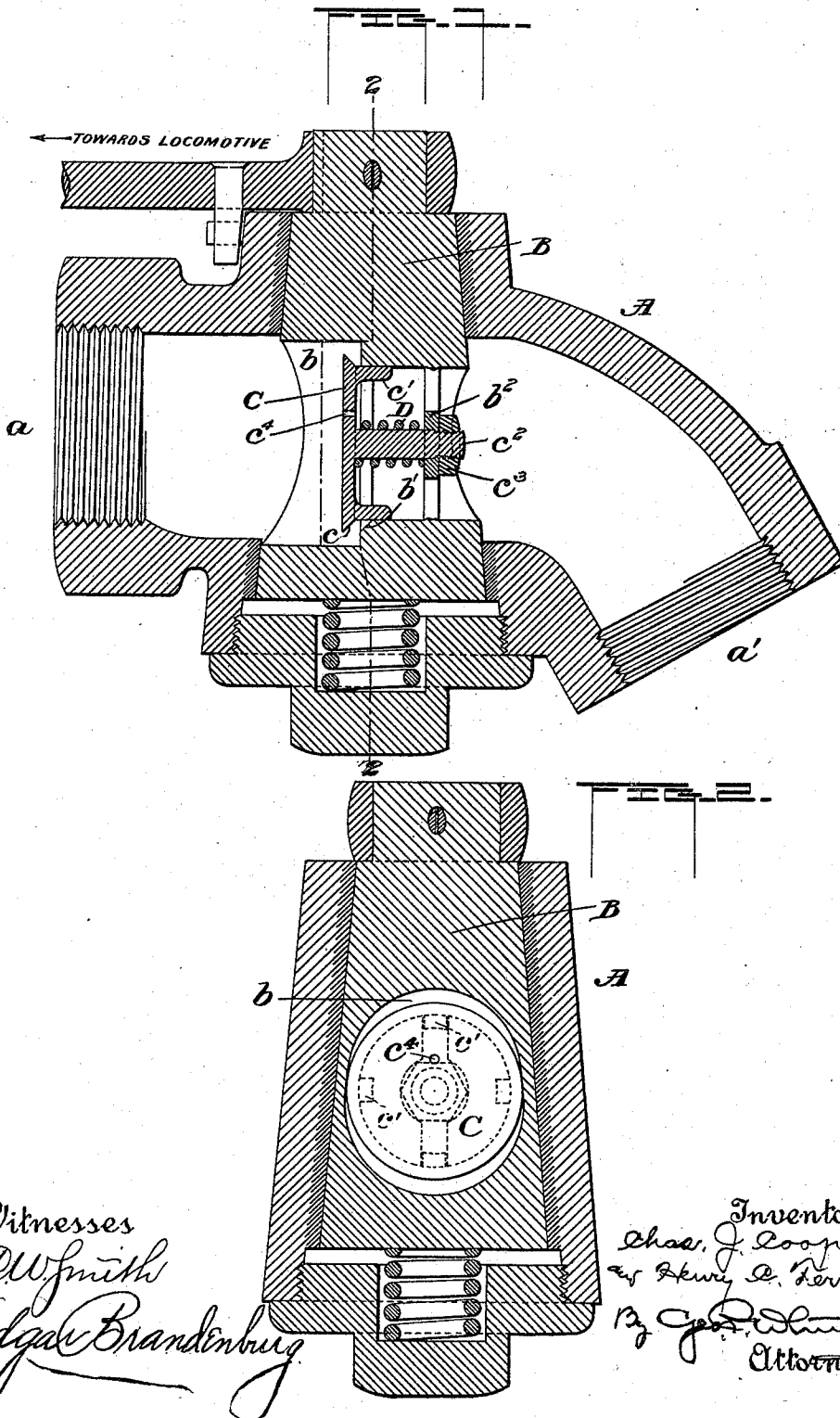


C. J. COOPER & H. C. FERRIS.
ANGLE COCK.

No. 535,813.

Patented Mar. 19, 1895.



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UNITED STATES PATENT OFFICE.

CHARLES JOSEPH COOPER, OF KENTON, AND HENRY CARR FERRIS, OF
COLUMBUS, OHIO.

ANGLE-COCK.

SPECIFICATION forming part of Letters Patent No. 535,813, dated March 19, 1895.

Application filed November 8, 1894. Serial No. 528,032. (No model.)

To all whom it may concern:

Be it known that we, CHARLES JOSEPH COOPER, residing at Kenton, in the county of Hardin, and HENRY CARR FERRIS, residing at Columbus, in the county of Franklin, State of Ohio, citizens of the United States, have invented certain new and useful Improvements in Angle-Cocks; and we 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.

