H. G. SEDGWICK.

VENT VALVE FOR AUTOMATIC TRAIN STOPS.

APPLICATION FILED JUNE 29, 1907.

900,214. Patented Oct. 6, 1908.

Fig. 2.

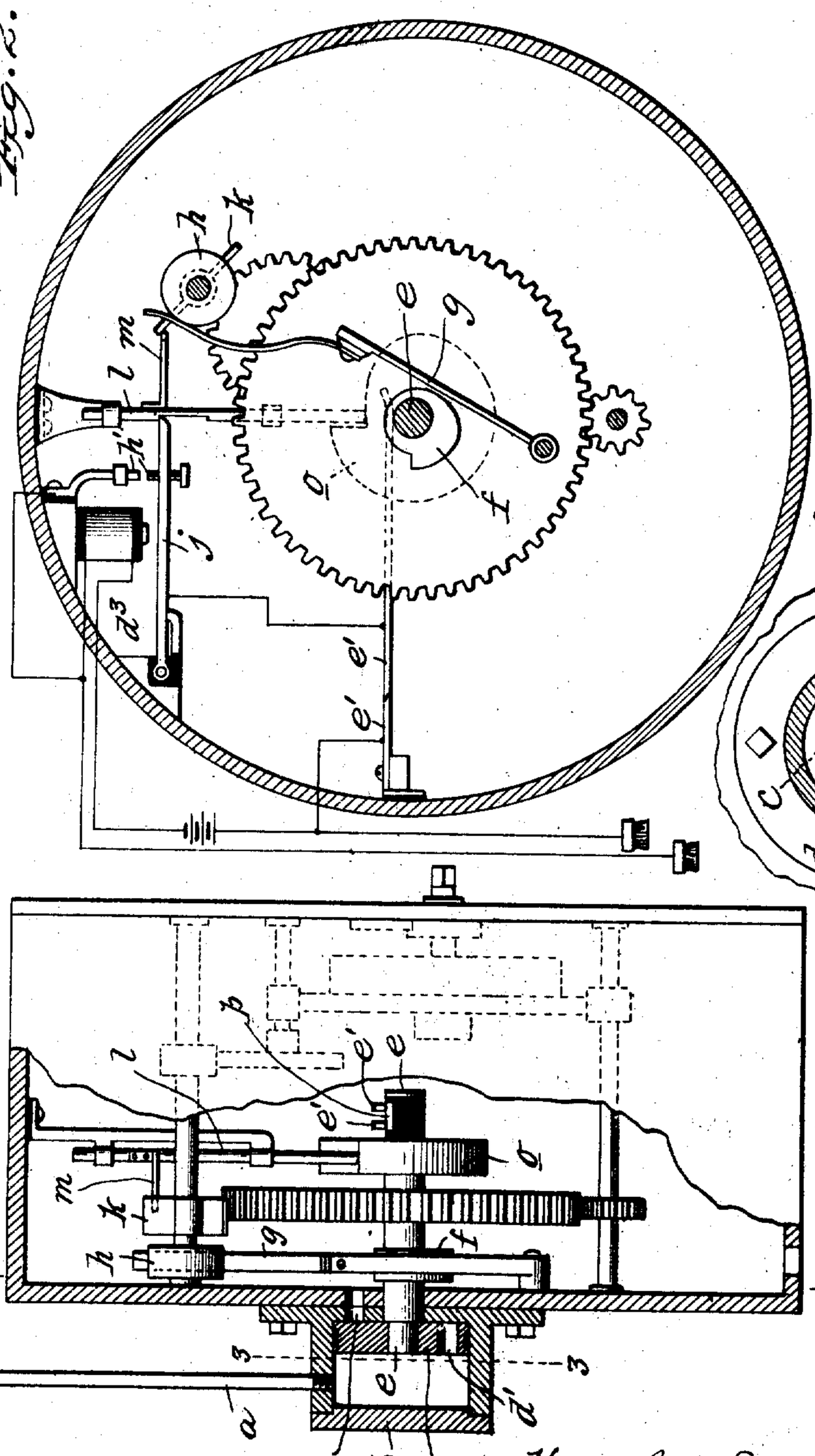

Fig. 1.

Fig. 3.

Witnesses
Edwin F. Frey
A. B. Ridgeway

Inventor,
Hiram G. Sedgwick,
By Davis & Davis,
Attorneys.

UNITED STATES PATENT OFFICE.

