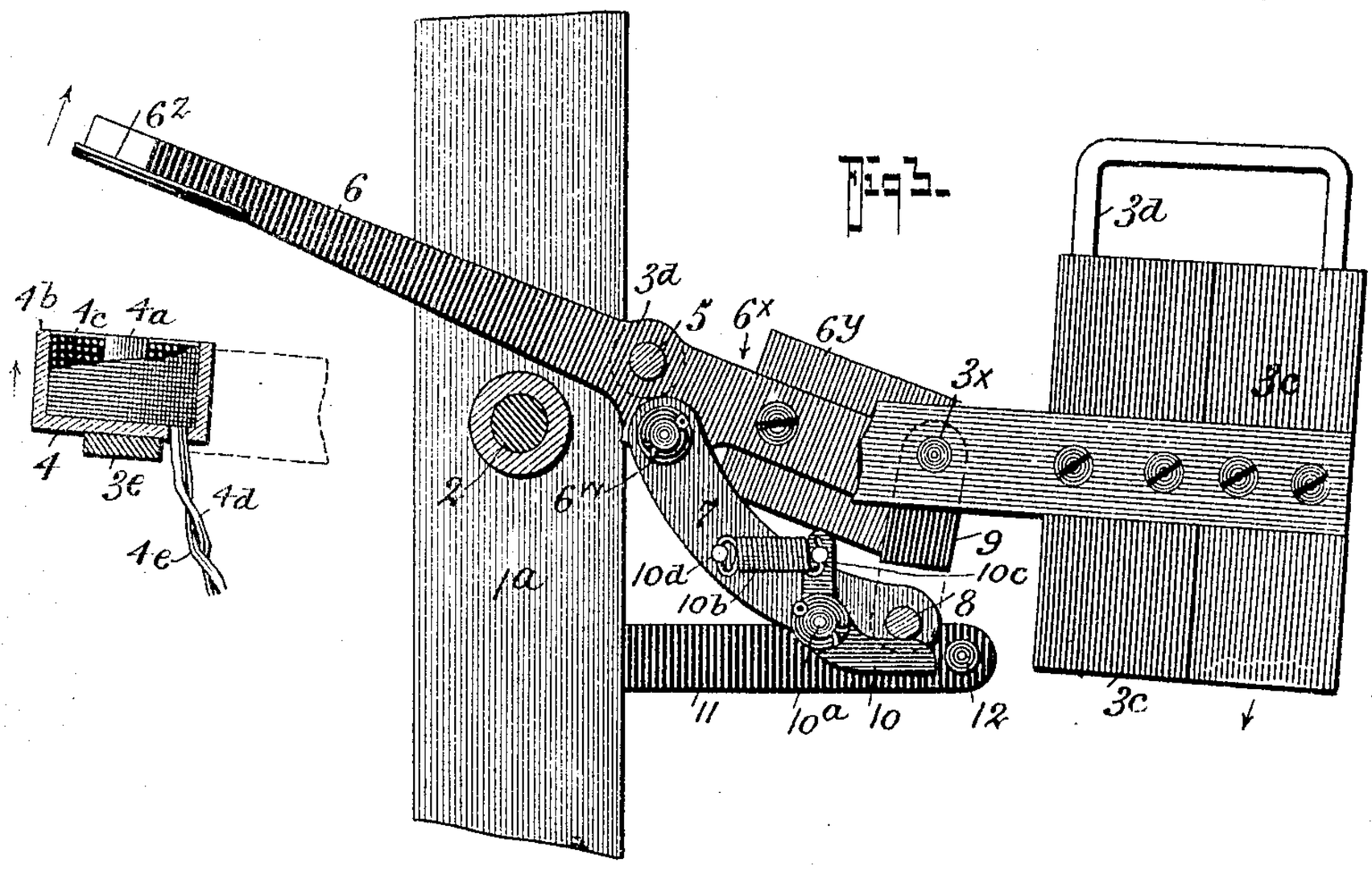
