No. 788,985. PATENTED MAY 2, 1905.

D. K. YOUTZ.

AIR BRAKE SYSTEM.

APPLICATION FILED OCT. 6, 1904.

Fig: 1.

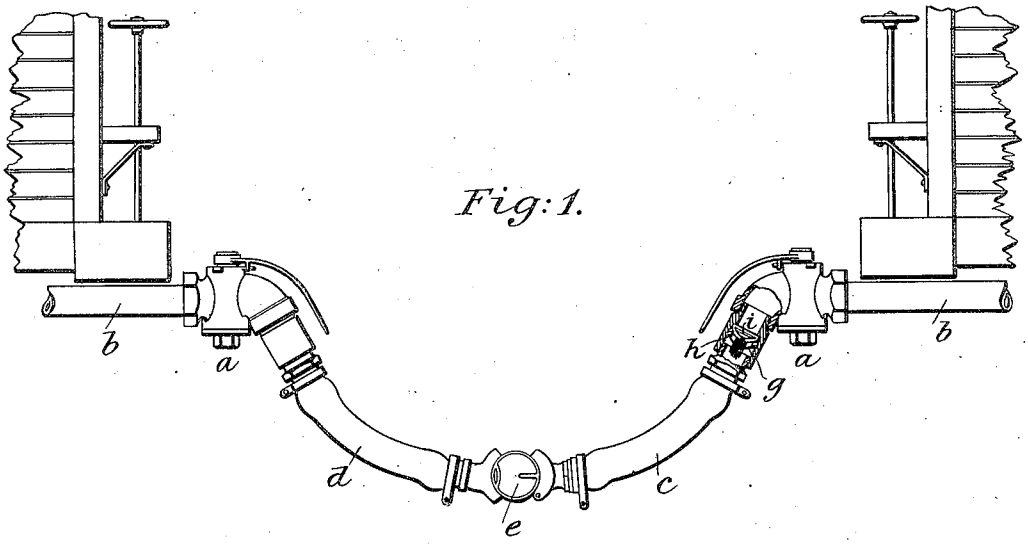


Fig: 2.

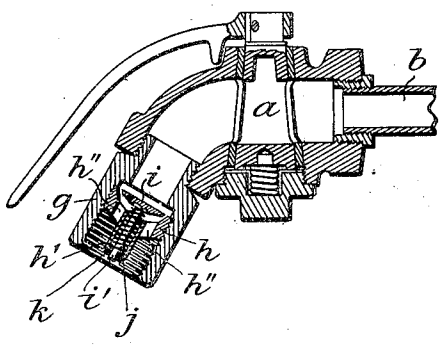


Fig: 3.

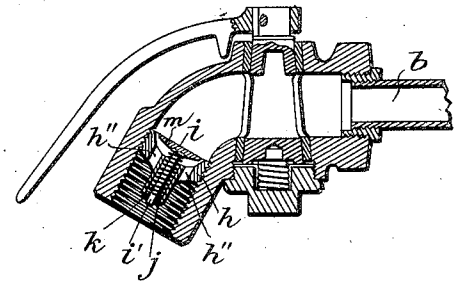
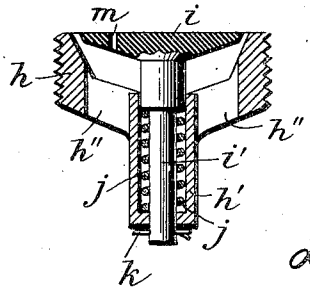


Fig: 4.



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UNITED STATES PATENT OFFICE.

DAVID K. YOUTZ, OF McKEES ROCKS, PENNSYLVANIA.

AIR-BRAKE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 788,985, dated May 2, 1905.

Application filed October 5, 1904. Serial No. 227,230.

To all whom it may concern:

Be it known that I, DAVID K. YOUTZ, a citizen of the United States, and a resident of McKees Rocks, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Air-Brake Systems; and I do hereby declare the following to be a description thereof sufficient to enable others skilled in the art to which my invention appertains to make and use the same.

