A. M. JONES.

COMBINED SIGNAL AND AIR BRAKE.

APPLICATION FILED FEB. 10, 1909.

941,259.

Patented Nov. 23, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

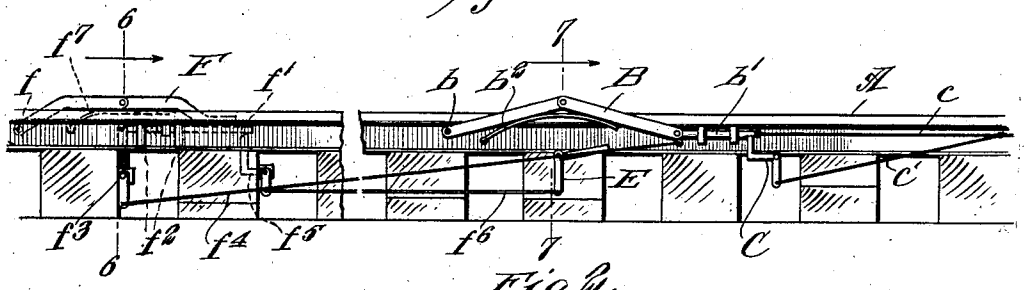


Fig. 2.

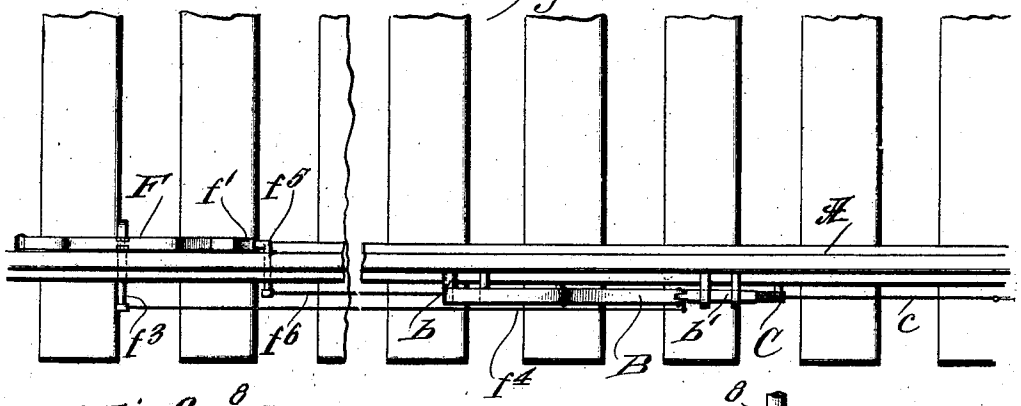


Fig. 3.

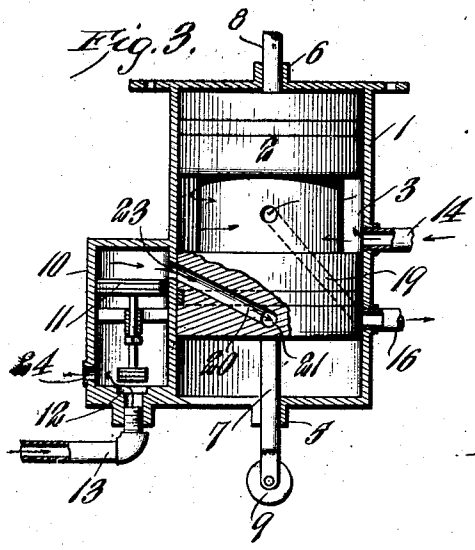
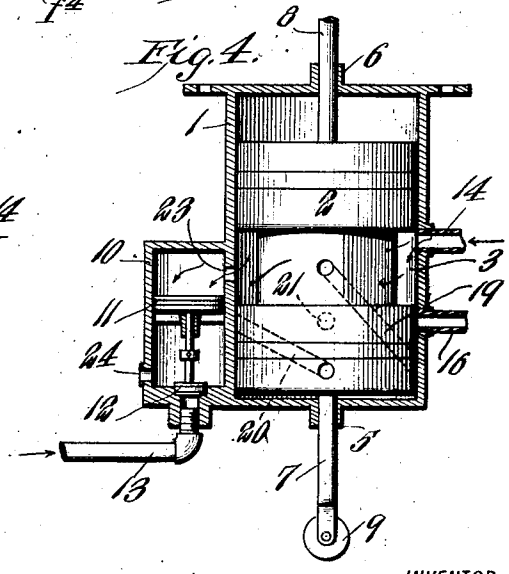


Fig. 4.