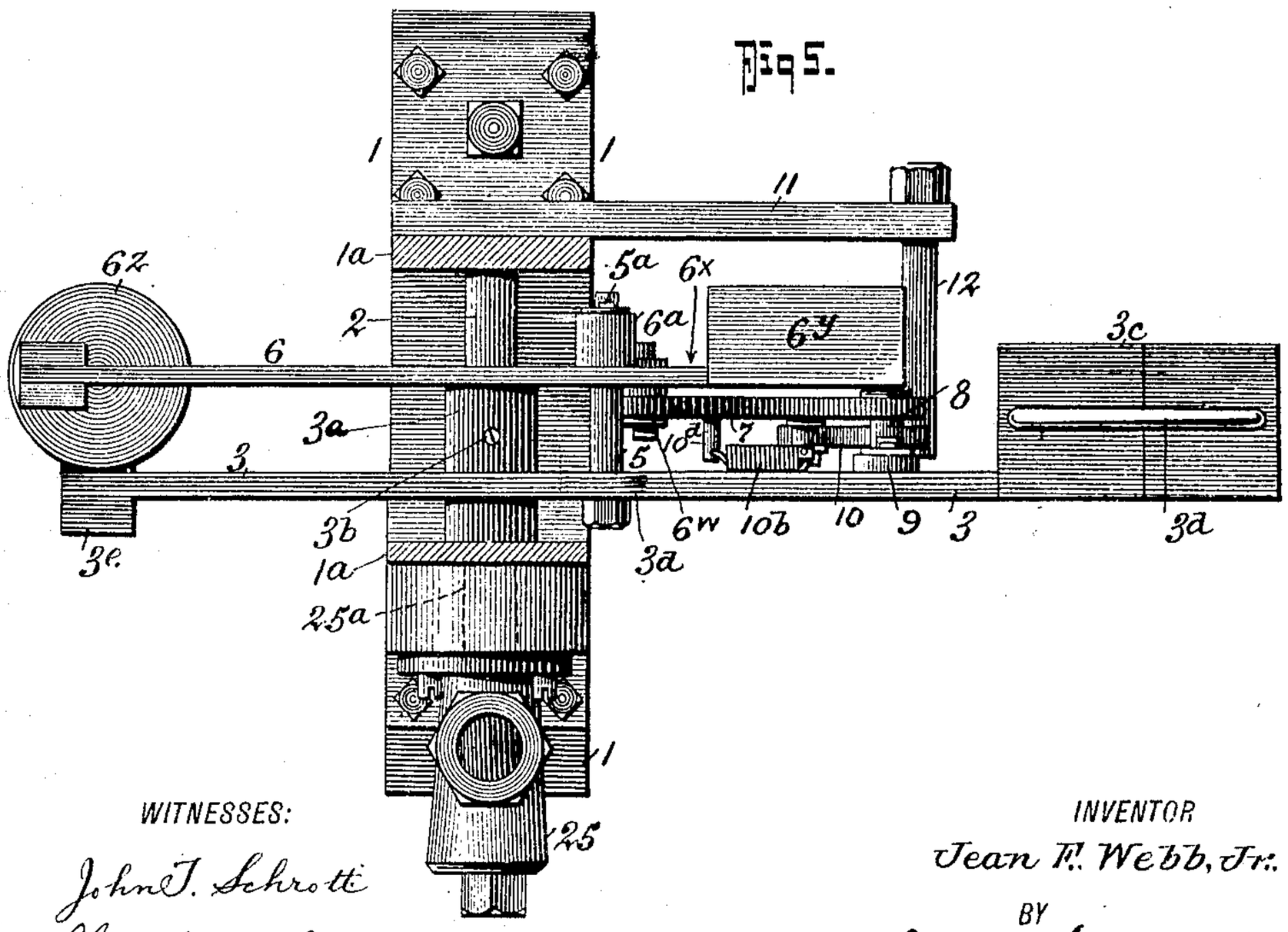