My invention relates to air-brake systems for railroad-trains, and has more special reference to a novel construction of valve adapted for service in connection with the air-brake systems at present in use, the object being to produce a valve which may be conveniently applied at appropriate places along the brake-pipe or main line, which will in no way interfere with the proper action of the air in applying the brakes either under emergency conditions or in the ordinary service application thereof, and which will automatically adjust itself when a train-line may have become broken or a leakage occurs in the hose-coupling or main line, regulating the exhaust of the air so that the brakes on that portion of the train-line to the rear of where such break or leakage occurs (and which has been charged with air in the usual manner) will act only in the service application, causing the rear of train to be stopped in a similar manner and as effectively as if the engineer had manipulated the valve to give the usual service application. Therefore the crashing into the head portion of the train by the rear portion thereof would be effectively prevented and much danger to passengers and wreckage of cars successfully averted, as by the use of my invention it will be obvious that under the conditions above cited the emergency feature in the brake systems would practically be eliminated and be changed into the service application.

With the above and other objects in view my invention may be said to comprise a valve, a seat for said valve secured within and interposed at appropriate intervals between the primary source of pressure and the brake-cylinders, preferably within the angle-cocks, and means for keeping said valves normally away from their seats.

My invention further comprises a valve, a seat for said valve secured within and interposed at appropriate intervals between the primary source of pressure and the brake-cylinders, preferably within the angle-cocks, means for keeping said valves normally unseated, and means whereby when said valves are seated under pressure the air is permitted to gradually exhaust, so as to maintain an equivalent service application.

My invention further comprises certain novel features of construction and arrangement of parts, all of which will be hereinafter fully described, and particularly pointed out in the claims.

To more fully comprehend the nature of my invention, however, and the manner in which the same is or may be carried into effect, reference must be had to the accompanying drawings, forming part of this specification, whereon similar reference-letters indicate corresponding parts in all the figures, and wherein—

Figure 1 represents the lower portion of two adjacent cars in side elevation, showing my invention applied to the ordinary angle-cock, which I have shown partly in section. Fig. 2 represents a central section of the ordinary angle-cock removed and on an enlarged scale, showing my invention applied thereto. Fig. 3 represents a similar view of the preferred form of angle-cock constructed according to my invention. Fig. 4 represents an enlarged central section of the valve and seat.

I will now proceed to describe my invention in connection with said drawings, premising that practical means are there shown for carrying the same into successful operation, and will then point out the novel features in the claims, it being understood, however, that I do not limit myself to the precise details of construction and arrangement of parts, as they may be amplified, changed, or modified without departing from the principle or sacrificing any of the essentialities of my invention.

Referring now to Figs. 1 and 2 of the drawings, *a* designates the ordinary angle-cock,

which is connected up at one end to the brake-pipe or main line *b* and at its other end to the usual flexible hose-section *c*, the latter being secured to the opposing hose-section *d* by means of the coupling *e*, thereby forming the connections between each car and so completing the main line or brake-pipe throughout the entire train. As all this is of the usual construction and common to the brake systems now in use, no further description thereof is needed. The downwardly-turned end of the angle-cock is internally threaded to receive the end of the hose-section in the usual manner, and when my invention is to be used at the angle-cock I screw into such threaded end a suitable bushing *g*, and the outer end of this bushing is internally threaded to receive not only the hose-section, but also a valve and valve-seat, which form the subject-matter of my present invention. The valve-seat is here shown as comprising a head *h*, externally threaded to engage the threaded interior of the bushing *g*, as shown, and having its upper face recessed or hollowed out to form an appropriate seat for the valve *i*, whose stem *i'* moves in and passes through an opening at the lower end of a socket *h'*, depending from and integral with the head *h*. A plurality of openings *h''* are provided in the head *h* to permit of the free passage of air therethrough in either direction, so that when service or emergency application is given to the brakes it will be apparent that no interference or obstruction is offered to such service. The valve is normally kept unseated through the medium of a spring *j*, which surrounds the valve-stem *i'*, one end of which rests against the under side of the valve and the other end is housed within and rests upon the lower end of the socket *h'*. The lower end of the valve-stem *i'*, which projects through the socket, is perforated to receive a cotter *k*, by which means the valve is limited in its movement away from its seat, as will be understood. I may dispense with the cotter mentioned and thread the protruding end of the stem to receive suitable nuts (not shown) in the well-known way. The valve is provided with a small perforation or vent *m*, which when it has been seated under the influence of air-pressure thereon will allow the air to slowly exhaust from the main line or brake-pipe.