WITNESSES

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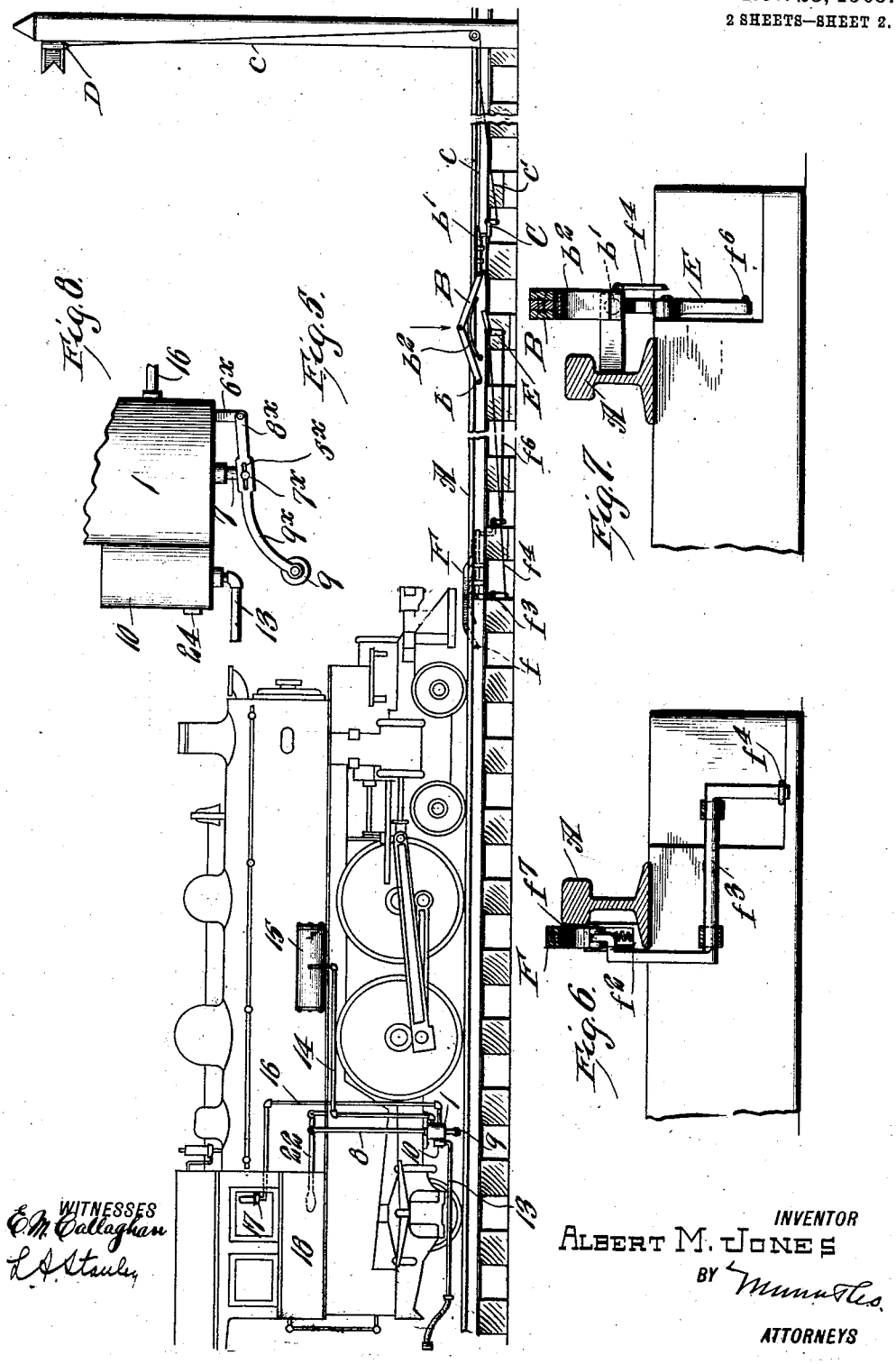
2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ALBERT M. JONES, OF HAGERSTOWN, MARYLAND, ASSIGNOR OF ONE-FOURTH TO GEORGE C. SNYDER AND ONE-FOURTH TO OTHO M. SNYDER, OF HAGERSTOWN, MARYLAND.