Fig. 5.



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4 SHEETS—SHEET 4.

Fig. 4.

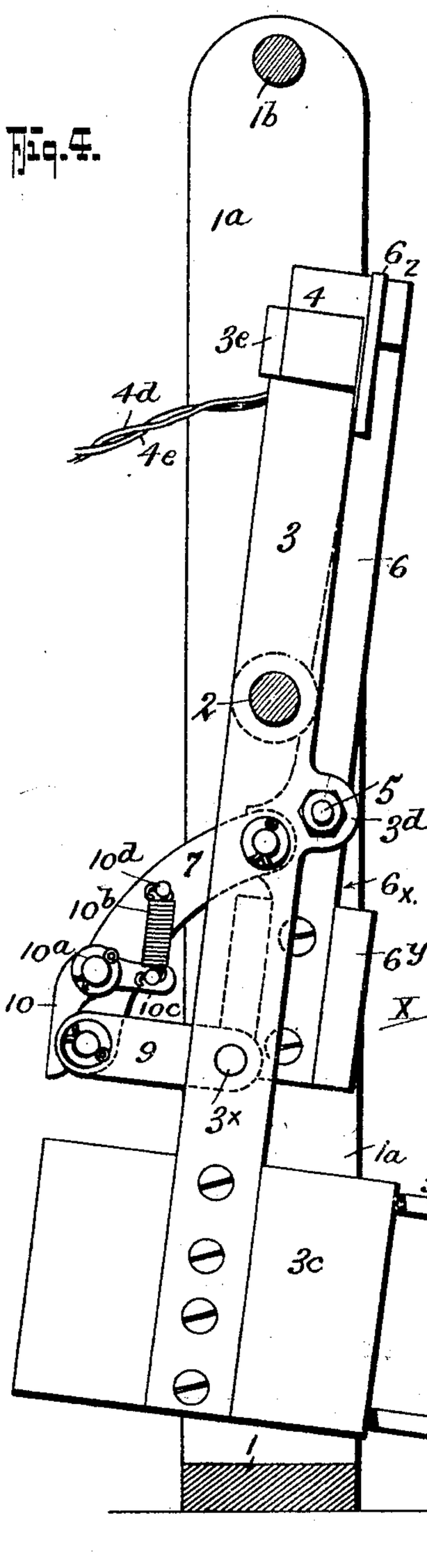


Fig. 7.

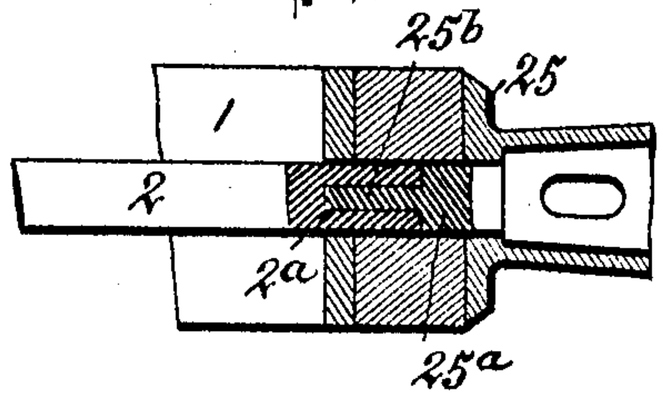
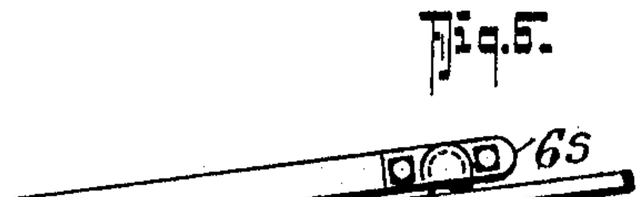


Fig. 5.



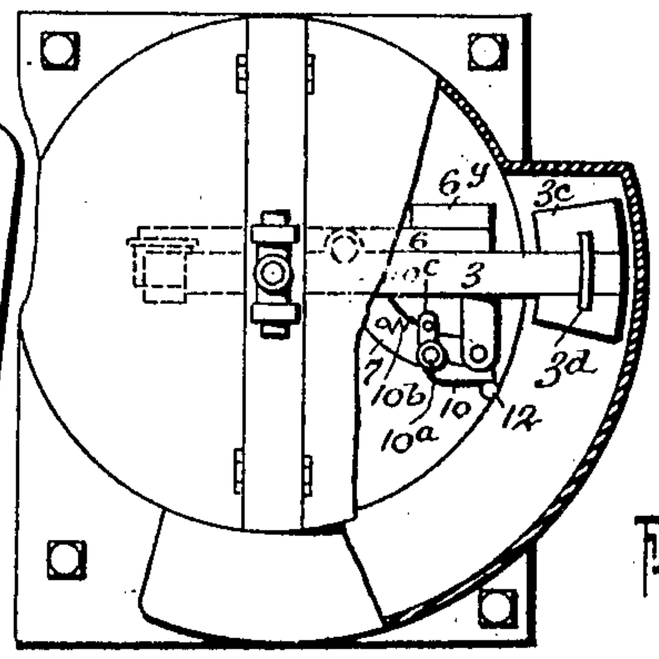


Fig. 8.

