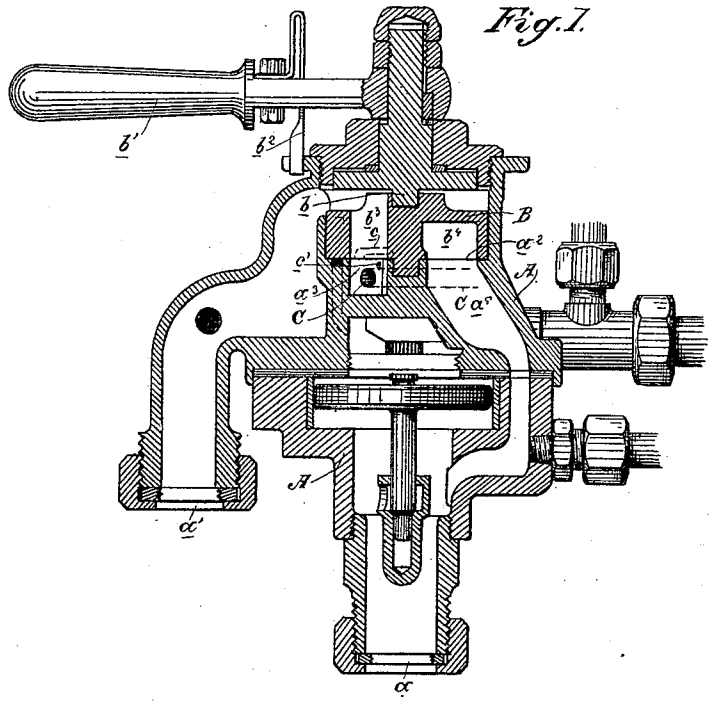
(No Model.) 2 Sheets—Sheet 1.

J. T. WILSON.

ENGINEER'S AIR BRAKE VALVE.

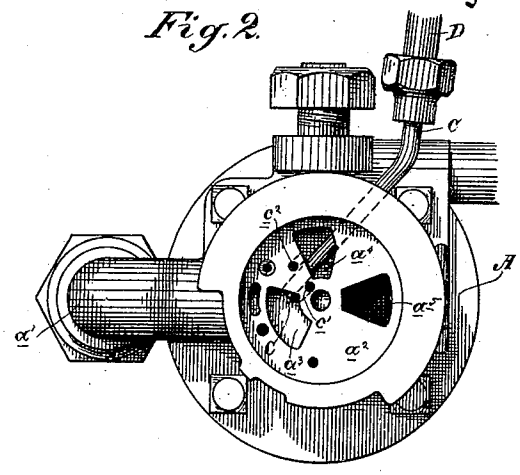
No. 461,725. Patented Oct. 20, 1891.

Fig. 1.



Driving Wheel Brake.

Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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No. 461,725. Patented Oct. 20, 1891.

Fig. 3.

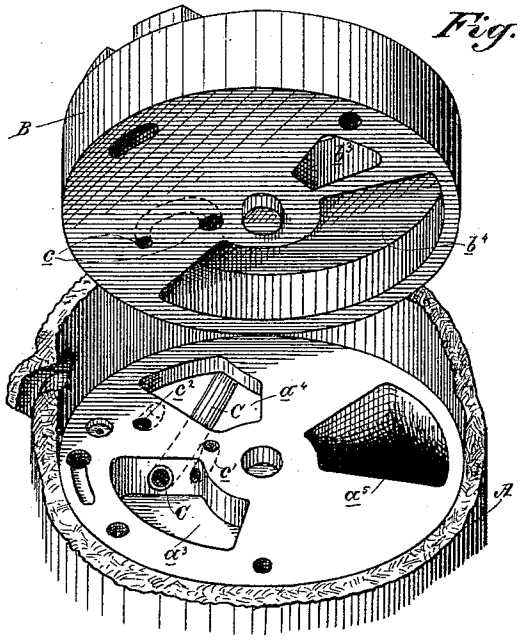
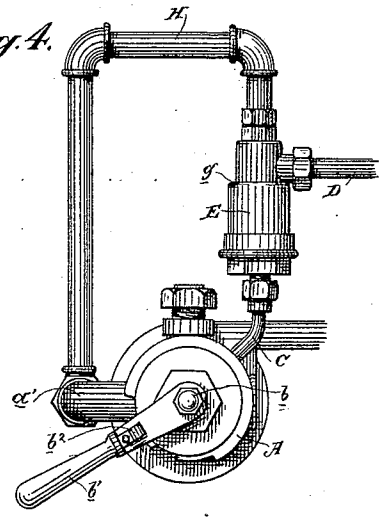
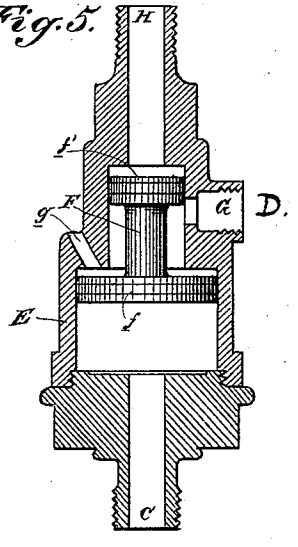


Fig. 4.