COMBINED SIGNAL AND AIR-BRAKE.

941,259. Specification of Letters Patent. **Patented Nov. 23, 1909.**

Application filed February 10, 1909. Serial No. 477,070.

To all whom it may concern:

Be it known that I, ALBERT M. JONES, a citizen of the United States, and a resident of Hagerstown, in the county of Washington and State of Maryland, have made certain new and useful Improvements in a Combined Signal and Air-Brake, of which the following is a specification.

My invention relates to means for automatically operating the air brakes and for sounding an alarm and it consists in the combinations, constructions and arrangements hereinafter described and claimed.

An object of my invention is to provide devices by which the brakes may be automatically set and the alarm sounded, said devices being located alongside of the track upon which the train is running.

A further object of my invention is to provide a novel controlling valve especially designed to work in connection with the brake mechanism.

A further object of my invention is to provide means actuated by the moving train or engine itself for positively setting the valve operating device in position in case of failure of the latter to work.

Other objects and advantages will appear in the following specification and the novel features of the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a portion of the track equipped with the valve operating devices. Fig. 2 is a plan view of the mechanism shown in Fig. 1. Fig. 3 is a detail sectional view of the controlling valve mechanism. Fig. 4 is a similar view showing the mechanism in a different position. Fig. 5 is a side view of a locomotive equipped with my brake controlling device on a track provided with devices for operating the same. Fig. 6 is an enlarged section taken along the line 6—6 of Fig. 1, looking in the direction of the arrow, and Fig. 7 is an enlarged section taken along the line 7—7 of Fig. 1. Fig. 8 is a view of a modified form of mechanism for operating the main controlling valve.

My invention is an improvement over a similar one set forth in my prior patent No. 905,080 of November 24, 1908. As before stated the main object of my invention is to provide a controlling valve located on a locomotive and operated by track devices for sounding an alarm and for setting the air brakes. To this end I provide the track A with a hinged device B, which is secured at one end b and is pivotally connected at the other to a slide rod b'. The hinged member is provided with a spring b^2 which normally tends to keep the former in a raised position. At the end of the rod b' is a locking device C in the shape of a bell crank lever, which is attached by means of a cord or wire c' to a similar flexible cord or wire c attached to the semaphore D. On the under side of the hinged device B is a bell crank lever E whose upper arm is adapted to raise the member B.

At the left of Figs. 1 and 2 is shown a device which coöperates with the hinged member B to actuate the latter when the signal D is properly set. It consists of a hinged member F of a form somewhat similar to that of the device B. It does not, however, extend as far up, being only slightly above the rail top and is designed to be operated by the flange of the wheel and not by the tread. The member F is pivoted at f and its free end is arranged to bear upon a pivoted rod f'. The latter is arranged for longitudinal sliding movement in the guides f^2, see Fig. 1. The lever f^3, see Fig. 6, has one end pivotally attached to the rod f' and the other end is connected by means of a flexible cord or wire f^4 to the end of the hinged member B. At the forward end of the rod f' is a bell crank lever f^5 arranged to be engaged by the rod f' as the latter is forced downwardly. A short thrust rod f^6 is attached to the lower end of the bell crank lever f^5 and to the bell crank lever E, so that when the former is operated the latter is also operated. The spring f^7 keeps the hinged member F in a normally raised position.