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UNITED STATES PATENT OFFICE.

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TRAIN-STOPPING MECHANISM.

No. 925,733. Specification of Letters Patent. Patented June 22, 1909.

Application filed October 15, 1908. Serial No. 457,930.

To all whom it may concern:

Be it known that I, JEAN F. WEBB, Jr., residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Train-Stopping Mechanisms, of which the following is a specification.

My invention relates to that class of train stopping mechanisms wherein the air valve in the air brake system of a train is automatically opened when the train is in danger, and in which electro-magnetic locking devices are provided to hold the valve normally closed and the valve opening mechanism inoperative.

Primarily this invention has for its object to provide a stopping mechanism of a magnet-locked gravity actuated type which will be simple in its construction, which will positively operate at the desired time, and which will require a minimum current to hold the mechanism locked.

More specifically my invention has for its object to provide a mechanism of the foregoing character operable in connection with closed circuit train stopping systems wherein when a break in the circuit occurs (either through an opening of a track circuit terminal switch, a semaphore switch or the breaking of a wire) the valve opening mechanism will be released to open the valve and set the air brakes, thus bringing the train to a stop.

The present invention embodies those novel details of construction, combination and arrangement of parts, all of which will be first described in detail, then be specifically pointed out in the appended claims, and illustrated in the accompanying drawings, in which:

Figure 1, is a perspective view of my invention, the parts being in their normal or locked position with the valve closed. Fig. 2, is a front elevation thereof. Fig. 3, is a detail elevation and part section showing the position of the parts just after the locking mechanism has been released and the valve mechanism beginning to operate. Fig. 4, is an elevation showing the position of the parts when the valve has been opened. Fig. 5, is a horizontal section on the line 5—5 of Fig. 2. Fig. 6, is a detail view of a modified connection between the armature and the locking lever. Fig. 7, is a detail view of the connection between the valve stem and the main shaft. Fig. 8, is a detail view showing the manner of inclosing my invention.

Referring now to the accompanying drawings, in which like characters of reference indicate like parts in all of the figures, from a suitable base 1, which may be bolted or otherwise secured to the locomotive or other part of the train, a pair of standards 1^a—1^a project upwardly. These standards are connected at their upper ends by a bolt 1^b which also forms a "distance piece" to hold the standards 1^a separated the required distance at the top.

The standards 1^a are provided with bearings in which a shaft 2 is journaled. Secured to one of the standards 1^a is the valve 25 which may be of the ordinary conductors' type and provided with a rotary stem 25^a that has a tenon 25^b to fit into the groove 2^a of the shaft 2 and form a continuation of such shaft so that the valve stem 25^a and the shaft 2 will turn together.

Secured to the shaft 2 to turn therewith is the valve opening lever 3 that is provided with an apertured hub 3^a through which the shaft passes. The lever 3 and its hub are keyed to the shaft 2 by a pin 3^b or otherwise so that the lever and shaft will turn as one. At one end the lever 3 carries a weight 3^c that is provided with a handle 3^d, by means of which the weight may be lifted to return the shaft 2 to its initial position to close the valve, as will be hereinafter more fully understood. At the other end the lever 3 is provided with a lateral projection 3^e upon which is mounted an iron-clad magnet 4, consisting of the core 4^a, the shell 4^b and the windings 4^c, from which the terminals 4^d—4^e respectively pass through an aperture in the shell 4 and to which terminals a closed electric circuit (not shown) is adapted to be connected.

