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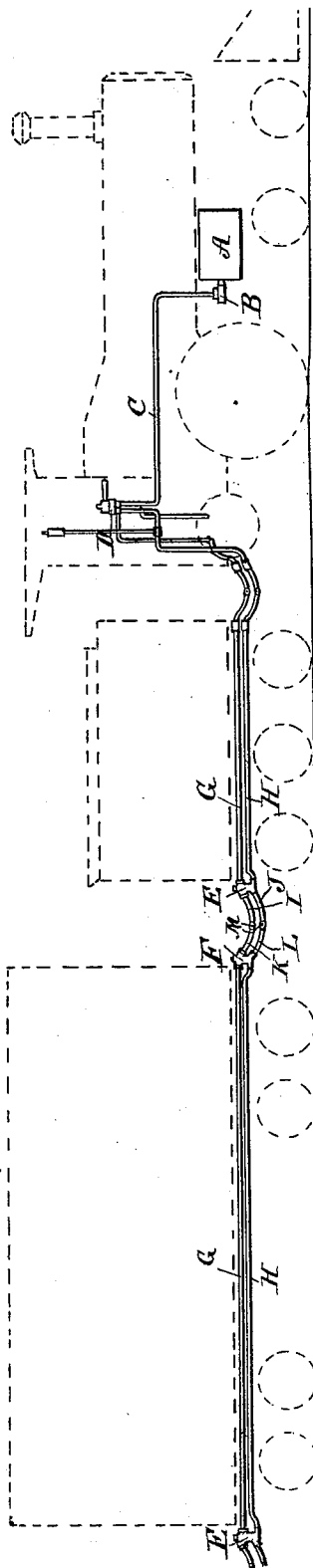
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J. P. BROWN.
AUTOMATIC AIR BRAKE.

No. 520,391.

Patented May 22, 1894.

Fig. 1.



WITNESSES

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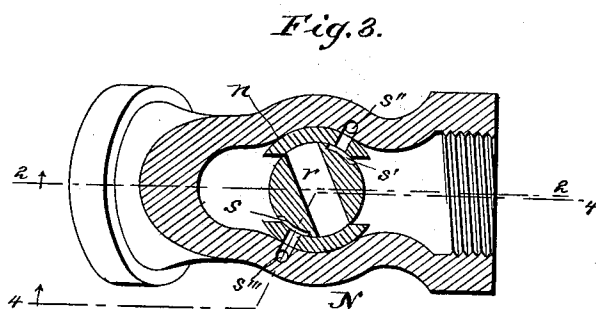
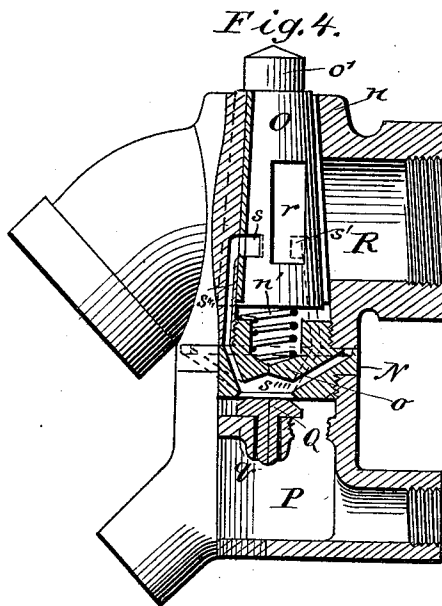
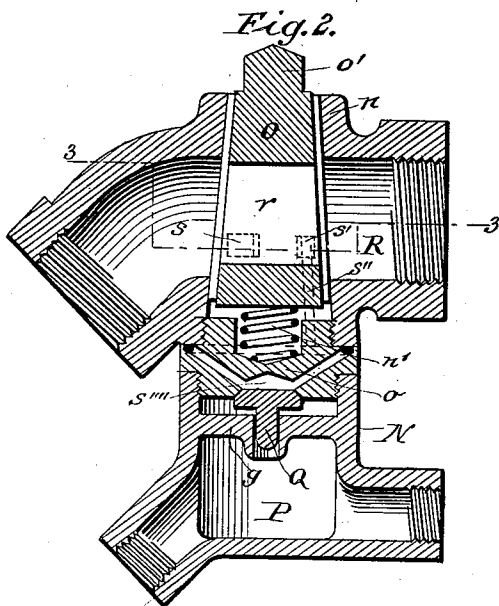
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AUTOMATIC AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 520,391, dated May 22, 1894.