Our invention relates to automatic air-brake systems, and its object is to give the engineer full control of that part of a train remaining attached to the locomotive when the train accidentally breaks in two.

In the operation of the automatic air-brake, as generally applied to railway trains, whenever one or more cars become detached from the rest of the train, the uncoupling of the air brake hose pipes between the two portions of the train automatically sets the brakes on both of said portions. It is desirable, however, to prevent this action upon the front portion, so as to leave the engineer in as full control as usual of so much of the train as remains attached to the locomotive. Under ordinary circumstances this control can only be regained by closing the angle cock in the air brake train pipe at the rear of the last car on said front portion of the train. This enables the normal train pipe pressure to be restored, thereby releasing the brakes. The closing of this angle cock must be done by a trainman, since all the cocks except the last on the train stand open.

Our invention consists in an angle cock which, when the train pulls in two, automatically closes at the rear of the front portion, but remains open at the front of the rear portion of the train. It thus prevents the automatic setting of the brakes on the front portion, but does not prevent their so setting on the rear portion.

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

Figure 1 is a vertical longitudinal section of our improved angle cock, and Fig. 2 is a cross section on lines 2—2 Fig. 1.

The valve casing A is the same as that of the ordinary angle cock. It connects at *a* with the train pipe which runs under the car, and at *a'* with the coupling hose. The plug valve B is arranged as usual, to shut off the flow of air when turned at right angles to the train pipe. In the drawings the valve is shown open, with its port *b* in line with the train pipe. In the port *b* we interpose a check valve C, preferably with a conical face *c* to close against a conical seat *b'*, and provided with wings *c'* to guide it. The check valve has a stem *c²* which passes through a hole in the bridge *b²* and has a nut *c³* to limit the outward movement. A helical spring D surrounds the stem, abutting at one end against the bridge, and at the other against the valve, and tending to hold the valve normally away from its seat, so as to leave a practically unobstructed passage way through the plug valve B. The spring D is of sufficient tension to resist the ordinary variations of air pressure during the application and releasing of the brakes; one of these angle cocks being attached to the train line at each end of every car. If the handles upon the plug valves are all turned toward the engine the check valves will all face the same way. All the valves having been faced toward the engine, when the air is applied to set the brakes the reduction in the train line pressure is toward the engine and these check valves do not affect the working of the brakes in any way; but if one or more cars break off or become separated from the train, the pressure back of the valve C at the rear end of the last car remaining attached to the engine is reduced to atmospheric pressure, while the pressure in the train line being about seventy pounds, the amount usually carried, will overcome the spring D and close the valve C thus automatically closing the train line at the rear of the last car remaining attached to the engine and permitting the engine driver the same freedom in operating the brakes upon this part of the train that he had before the cars became separated. The reduction in pressure

in the train line of the cars that were detached will be toward the break in the train line and therefore in the same direction as when attached to the train and applying the
5 brakes in the regular way. Under these circumstances the valve C will remain open and the brakes will apply themselves automatically and stop the rear portion of the train. A leakage port is introduced at c^4 , a small
10 hole one-sixteenth of an inch in diameter, so that when taking on air-brake cars the sudden admission of the train line pressure may close the valve C but the pressure will soon adjust or equalize itself through this port;
15 also when recoupling to the detached portion of the train all that is necessary is to couple the hose and the leakage port c^4 will allow the air pressure to fill the train line and the brakes will release themselves in a very short
20 time. This port c^4 is not sufficiently large to prevent the train line pressure holding the valve C closed when the train separates and there is no pressure further than atmospheric on the side of the valve toward the rear of
25 the train.

While we have shown a check valve moving horizontally and held open by a spring, yet we do not limit ourselves to this specific construction, since the port b and the check
30 valve might be arranged in other positions, and other means than the spring D might be

used to hold the valve open, yet without departing from the spirit of our invention.

Having thus described our invention, what we claim is—

1. In an air brake system, the combination 35 with the train pipe, of a turning-plug angle-cock, a check valve controlling the port through the plug of said cock, and means for holding said check valve open toward the
40 source of pressure supply under the normal variations in said pressure, substantially as described.

2. In an air brake system an angle cock having its plug valve provided with a check 45 valve controlling the port through said plug valve, and a spring holding said check valve open toward the locomotive, under the normal train pipe pressure substantially as described. 50

3. An angle cock for air brake systems having the port in its plug valve controlled by a check valve containing a constantly open leakage port, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses. 55

CHARLES JOSEPH COOPER.
HENRY CARR FERRIS.

Witnesses:

MYRON D. JONES,
J. W. MARTIN.