The valve operating arm or lever 3 is provided with a lug 3^d to which a stub shaft 5 is secured, the shaft 5 projecting at substantially right angles to the arm or lever 3 and held in a plane above that containing the shaft 2 when the parts are in the position shown in Fig. 2, for a purpose which will be hereinafter more fully apparent. Upon the stub shaft 5 the locking lever 6 is pivoted, the locking lever 6 having a hub 6^a apertured to fit onto the stub shaft 5 and the lever is held in place on the stub shaft 5 by an ordinary

cotter-pin 5^a, or in any other suitable manner. The short end 6^x of the lever is weighted as at 6^y while the long end of the lever 6 is provided with the armature 6^z that cooperates with the magnet 4.

Pivoted on a stud 6^w that projects laterally from the lever 6 is a link 7 whose other end is pivoted at 8 to a second link 9 that is in turn pivoted at 3^x to the valve operating lever 3. The links 7 and 9 are spaced apart by the pivot 8 to admit of a latch 10 operating between the links 7 and 9. The latch 10 is pivoted at 10^a to a stud that projects from the link 7 and the latch 10 is held to abut the pivot bar 8 by a coil spring 10^b that is secured to the arm 10^c of the latch 10 and to a lug 10^d on the link 7.

11 designates an arm projecting to one side of the standards 1^a and secured rigidly to one of said standards. At the outer end the arm 11 has a stop 12 that is adapted to be engaged by the latch 10 when the parts are in their normal position, as shown in Figs. 1, 2 and 5 of the drawings.

Instead of securing the armature 6^z to the locking lever 6 in a rigid manner, as shown in Figs. 1 to 5 inclusive of the drawings, I may connect the armature 6^z with the lever 6 by a ball and socket joint 6^s, as shown in Fig. 6.

In the practical application of my invention I prefer to connect the valve 25 to the air brake system operatively in line with the engineer's valve and place the mechanism in some location on the engine difficultly accessible by the engineer but so that he can reset the same in a manner which will hereinafter be more fully understood.

Any suitable means may be provided for breaking the electric circuit to deënergize the magnet 4, and a detailed description thereof will not be necessary in this case.

Operation: Assume the parts to be in the position shown in Figs. 1 and 2, with the valve 25 closed and current flowing through the magnet 4 to energize the same. The magnet 4 being energized will retain its armature and hold the lever 6 in the locking position parallel with the lever 3, as shown in Figs. 1 and 2 of the drawings. As soon as a break in the electric circuit occurs the magnet 4 will be deënergized and will therefore release the armature 6^z. As soon as the armature 6^z has been released the weight 6^y turns the lever 6 on its pivot 6^a and draws the links 7 and 9 into the position shown in Fig. 3. The movement of the links 7 and 9, from the position shown in Fig. 1, to that shown in Fig. 3, causes the latch 10 to become released from the stop 12 and thereby permits the weight 3^c to come into action. The weight 3^c then moves the arm to the position shown in Fig. 4, which causes the shaft 2 and the valve stem 25 to turn, thus opening the valve 25 and permitting the air to exhaust to set the brakes in a manner well understood by those skilled in the art to which the invention appertains. In moving the shaft 2 the weight 3^c is aided by the weight 6^y and the members connecting the lever 6 with the lever 3. It is to be noted that the pivot or fulcrum of the lever 6 is not in alinement with the pivot of the lever 3, but is arranged so that when the parts are in the potion shown in Fig. 3, the pivot 6^a will be slightly above that of the shaft 2. This is done so that when the parts are in the position shown in Fig. 4, the weight 6^y will exert a force in the direction of the arrow X in Fig. 4, and hold the armature 6^y against the magnet 4, so that as soon as the magnet 4 is energized it will immediately retain the armature 6^z without the necessity of drawing it from afar. The opening of the valve 25, as before stated, sets the air brakes. In order to start the train, it is necessary for the engineer to obtain access to the train stopping mechanism, grasp the handle 3^d and lift the weight 3 into the position shown in Fig. 2. If the magnet 4 has become energized, it will hold the lever 6 in its locking position so that as the engineer raises the weight 3^c to bring the members into the position shown in Fig. 2, the latch 10 will pass the stop 12 until it rests upon it as shown in Fig. 2. However should the broken circuit not have been closed at the time the engineer attempts to reset the stopping mechanism the magnet 4 will be deenergized and hence any attempt to re-set the train stopping mechanism would result in a failure, as the weight 6^y will hold the latch 10 out of alinement with the stop 12, until the magnet 4 becomes energized again.