Application filed January 22, 1894. Serial No. 497,659. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH P. BROWN, a citizen of the United States, residing at Somerset, in the county of Pulaski and State of Kentucky, have invented certain new and useful Improvements in Automatic Air-Brakes for Railroad-Cars; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in automatic air brakes for railway cars, and the object in view is to provide a system by which the engineer in the cab of the locomotive will be automatically signaled when any one or more of the car-brakes are cut out of his control by accidental movement of one of the angle-cocks on the brake-hose between the cars, and to enable the engineer to apply the brakes on the remaining cars in order to bring them to a standstill at a point of safety.

In this invention I contemplate the use of a second or additional pipe independent of the primary pressure pipe for operating the brakes on the cars, and this second or additional pipe, which I shall hereinafter term a "safety" pipe, is connected with an automatic, pneumatic-whistle or other suitable signal in the cab of the locomotive, and the safety-pipe is furthermore connected with an engineer's three-way valve and with an air-reservoir in which a pressure is maintained greater than the pressure in the primary-brake-pipe. On each car is provided an angle cock to which is connected the hose provided with the coupling-members by which the adjacent cars can be coupled in series; and each angle cock is constructed with a plug having a passage which normally is in line with the chamber of the shell of the cock so that the air pressure required for the manipulation of the brake is free to pass through the angle-cock. The plug of this cock is further provided with longitudinal passages which, when the plug is accidentally turned to bring the passage out of line with the air-passage in the valve-shell, are brought to align with vertical passages in the cock-shell

so as to permit a small volume of compressed air to pass in the chamber of the angle cock to which is connected the safety-pipe, whereby the escaping compressed air is caused to pass through the safety-pipe and operate the signal in the cab to notify the engineer that one of the angle-cocks is out of position and hence one of the brakes on a car is beyond his control. In the angle-cock is further provided a valve which is adapted to close these by-pass passages or ports which lead from the brake-pipe passages to the safety-pipe chamber, so that when the engineer turns the three-way valve to admit an air-pressure from the high-pressure reservoir into the safety-pipe, the supplemental valve in the angle-cock will be moved to close the by-pass passages and cause the air from the brake-pipe to pass through the angle-cock and on into the brake-pipe of the adjoining car, whereby the brakes can be applied and the cars brought to a standstill.

The invention further consists in the peculiar construction and combination of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a diagrammatic view illustrating my improvement in connection with a locomotive and an ordinary railway car. Fig. 2 is an enlarged vertical sectional view through one of the angle-cocks. Fig. 3 is a sectional view, on the same scale as Fig. 2, the plane of the section being taken horizontally through the air passage for the brake-pressure in the upper part of the angle-cock, and showing the plug turned out of position so that the air will escape into the safety pipe. Fig. 4 is a sectional view similar to Fig. 2 but showing the supplemental valve in the angle cock in its normal position to permit the air to pass, from the brake-pressure pipe, into the safety-pipe, the plug of the angle-cock being in the position shown by Fig. 3.