The controlling valve for the brake and signal operating devices is shown in detail in Figs. 3 and 4. It consists of an outer cylindrical casing 1, within which is located a piston 2. The central portion of this piston has an annular groove or channel 3. The lower and upper ends of the casing have central openings 5 and 6 respectively, the

stem 7 passing through the former and the stem 8 through the latter. The downwardly projecting stem 7 has at its end a roller 9 and constitutes a tappet which is adapted to be operated by the hinged member B in the manner hereinafter explained.

On one side of the main casing is a smaller casing 10 having a piston 11 arranged to operate a valve 12. The pipe 13 leads to the main air pipe of the train line. The pipe 14 communicates with the main air reservoir 15, see Fig. 1. The pipe 16 leads to a special signal device, in this case a whistle 17, in the cab 18 of the engine. The ducts 19 and 20, see Figs. 3 and 4, are bored straight through the piston 2, the former leading from the outer surface of the lower part of the piston and terminating at the central channel 3 and the latter being bored from one side to the other of the lower part of the piston 2 and having one end arranged to register with an opening 21 in the casing 1, leading to the outer atmosphere.

The valve stem 8 is connected with a lever 22 in the cab, by which the valve may be forced downwardly into its original position after once being operated.

From the foregoing description of the various parts of the device the operation thereof may be readily understood. In the normal operation of the railroad system, the brake setting and signaling devices would not be used. Under these conditions the cord c would be drawn forward by the signal operator and held. It will be seen on reference to the drawings that the locking member C would be drawn out of position, the slide member b' would be drawn forwardly and the hinged member B would be drawn downwardly out of its operating position. At the same time the cord or wire f^4, which is attached to the hinged member B would pull on the lever f^3, thereby sliding the rod f' backward and out of engagement with the bell crank lever f^5. Now when a locomotive comes along the member F would be depressed but the pivoted rod f' would be drawn away from the end of the lever f^5 and therefore would simply ride up and down without affecting it. The hinged member B also being down would not be affected by the passage of the locomotive. In case a rail is broken or an accident has occurred and the signal operator wishes to stop the train, he releases the cord or wire C by setting the signal in the proper position. The spring b now raises the hinged member B in the position shown in Fig. 5. At the same time the rod f' is thrust forward in a position over the lever f^5. Now when a train approaches the flange of the front wheels will bear down on the hinged member F and swing the front end of the hinged member f' downwardly and through its engagement with the lever f^5 cause a movement of the bell crank lever E, whose free arm will swing upwardly. The purpose of the device f' is to provide a positive actuating member for the hinged member B so as to cause the positive forcing up of the latter before the train reaches it, in case it should be accidentally held down by snow or ice or for any other reason. When the roller 9 reaches the hinged member B, the latter, which is locked, will cause the roller to ride over the inclined surfaces, thereby causing an upward movement of the valve 2.

Fig. 4 shows the lower position of the valve. In this figure it will be observed that the pipe 14 leading from the main air reservoir 15 communicates directly with the annular space 3. The air pressure in the main reservoir is approximately one hundred pounds. The channel 3 is in communication with the interior of the cylinder 10 by means of the port 23 and therefore the valve 12 is held down by the piston 11 with an excess pressure of thirty pounds, since the pressure in the train pipe 13 is approximately seventy pounds. Now as the tappet 7 is pushed up carrying the valve with it, the parts are brought into the position shown in Fig. 3, in which it will be seen that the duct 20 is brought into registration with the port 23 and the outlet 21, thereby relieving the piston 11 of the pressure on its upper side when the pressure on the lower side of the valve will force it open and permit the escape of the air from the train pipe 13 through the port 24 in the cylinder 10, thus operating the brakes and bringing the train to a standstill. At the same time the duct 19 is brought into registration with the pipe 16 leading to the whistle 17 in the cab of the engine and the latter is therefore sounded by means of the air coming from the main reservoir. The whistle will continue to sound until the piston 2 is again forced downwardly, which may be done by means of the lever 22 in the cab.

It will thus be seen that the train may be brought to a standstill by the automatic action of the track devices B and F when the latter are set in position by the operator.