The entire mechanism shown in Figs. 1 to 7 of the drawings may be inclosed in a casing, as indicated in Fig. 8, and when inclosed in a casing, the shaft 2 is journaled in bearings in the casing walls and the fixed stop 12 is projected from one of the casing walls. In this form the casing walls correspond in purpose and function to the standards 1^a and to the arm 11 which carries the stop 12 in the form shown in Figs. 1, 2 and 3, of the drawings.

Of course I desire it understood that I do not wish to be limited to the exact structural features herein described and disclosed in the drawings, as various modifications may be made without departing from the spirit of the invention or the scope of the appended claims.

From the foregoing description taken in connection with the accompanying drawings, it is thought the complete construction, operation and advantages of my invention will be readily understood by those skilled in the art to which the invention appertains.

What I claim is:

1. In an apparatus of the class described, a rotatable shaft, a weighted actuating lever

carried thereby to turn the shaft in one direction, a weighted locking lever pivoted to said actuating lever, electro-magnetic means carried by said levers for normally holding the same in one position, a latch mechanism supported by said levers and a fixed stop to cooperate with said latch mechanism to hold said actuating lever from operation at times.

2. In an apparatus of the class described, a rotatable shaft, a weighted actuating lever carried thereby to turn the shaft in one direction, a weighted locking lever pivoted to said actuating lever, electro-magnetic means carried by said levers for normally holding the same in one position, a latch mechanism, a fixed stop to be engaged by said latch to hold the operating lever in one position, and means for releasing said latch from said fixed stop when the locking lever is released.

3. In an apparatus of the class described, a rotatable shaft, a weighted actuating lever carried thereby to turn the shaft in one direction, a weighted locking lever pivoted to said actuating lever, electro-magnetic means carried by said levers for normally holding the same in one position, a latch mechanism, a fixed stop to be engaged by said latch to hold the operating lever in one position, means for releasing said latch from said fixed stop when the locking lever is released, said last named means comprising a link connected to said locking lever, said latch being mounted on said link.

4. In an apparatus of the class described, a rotatable shaft, an actuating lever carried thereby to turn the shaft, a locking lever pivoted to said actuating lever, electro-magnetic means for normally holding said levers in one position, a latch mechanism coöperating with said levers, and a fixed stop to be engaged by said latch mechanism to hold said actuating lever from operation while under the influence of the electro-magnetic means.

5. In an apparatus of the class described, a rotatable shaft, a weighted actuating lever carried thereby to turn the shaft in one direction, a weighted locking lever pivoted to said actuating lever, electro-magnetic means carried by said levers for normally holding the same in one position, a latch mechanism supported by said levers and a fixed stop to coöperate with said latch mechanism to hold said actuating lever from operation at times, and an air brake valve having a stem interengaged with said rotatable shaft to turn therewith.

6. In an apparatus of the class described, a rotatable shaft, a weighted actuating lever carried thereby to turn the shaft in one direction, a weighted locking lever pivoted to said actuating lever, electro-magnetic means carried by said levers for normally holding the same in one position, a latch mechanism, a fixed stop to be engaged by said latch to hold the operating lever in one position, means for releasing said latch from said fixed stop when the locking lever is released, and an air brake valve having a stem interengaged with said rotatable shaft to turn therewith.

7. In an apparatus of the class described, a rotatable shaft, a weighted actuating lever carried thereby to turn the shaft in one direction, a weighted locking lever pivoted to said actuating lever, electro-magnetic means carried by said levers for normally holding the same in one position, a latch mechanism, a fixed stop to be engaged by said latch to hold the operating lever in one position, means for releasing said latch from said fixed stop when the locking lever is released, said last named means comprising a link connected to said locking lever, said latch being mounted on said link, and an air brake valve having a stem interengaged with said rotatable shaft to turn therewith.

8. In an apparatus of the class described, a rotatable shaft, an actuating lever carried thereby to turn the shaft, a locking lever pivoted to said actuating lever, electro-magnetic means for normally holding said levers in one position, a latch mechanism coöperating with said levers, a fixed stop to be engaged by said latch mechanism to hold said actuating lever from operation while under the influence of the electro magnetic means, and an air brake valve having a stem interengageable with said rotatable shaft to turn therewith.