Like letters of reference denote corresponding parts in all the figures of the drawings, referring to which—

A designates the high-pressure air-reservoir on the locomotive and in which the air under pressure, say of one hundred pounds, is supplied by any suitable means. To this high-pressure reservoir is connected a reducing

valve, B, so constructed with a tension spring or other device that the air in passing from the reservoir through the valve will be reduced in pressure from one hundred pounds to about eighty pounds, or to any pressure at a suitable point above the pressure under which the air is supplied through the primary brake-pipe to operate the brakes, it being essential in my invention that the air pressure in the safety-pipe shall be in excess of the air pressure in the brake-pipe. From this reducing valve leads a pipe, C, which is connected to a three-way valve, D, in the cab of the locomotive, which valve is within convenient reach of the locomotive engineer and under his immediate control.

E is an angle cock on the tender or one of the cars of the train, and F is another angle-cock on the adjacent end of the next car. To the cock, E, is connected the primary-brake-pipe, G which leads to the cab and to which the air under the pressure necessary to apply the brakes is supplied in the usual or any preferred way. To a separate chamber of this angle-cock, E, is connected the safety-pipe H which leads to and is connected with the three-way valve D in the cab, and in this pipe, H, is provided a pneumatic whistle, or other suitable signaling device, which will be operated by the force of the compressed air that may escape under the conditions presently described from the primary brake pipe into the safety pipe and by the latter conducted to the signal. To this cock, E, are connected the brake-hose, I, and the safety-hose, J; and to the angle-cock, F, are connected a similar brake-hose, K, and safety-hose, L. These brake hose I, K, and safety-hose, J, L, may be detachably connected together by the separable couplings, M, of the usual or any preferred pattern.

Having now described the general organization of my automatic brake, I will now proceed to a detailed description of the angle cock shown by Figs. 2, 3, and 4 of the drawings; and as each angle-cock is the same in construction and mode of operation, a description of one cock will answer for the others. The shell N of the cock is provided with a vertical tapered seat, *n*, within the same for the tapered plug, O, which is fitted snugly within said seat, *n*, and normally pressed against the same by means of a coiled spring, *n'*, one end of which bears against the plug and the other end of said spring bears against the bridge, *o*, which is fixed in the shell, N, beyond the seat of the plug, said bridge having a socket in which is fitted the spring so that the latter is not liable to become displaced. Below this bridge, the shell, N, of the cock is provided with a chamber, P, with which connects the safety-pipe, and between this chamber, P, and the plug is arranged a valve-seat, *q*, on which is seated a supplemental valve, Q, which plays toward and from the bridge, *o*, said supplemental valve having a pendent stem by which

it is guided in its seat. The plug, O, is adapted to be turned axially within the shell N of the angle cock, for which purpose it is furnished with an external handle, *o'*, connected to one end thereof so that the train-man can turn the plug to cut off the flow of air through the brake-pipe. In this plug is provided the passage, *r*, which is cut at right angles to the longitudinal axis of the plug, and when the brake mechanism is in operative condition, the plug is turned so that this passage, *r*, is in line with the passage, R, through the shell, N, to which passage is connected the primary brake-pipe. This plug, O, of the angle-cock is further provided with vertical by-pass ducts or passages, *s s'*, which are formed therein on diametrically opposite sides and in the walls of the shell, N, are provided vertical passages, *s''* and *s'''*, which passages extend downward through and across the lower part of the bridge, so that said passages, *s''* and *s'''* meet at a common point, *s''''*, over the supplemental valve, as shown by Figs. 2 and 4 of the drawings.