HIRAM G. SEDGWICK, OF MILL VALLEY, CALIFORNIA.

VENT-VALVE FOR AUTOMATIC TRAIN-STOPS.

No. 900,214. Specification of Letters Patent. Patented Oct. 6, 1908.

Application filed June 29, 1907. Serial No. 381,467.

To all whom it may concern:

Be it known that I, HIRAM G. SEDGWICK, a citizen of the United States of America, and a resident of Mill Valley, county of Marin, State of California, have invented certain new and useful Improvements in Vent-Valves for 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 vertical sectional view of a suitable clockwork motor provided with my invention; Fig. 2 a vertical section on the line 2—2 of Fig. 1; and Fig. 3 a vertical section on the line 3—3 of Fig. 1.

This invention has reference to that class of vent valves for automatic train-stopping systems covered by my former patents No. 757,571, dated April 19, 1904, and No. 794,320, dated July 11, 1905, in which suitable automatic mechanism is provided for venting the train-pipe and applying the brakes, this mechanism being adapted to be set in motion by suitable means on the roadbed.

The object of the present invention is to provide absolutely against an emergency application of the brakes and also insure a full and complete quick-action application of the brakes whatever be the length of the train with but a single operation of the vent valve, as more fully hereinafter set forth.

Referring to the drawings by reference characters, *a* designates a portion of the train-pipe of the air-brake mechanism which is connected to a valve chest *b* having an outlet port *c*, this port being controlled by a circular rotatable valve *d* which is attached to the shaft *e* of a suitable clockwork motor. This valve *d* is provided with an elongated port *d'* circular in form and concentric with the shaft *e*, the forward end-portion d^2 of this port being abruptly narrowed down to a slit while the main portion of the port is sufficiently wide to entirely uncover the escape port *c* when it passes over said escape port in the rotation of the valve.

On the shaft *e* is mounted a cam *f*, this cam being so shaped that at a predetermined point in the rotation of the shaft it will bear against a brake lever *g* and cause said lever to press upon the periphery of the brake wheel *h* mounted on one of the shafts of the motor, preferably the shaft carrying the fan *k*. Any suitable devices may be employed for stopping and starting the clock mechanism. One suitable arrangement is shown in my co-pending application, serially numbered 376,857, in which electrical devices are covered whereby the motor is released electrically when the brushes or other current-collectors on the locomotive are electrically connected. These devices consist essentially of a vertical gravitating rod *l* carrying an arm *m* adapted when the rod is down to engage the fan and stop the motor. This rod *l* rests upon the cam *o* mounted on the shaft *e* and it is lifted by an armature *j* which armature carries one of a pair of contacts *h'* and is lifted by a magnet d^3 which magnet is energized when the brushes on the locomotive are electrically connected, the armature being held up until the circuit is broken by the passage off the metal connecting plate *p* of a pair of contact fingers *e'*, said contact plate being insulatedly carried on the shaft *e*.

The cam *o* provides for holding up the rod *l* away from the fan after the armature lever is dropped through the breaking of its circuit and until an entire revolution of the valve shaft *e* is obtained; when a full revolution is obtained the rod *l* drops off the shoulder of the cam and stops the fan.

It will be observed that when the motor is released the valve will be given a single rotation in the direction of the arrow shown in Fig. 3. The slit or narrow portion of the valve port will first pass over and partially uncover the escape port and then the wider portion will wholly uncover. The cam *f* will be so designed that at the instant the wider portion of the port reaches the escape port the cam will press upon the brake lever and instantly slow down the mechanism so that during the remaining movement of the valve it will move slower than during the initial movement. In other words the cam and brake lever are so arranged and shaped that any desired differential movement of the valve can be obtained so as to thereby provide for applying the brakes in a manner as nearly as possible similar to a perfect manual application of the brakes through the medium of the engineer's control valve. With the construction shown the narrow forward end of the valve port will be caused to quickly move across the escape port and thus obtain the desired reduction in train pipe pressure to set all the triple valves but this reduction will only be sufficient, say five pounds, to give a service application of the brakes as distinguished from an emergency

application, which latter is impossible with this apparatus and is to be avoided, as is well known, by reason of the injurious consequences to the rolling stock of such an application of the brakes.