Referring to Fig. 3, it will be seen that the bushing *g* is dispensed with; but in other respects the other and essential parts of my invention are similar in every respect to those described in connection with Figs. 1 and 2. The downwardly-turned end of the angle-cock, however, is lengthened somewhat to receive the valve and its seat, as shown, and this construction I prefer when old angle-cocks are to be replaced with new ones or where an entirely new service is being installed.

My invention may, if desired, be connected up to the branch pipe, which leads to the triple valve and brake-cylinder, and in this connection it will only be necessary to state that the externally-threaded end of the bushing *g* will be screwed into the cut-out cock, and the internally-threaded portion thereof will receive the nipple which leads from the main line or brake-pipe.

Obviously my invention may be positioned in any appropriate place or places throughout the ordinary air-brake systems and where the most effective results may be obtained; but I prefer to have it placed within or form part of the angle-cocks, as shown clearly in Figs. 1, 2, and 3 of the drawings.

The operation of my invention is as follows: The air-pump in the engine having been put in operation, the air is forced through the main line or brake-pipe into the auxiliary reservoirs in the usual manner and under any predetermined pressure, during which operation such air will pass through the openings *h''* in the valve-seat and around the periphery or outer edge of the valve *i*, which latter offers no obstruction whatever to its free passage. The air having filled the auxiliary reservoirs, it will be apparent that an equal pressure will be exerted upon both sides of the valve, thus keeping them unseated, and during the passage of the air into said reservoirs the springs *j* will maintain such valves in an unseated position; but should a leak occur in the main line or hose-coupling or the train accidentally become uncoupled the air-pressure will be increased to the maximum or approximately maximum degree, forcing the valves located on the rear portion of the train beyond where the leakage or break occurs to their seats, thereby causing the brakes to be applied in a similar manner and as effectively as if the engineer had given service application. The rear portion of the train would thus be brought to a standstill, while the forward part thereof would still remain under the control of the engineer, and he could either allow such forward part to continue its speed in the case of uncoupling or stop it in the usual manner in case of leakage, and thereby prevent those accidents where under existing conditions the rear end would crash into the forward portion of the train. The opening or air-vent *m* in the valves *i* in such emergencies permit the air to exhaust slowly, so that the brakes will act as if service application had been given.

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

1. The combination in an air-brake system, of an angle-cock secured to the main line or brake-pipe, a body or casing contiguous to the angle-cock and having an internally-threaded channel, a head externally threaded secured within the casing adjacent to the angle-cock, said head having its surface adjacent to the angle-cock hollowed out to form a valve-seat

and provided with a plurality of openings causing communication between the angle-cock and casing, a socket *h'* carried by the head centrally thereof, a stem slidably mounted in said socket, a spring surrounding the stem within the socket to exert an outward tension, a valve carried by the stem adapted to fit upon said seat of the head and provided with a vent *m* therethrough, and means for limiting the movement of the valve away from its seat.

2. The combination in an air-brake system, of an angle-cock secured to the main line or brake-pipe, a body or casing contiguous to the angle-cock and having an internally-threaded channel, a head externally threaded secured within the casing adjacent to the angle-cock, said head having its surface adjacent to the angle-cock hollowed out to form a valve-seat and provided with a plurality of openings causing communication between the angle-cock and casing, a socket *h'* carried by the head centrally thereof, a stem slidably mounted in said socket, a spring surrounding the stem within the socket to exert an outward tension, a valve carried by the stem adapted to fit upon said seat of the head and provided with a vent *m* therethrough, and a pin passing through the stem to limit the movement of the valve from its seat.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DAVID K. YOUTZ.

Witnesses:
W. J. TINDALL,
J. A. MATTHEWS.