This being the construction of my brake mechanism, the operation may be described as follows: The primary brake-pipes are to be charged with air, say to a pressure of seventy pounds, all the angle-cocks are opened, and the hose on the rear car of the train are connected to a dummy hose coupling. While the train is in motion, the angle-cocks are liable to be turned accidentally by a chain striking against the same, and through the ignorance or carelessness of a person on the car, in which event the air in the primary brake pipe G cannot pass through the passages, R, *r*, in the angle cock, so that the brakes beyond that particular car are cut out of service. In the event of the plug being turned to cut off the brake mechanism, the passages, *s, s'* in the plug will be brought into alignment with the passages, *s''* and *s'''*, so that the air will pass down the passages, past the valve O, and into the chamber P, from whence the air passes through the safety pipe to the cab of the locomotive and there operates the signal to warn the engineer that the brake mechanism is out of order. The engineer now operates his three-way valve, D, to permit air under a higher pressure than the train-brake pressure to pass from the reservoir A through the pipe C and the safety pipe H so that this high pressure air will force or lift the supplemental valve Q against the bridge, *o*, to close the common point, *s''''* of the passages, *s''* and *s'''*, whereby the air in the train pipe is caused to pass down the passages *s, s''* on one side of the plug, then across from the passages *s, s''* up to and through the passages, *s', s'''*, and thence to the opposite side of the plug and through the primary brake-pipe, the valve, Q, being held against the bridge by the greater pressure of air in the safety-pipe. The train can thus be brought to a standstill with safety, and the engineer should examine all the stop cocks to

see that they are in proper position, then restore the three way valve to its first position to release the air from the safety pipe, and the train is then ready to proceed on its way.

5 It is evident that slight changes in the form and proportion of parts and details of construction of the mechanism can be made without departing from the spirit or sacrificing the advantages of my invention.

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

1. The combination with a primary brake pipe, of a safety-pipe connected with a signal mechanism, an angle-cock to which both the 15 brake and safety pipes are connected, and a plug in said angle cock having means for admitting the air from the brake pipe to pass into the safety pipe should said plug be 20 turned to shut off the passage of air through said primary-brake pipe, substantially as and for the purposes described.

2. The combination with a primary brake-pipe, a high-pressure air reservoir, and a 25 safety-pipe connected with said reservoir, of an angle cock to which said brake pipe and said safety pipe are connected and provided with a plug constructed to permit air to pass from the brake pipe into the safety pipe, and 30 mechanism operated by pressure from the high-pressure reservoir to cut off the passage of air from the brake pipe to the safety pipe and cause said air to continue around the plug, through by-pass ducts, into and through 35 the primary brake pipe, for the purposes described, substantially as set forth.

3. The combination with a primary-brake-pipe, a safety-pipe, a high-pressure reservoir having a valved connection with said safety- 40 pipe, an angle cock to which the brake and safety-pipes are connected, a plug within said angle cock having by-pass passages through which the air from the brake pipe can pass into the safety pipe when said plug is turned

to shut off the passage of air through the 45 brake pipe, and valve mechanism within said angle cock arranged to be operated by high pressure current from the reservoir to close the passage of air from the brake-pipe into the safety pipe and cause the air in the brake 50 pipe to pass around the plug and continue through said brake-pipe, for the purposes described, substantially as set forth.

4. The combination with a brake-pipe, a safety-pipe, a reservoir connected with said 55 safety-pipe, an angle cock connected with said brake and safety-pipes and having the by-pass ducts around the plug-seat therein, a plug within said angle-cock and provided with the transverse port and with the ducts 60 arranged to align with the by-pass ducts, and a supplemental valve operating against the by-pass ducts to prevent the same from discharging into the safety-pipe, for the purposes described, substantially as set forth. 65

5. The combination with a brake pipe, of a safety pipe connected with a signaling mechanism, a high-pressure reservoir, a three way valve between said reservoir and the safety-pipe, an angle cock connected with the 70 brake and safety pipes and provided with the by-pass ducts around its plug-seat and with the valve seat, a plug having the transverse port and the ducts arranged to coincide with the by-pass ducts, and the valve normally 75 resting on said valve seat and exposed to action of the high-pressure current from the reservoir to cut off the passage of air from the brake-pipe into the safety pipe and cause the air to continue around the plug and through 80 the brake-pipe, for the purposes described, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH P. BROWN.

Witnesses:

C. S. BICKERS,

THOS. J. LENEHAN.