By varying the length, and width of the narrowed portion of this port any desired preliminary reduction in pressure can be obtained, and when this preliminary application of the brakes is obtained the valve is slowed down while the wider portion of the port passes over the outlet and thus a full reduction in pressure is obtained. The slowing down of the valve insures a full application of the brakes with a single rotation of the valve. As is obvious, by varying the shape of the cam any reduction in the speed of the rotation of the valve can be secured so that it will be a simple matter to adapt the apparatus for use on trains of any length. For instance, on the large freight engines which are employed for hauling very long freight trains employing a great many feet of train-pipe and many triple valves the cam will be so shaped as to obtain a very slow movement of the valve, so that even with trains of the greatest length a single rotation of the valve will cause a complete or full application of the brakes throughout the train. I contemplate employing either an adjustable cam which may be readily varied as to length of operating face or a series of removable cams any one of which may be placed on the shaft as may be required by the number of cars the locomotive usually hauls. It is obvious also that the cam may be variously shaped in order to obtain any desired differential movement of the valve.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In combination with a train-pipe, of a vent-valve therefor and a motor for operating said vent-valve, this motor embodying means for giving to the valve a differential movement, whereby a quick preliminary partial reduction and a subsequent full reduction of pressure is obtained with but a single action of the valve.

2. In combination with a train-pipe and air-brake system, a vent-valve therefor having an elongated port whose forward end is abruptly narrowed, and a differential motor mechanism for said valve, for the purpose set forth.

3. In combination with a train-pipe and air-brake system, a vent-valve therefor having an elongated port whose forward end is abruptly narrowed, and a differential motor mechanism for said valve, said motor mechanism being constructed to give an initial quick movement and a subsequent slower movement, for the purpose set forth.

4. In combination with a train-pipe of an air-brake system, a vent-valve therefor having an elongated port, and automatic mechanism for actuating said valve quickly during a part of its movement and slowly during another part of its movement, for the purpose set forth.

5. In combination with a train-pipe of an air-brake system, of a vent-valve therefor having an elongated port, a clock mechanism for actuating the valve a full stroke with each actuation and then stopping it, said mechanism embodying automatic braking means for retarding the movement of the valve during a portion of its stroke.

6. In combination with a train-pipe of an air-brake system, of a vent-valve therefor circular in shape and provided with a circular port having its forward end narrowed whereby the actuation of the valve will permit a preliminary partial reduction of pressure, and mechanism for automatically rotating this valve quickly during the time the narrowed portion is in action and at a slower speed while the wider portion is in action.

7. In a train stopping apparatus, the combination of an electrical circuit whose terminals are connected respectively to current collectors on the locomotive, a magnet in this circuit, an armature for this magnet, a shunt circuit including this armature and adapted to close when the armature is attracted, and motor mechanism automatically breaking the shunt circuit, for the purpose set forth.

8. In an apparatus of the class set forth, a main circuit on the locomotive whose terminals are connected respectively to current collectors on the locoomtive, a magnet and separable contacts in this circuit, a shunt circuit including an armature adapted to be attracted by said magnet and close the shunt circuit, and motor mechanism adapted to be released by the closing of the shunt circuit by said armature, said mechanism being adapted to operate the braking and signaling means and embodying means for opening and closing the main circuit with each operation.

9. In combination with a locomotive, of a main circuit whose terminals are connected with means for making two contacts with devices on the roadbed, a magnet in this circuit, an armature for this magnet, motor mechanism adapted to actuate the train braking and signaling devices and to be released by the attraction of said armature, and electrical means for maintaining energization of the magnet after the main circuit is broken on the roadbed, whereby the motor mechanism will continue to operate after the main circuit is thus broken on the roadbed.

10. In combination with a locomotive carrying a main circuit whose terminals are adapted to make contact with roadbed devices to complete the circuit, a magnet in said circuit, motor mechanism for operating

the braking or signaling devices, an armature for said magnet and means whereby this armature releases the motor mechanism, and means whereby the continued operation of the motor mechanism releases said armature and stops the motor mechanism.

11. In combination with a locomotive carrying a partial circuit whose terminals are connected with devices adapted to make contact with roadbed devices, said circuit including a magnet and a source of current, a shunt circuit including said source of current and said magnet, an armature for the magnet adapted when attracted to close said shunt circuit, motor mechanism for operating the braking or signaling devices, and means whereby said motor mechanism is released when the armature is attracted, and means whereby the continued operation of the motor mechanism breaks the shunt circuit, thereby releasing the armature.

In testimony whereof I hereunto affix my signature in the presence of two witnesses this 24th day of June 1907.

HIRAM G. SEDGWICK.

Witnesses:

S. H. ROBERTS,

WM. BURLINGAME.