In Fig. 8 I have shown a modified means for operating the main controlling valve. In this construction the valve stem 7 is provided with a pin 7^x on its lower extremity adapted to slide in a slot 5^x of an arm or lever 9^x, pivoted at 8^x to a downwardly depending arm 6^x attached to the valve casing. The roller 9 is on the downwardly curved end of the lever 9^x. When the latter is engaged the lever is forced upwardly and communicates its motion to the valve stem. One advantage in this form is that as the train is proceeding, the force on the wheel 9 is partly a lateral force, thereby tending to push the wheel toward one side. The arrangement just described will permit a con-

siderable impact upon the wheel without tending to force the valve stem against its guides or of injuring the latter.

I claim—

1. In a train controlling means, a casing connected to the train pipe and to the main air reservoir, a signal, a piston in said casing having a downwardly projecting tappet and means arranged on the track for engaging said tappet to cause the opening of the train pipe and the connection of the signal with said main air reservoir.

2. In a train controlling means, a casing connected to the train pipe and to the main air reservoir, a whistle, a piston provided with ducts in said casing having a downwardly projecting rod constituting a tappet, means arranged on the track for engaging said tappet to force said piston upwardly into position to cause the opening of the train pipe and the connection of the whistle with said main air reservoir.

3. In a train controlling means, a whistle, a main casing connected to the main air reservoir, an auxiliary casing communicating with said main casing and with the train pipe, a valve in said auxiliary casing, a piston provided with ducts in said main casing, a tappet connected to said piston, and means arranged on the track for engaging said tappet to force said piston upwardly to bring one of said ducts into communication with the main air reservoir and the whistle and the other of said ducts into communication with the interior of the auxiliary casing and the atmosphere, thereby permitting the train pipe valve to open.

4. In a train controlling means, a whistle, a main casing communicating with the main air reservoir, a piston disposed in said main casing provided with an annular channel and having ducts, an auxiliary casing communicating with said main casing and with a train pipe, a piston in said auxiliary casing, a train pipe valve actuated thereby, a tappet arranged to force said piston upwardly to bring one of said ducts into position for relieving the pressure on the train pipe valve, thereby causing the opening of the same and the other duct into position for establishing communication between the main air reservoir and the whistle, thereby causing the sounding of the latter, and means on the track for engaging said tappet.

5. In a train controlling means, a whistle, a main casing, a piston located therein provided with a central annular channel and having ducts, a pipe leading from said casing to the main air reservoir, a second pipe leading from the casing to the whistle, an auxiliary casing communicating with the interior of said main casing, a piston disposed in said auxiliary casing, a valve attached thereto arranged to control the pressure in the train pipe, a tappet secured to said channeled piston and arranged when actuated to cause one of said ducts to establish communication between the interior of the auxiliary casing and the atmosphere, thereby relieving the pressure on the train pipe valve and causing the latter to open, and the other of said ducts to establish communication between the main air reservoir and the whistle to cause the sounding of the latter.

6. In a train controlling means, a whistle, a main casing, a piston in said main casing having a central annular channel and provided with ducts, an auxiliary casing communicating with the interior of said main casing, a piston within said auxiliary casing, a valve secured to said piston and arranged to control the train pipe, means for establishing communication between the main air reservoir and the auxiliary casing for holding the train pipe valve closed, a tappet arranged to cause the movement of the piston to bring the interior of the auxiliary casing in communication with the outer atmosphere thereby relieving the pressure on the valve and opening the train pipe for bringing the main air reservoir into communication with the whistle and thereby sounding the latter, means arranged on the track for actuating said tappet, and means for putting the tappet actuating mechanism into or out of operative position.

7. In a train controlling means, a whistle, a main air reservoir, a train pipe, a main casing communicating with said train pipe and said main air reservoir, a main piston carried by said casing and provided with a tappet, a spring actuated track device arranged to engage said tappet to force said piston upwardly, means for locking said track device in its operative position and auxiliary means on the track for causing the positive operation of said spring actuated track device.

ALBERT M. JONES.

Witnesses:
EDWARD KUHLMAN,
S. H. SNELL.