M.R

Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN TYLER WILSON, OF SAN FRANCISCO, CALIFORNIA.

ENGINEER'S AIR-BRAKE VALVE.

SPECIFICATION forming part of Letters Patent No. 461,725, dated October 20, 1891.

Application filed May 20, 1891. Serial No. 393,449. (No model.)

To all whom it may concern:

Be it known that I, JOHN TYLER WILSON, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Engineers' Air-Brake Valves; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the general class of air-brakes; and it consists of the construction and combination of devices which I shall hereinafter fully describe and claim.

A general and brief description of the usual construction and operation of the devices now in use will give a better understanding of my improvements, which will be hereinafter fully described, and specifically pointed out in the claims.

The engineer's brake and equalizing discharge-valve of the ordinary type consists of a valve shell or body connected with the brake-pipe and also with the main reservoir. It has within it a rotary valve provided with suitable ports, and said valve is operated by means of a handle. The valve body or shell contains other parts and devices, which are unnecessary herein to describe, as they are the usual ones in these appliances that my invention relates to and are well understood. There are several positions of the handle which have received distinctive names indicative of the operations to be performed. The first position is termed the "position for releasing the brake." The next is the position while running. The next is the position on lap. The next is the position for the application of the brake to the general train-service. The final position is known as the "emergency stop," and is only used, as the name implies, when it is desired to obtain the most forcible application of the brakes. These positions succeed one another, and are reached successively by the movement of the handle in the same direction.

Brakes are not only applied to the wheels of the cars and tender of the train, but are also applied to the driving-wheels of the locomotive. The former brakes are known as the "train-service," while the latter are known as the "drive-wheel," brakes. There are two ways in which they are arranged with relation to each other. One is to unite them, and in this form of connecting the brakes, whenever applied to the wheels of the train cars and tender, are also applied to the driving-wheels of the locomotive. This uniting of the brakes is found in practice to possess many disadvantages and is seldom used. One disadvantage is that the brakes must be very delicately handled to avoid a too forcible application of them to the driving-wheels, which would result in a sudden checking of the momentum, producing a shock. Another is the wear and tear on the tires of the driving-wheels, which is very great, especially on long grades, where the brakes have to be constantly applied for great distances. These disadvantages have resulted, therefore, in the adoption of another form of application—namely, the separate application of the train-service brakes and the driving-wheel brakes. This separate application requires a separate lever or handle for the operation of the driving-wheel brakes, and the disadvantage of this method is that the engineer is required to perform two distinct operations—namely, the operation of the handle of the train-service brakes and a separate operation of another handle to apply the brakes to the driving-wheels. This double operation is a severe strain upon the engineer's mind and is not likely to be performed under the very circumstances which are intended to call for its performance—namely, an emergency.

The object of my present improvement is to provide means by which the disadvantages of both the methods heretofore described are avoided, said means insuring the best results by the operation of a single handle having movements and stops precisely the same as are at present employed, applying the brakes for the train-service only at the ordinary brake-service stop and applying the brakes fully for the train-service, and also the brakes for the driving-wheels of the locomotive at the emergency stop. Therefore by my improvements the brakes do not have to be so carefully manipulated, nor is there any wear and tear upon the driving-wheels, as their brakes are only applied in cases of emergency, and, finally, there are no separate operations to be performed by the engineer; but, on the contrary, the present and usual operation of a single handle is all that is required.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a vertical section of my improved valve. Fig. 2 is a plan of the valve-seat. Fig. 3 is a perspective view of the rotary valve and its seat, the former being shown raised to exhibit its under side. Fig. 4 is a plan showing the arrangement for the direct application. Fig. 5 is a section of the valve-shell E and valve F.