9. In an apparatus of the class described, a rotatable shaft, a rotatable air valve connected to said shaft, a weighted actuating lever carried by said shaft to turn the shaft, a locking lever pivoted to said actuating lever, electro-magnetic means for holding said locking lever in one position, a latch mechanism coöperatively connected with said locking lever and said actuating lever for holding said levers in one position, and means for turning said locking lever on its pivot when the electro-magnetic holding means becomes inoperative.

10. In an apparatus of the class described, a rotatable shaft and a valve mechanism connected therewith to be actuated thereby, an actuating lever carried by said shaft, means for moving said actuating lever in one direction at times, a locking mechanism carried by the actuating lever, a fixed stop coöperating with the locking mechanism to hold the actuating lever in one position, means for releasing said locking mechanism at times to release said actuating lever to turn the shaft.

11. In an apparatus of the class described, a rotatable shaft, an actuating lever carried thereby, a locking lever carried by the actuating lever, a latch carried by the locking

and actuating levers, a fixed stop to be engaged by said latch at times to hold the actuating lever in one position when the locking lever is locked, and electro-magnetic means for holding the locking lever in its locked position.

12. In an apparatus of the class described, a rotatable shaft, an actuating lever carried thereby, a locking lever carried by the actuating lever, a latch carried by the locking and actuating levers, a fixed stop to be engaged by said latch at times to hold the actuating lever in one position when the locking lever is locked, electro-magnetic means for holding the locking lever in its locked position, and means carried by the locking lever which when the locking lever is released will withdraw the latch from the fixed stop and release the actuating lever.

13. In an apparatus of the class described, a rotatable shaft, an actuating lever carried thereby, a locking lever carried by the actuating lever, a latch carried by the locking and actuating levers, a fixed stop to be engaged by said latch at times to hold the actuating lever in one position when the locking lever is locked, electro-magnetic means for holding the locking lever in its locked position, means carried by the locking lever which when the locking lever is released will withdraw the latch from the fixed stop and release the actuating lever, and means for moving the actuating lever when released to turn the shaft.

14. In an apparatus of the class described, a rotatable shaft, an actuating lever carried thereby, a locking lever carried by the actuating lever, a latch carried by the locking and actuating levers, a fixed stop to be engaged by said latch at times to hold the actuating lever in one position when the locking lever is locked, electro-magnetic means for holding the locking lever in its locked position, means carried by the locking lever which when the locking lever is released will withdraw the latch from the fixed stop and release the actuating lever, means for moving the actuating lever when released to turn the shaft, said last named means comprising a weight carried by the actuating lever and operating under the influence of gravity.

15. In an apparatus of the class described, a rotatable shaft, an actuating lever carried thereby, a locking lever carried by the actuating lever, a latch carried by the locking and actuating levers, a fixed stop to be engaged by said latch at times to hold the actuating lever in one position when the locking lever is locked, electro-magnetic means for holding the locking lever in its locked position, means carried by the locking lever which when the locking lever is released will withdraw the latch from the fixed stop and release the actuating lever, means for moving the actuating lever when released to turn the shaft, said last named means comprising a weight carried by the actuating lever and operating under the influence of gravity, said electro-magnetic means comprising an electro-magnet carried by one of said levers and an armature carried by the other lever.

16. In an apparatus of the class described, a rotatable shaft and a valve operable thereby, an actuating lever carried by the shaft for turning the same, a weight on one end of said lever, an electro-magnet supported on the other end of said lever, a locking lever pivotally mounted on said actuating lever, an armature carried by one end of said locking lever to coöperate with the electro-magnet, a weight on the other end of said locking lever, link connections between the locking and actuating levers, a latch mounted on said link connections, a fixed stop to be engaged by said latch at times, all being arranged so that when the electro-magnet is energized the locking lever will hold the latch in engagement with the fixed stop and when the magnet is deënergized the locking lever will withdraw the latch from the fixed stop to permit the actuating lever weight to move the actuating lever under the influence of gravity to rotate said shaft and open the valve.

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