A is the valve shell or body as now in use, having within it the usual and ordinary parts, of which the rotary valve B and its immediate connections only need description. This valve-body is connected, as usual, at a to the brake-pipe of the train-service and at a' to the main reservoir. The valve is operated by means of the key b and the handle b', which is provided with the usual spring b^2, controlling its movement, said handle playing about the flange of the top cap of the valve-body in the usual manner and having the usual stops. In the seat a^2 are made the usual ports—namely, the supply-port a^3, the exhaust-port a^4, and the direct-application port a^5. In the rotary valve are made the usual ports, consisting of the supply-port b^3 and the exhaust-cavity b^4. The operation of these ports is well known and needs no particular description. In those cases in which both the driving-wheel brakes and the train-service brakes are united the connection of both brake-pipes is formed with the end of the valve-body at a, and both brakes are always operated together.

My first improvement relates to that form of brake application known as "automatic." It consists in connecting by a pipe C the brake-pipe represented by D, which operates the driving-wheel brakes, with the supply-port of the engineer's valve and controlling this connection by a suitable port in the rotary valve. This pipe C extends into the supply-port a^3, as shown. In the valve is made a port c and in the valve-seat are made ports c' and c^2. The port c' connects with supply-port a^3 and the port c^2 connects with the exhaust-port a^4. One end of port c in the valve is adapted to connect with port c' in the seat and the other end with port c^2. Thus the pipe C is controlled by the rotary valve. The position of the ports c, c', and c^2 is such that when the handle is turned to the brake-service stop the pipe C of the driving-wheel-brake connection will be closed, thereby preventing the application of said brakes, while permitting the ordinary application of the train-service brakes; but when the handle is pushed around to the brake emergency stop the port c is brought into connection with ports c' and c^2, and through them with the supply-port a^3 and exhaust-port a^4 in the valve-seat and with the pipe C of the driving-wheel-brake connection, so as to open said connection and permit the application of the driving-wheel brakes simultaneously with the full application of the train-service brakes. It will be seen, therefore, that the movement of the handle is the same as usual, taking the same positions and involving no other operation than is customary in this class of devices. Therefore the train-service brakes may be applied, ordinarily, without applying the driving-wheel brakes, the latter being only applied in an emergency when the train-service brakes are fully applied. This connection, as heretofore stated, is to be used in connection with the automatic application of the brakes; but where it is desired to apply the air direct to the driving-wheel brakes I have, in connection with the parts heretofore described and operating as stated, the following construction to accomplish the object. (See Figs. 4 and 5.)

E is a valve-shell having within it a double-ended valve F, one end f of which is of greater area than the other end f'. In the shell between these two heads of the valve is let the connection G, with the driving-wheel-brake pipe D, and g is the exhaust-port from said shell, which is controlled by the larger end or head of the valve when seated. This shell is located at any suitable point intermediate of the main-reservoir connection and the pipe C, heretofore described. I have here shown it connected with the end of the pipe C, the larger end or head of the valve being exposed to this connection, and I have shown its other end connected by a suitable pipe H with the main-reservoir connection a' of the valve body or shell A. Now in ordinary operation when the handle is over at all the points except the emergency stop the pressure upon the greater end or head of the valve F will be sufficient to keep said valve to its seat against the pressure upon its smaller end, and thus the driving-wheel-brake pipe will be closed; but when the handle is moved over to the emergency stop, and the pipe C and port c being thereby opened, as heretofore described, and the pressure on the larger end of the valve being thereby relieved, the pressure on its small end will cause the valve F to move, whereby direct communication is established between the main reservoir and the driving-wheel-brake supply-pipe, and the air passes directly through the end of the shell E and through the connection G into said pipe. The interposition of this valve F dispenses entirely with the complicated triple valve to driving-wheel brakes which is now in use.

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

1. In air-brakes, the improved engineer's brake-valve consisting of the body or shell connected with the main reservoir and with the brake-pipe of the train service and having the supply, exhaust, and direct-application ports, the rotary valve having the supply-port and exhaust-cavity for controlling the train-service-pipe connection, the separate port c in the valve and the ports c' and

c^2 in the valve-seat connecting with the supply and exhaust ports, and the pipe connecting the drive-wheel-brake pipe with the supply-port of the shell or body, substantially as herein described.

2. In air-brakes, the engineer's brake-valve having the rotary valve with ports controlling the connection with the train-service-brake pipe and a separate port controlling the connection with the drive-wheel-brake pipe, in combination with the valve-shell E, let into the drive-wheel-brake connection and connected with the main reservoir, and the valve in said shell or body having ends of different areas for passing the air direct to the drive-wheel-brake pipe, substantially as herein described.

In witness whereof I have hereunto set my hand.

JOHN TYLER WILSON.

Witnesses:
S. H. NOURSE,
J. A. BAYLESS.