

UNITED STATES PATENT OFFICE.

WINFIELD O. GUNCKEL, OF TERRE HAUTE, INDIANA, ASSIGNOR OF ONE-HALF TO PETER N. STAFF, OF TERRE HAUTE, INDIANA.

AIR-BRAKE VALVE.

No. 815,816.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed July 12, 1905. Serial No. 269,414.

To all whom it may concern:

Be it known that I, WINFIELD O. GUNCKEL, a citizen of the United States, residing at Terre Haute, in the county of Vigo and State of Indiana, have invented certain new and useful Improvements in Air-Brake Valves; and I do hereby 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.

This invention relates to the triple valves used in connection with air-brakes on railroad-cars; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a longitudinal section through the valve. Fig. 2 is an end view of the valve. Fig. 3 is a diagram of the slide-valves, showing a sectional plan view of same.

A is the casing of the valve, provided at one end with a cylinder B, in which a piston *b* is slidable.

C is a chamber for the slide-valves and their seat at the other end of the casing, and *c* is the opening at the last said end of the casing, which is connected to the auxiliary reservoir for compressed air in the usual manner.

D is a cover which closes the cylinder B, and *d* is a spring-buffer of any approved construction carried by the said cover and provided with a screw *d'* for adjusting it. This buffer preferably consists of a spiral spring 2, arranged between two caps or plates 3 and 4. A plate 5 is secured in a recess in the cover and bears against the cap 4, so that the caps and spring are retained in the spring-chamber 6 of the cover. The plate 5 has a central hole 7 for the end of the piston-rod, and the adjusting-screw *d'* bears against the cap 3.

In the side of the casing A there are two air-chambers E and F, which are closed by a plate G, which is secured to the casing.

The chamber E has an opening *e*, which communicates constantly with the brake-cylinder, and the chamber F has an opening *f*, which communicates constantly with the train-pipe. The chamber F has also a passage *f'*, which connects it constantly with the cover end of the cylinder B.

H is a removable seat for the slide-valves which is secured in the chamber C and pro-

vided with a V-shaped channel for the valves to slide in. This seat H is provided with passages *i*, *j*, and *k*, each said passage being in duplicate. The bottom end portions of the passages *i* and *j* extend vertically into the chamber E, and the bottom end portion of the passage *k* extends vertically into the chamber F.

L is the exhaust-passage which extends laterally through one side portion of the seat H and the side wall of the chamber C and which communicates with the atmosphere.

N is the auxiliary slide-valve, which is V-shaped in cross-section and which is slidable longitudinally in the channel of the seat H. This valve N has exhaust-cavities *n* in the middle parts of its outer sides and exhaust-holes *n'* extending from the said cavities through the sides. The auxiliary valve has also ports *o*, extending through the end portions on one side of the exhaust-holes, and an inlet-port *p* of very small area in its opposite end portion next to the cylinder B. The lower end of the port *p* is normally in communication with one of the passages *k*, and the exhaust-cavities are normally in communication with the passages *j*.

R is the main slide-valve, which is slidable in the V-shaped channel of the auxiliary valve N and which has an exhaust-port *r* extending crosswise through it and normally connecting the two exhaust-holes *n'*.

A piston-rod *b'* is secured to the piston *b* and to the main slide-valve R. A spring *s* is arranged above the main valve and operates to hold the slide-valves in working contact with their seats when not held thereto by air-pressure. The bottom edge of the main valve R is provided with a channel *t*, and the bottom edge of the auxiliary valve N is provided with a channel *t'*. These channels allow sand to blow through and prevent the faces of the valves from being abraded.

The main valve R is shorter than the auxiliary valve N, and the auxiliary valve N has bars or projections *m* at its end portions, so that it may be slid back and forth by the main valve R.

When the parts are in the positions shown in the drawings, the brake-cylinder is in communication with the atmosphere by means of the exhaust cavities and passages. The auxiliary reservoir is connected with the train-pipe by means of the chamber F and the pas-

sage or port *p* of very small area, which is uncovered by the main valve R.

When the brakes are to be applied lightly for an ordinary train stop, the pressure is reduced to a limited extent in the train-pipe, and the excess of pressure in the right-hand end of the cylinder moves the piston to the left, and with it the main valve R. The main valve closes the port *p* and the exhaust-port and uncovers the ports *o*, so that a direct passage for air from the auxiliary reservoir to the brake-cylinder is provided, and the brakes are thereby operated and applied.

When the brakes are to be applied for an emergency stop, the pressure in the train-pipe is reduced considerably and suddenly and the piston is moved to the left until arrested by the buffer. The main valve now moves the auxiliary valve to the left and places the two passages *j* and *k* in communication by means of the cavities *n*, so that the full pressure of air remaining in the train-pipe is applied direct to the brake-cylinder and the brakes are applied suddenly and forcibly.

What I claim is—

1. In an air-brake valve, the combination, with a casing provided with a cylinder and a valve-chamber, one end of the said cylinder having a train-pipe connection and the other end of the said cylinder and the said chamber having an auxiliary reservoir connection; of a V-shaped auxiliary slide-valve slidable in a channel in the said valve-chamber, a main valve slidable in the channel of the said auxiliary valve and operatively connected with it, and a piston slidable in the said cylinder and connected with the said main valve, the said casing and valves being provided with ports and passages for placing the brake-cylinder in communication with the atmosphere, the auxiliary reservoir and the train-pipe.

2. In an air-brake valve, the combination,

with a casing provided with a cylinder and a valve-chamber, of a removable valve-seat secured in the said chamber and provided with an angular channel, a V-shaped auxiliary slide-valve slidable in the said channel, a main valve slidable in the channel of the said auxiliary valve, and a piston slidable in the said cylinder and connected with the said main valve, the said valve-seat and valves being provided with ports and passages in duplicate in their side portions for distributing the compressed air.

3. In an air-brake valve, the combination, with a casing provided with a cylinder and a valve-chamber, one end of the said cylinder having a train-pipe connection and the other end of the cylinder and the said chamber having an auxiliary-reservoir connection; of a V-shaped valve slidable in a channel in the said chamber, a second valve slidable in the channel of the aforesaid valve, and a piston slidable in the said cylinder and operatively connected with the said valves, the said casing and valves being provided with ports and passages for distributing the compressed air.

4. In an air-brake valve, the combination, with a cylinder, a valve for distributing the compressed air, and a piston slidable in the said cylinder and operatively connected with the said valve; of a cylinder-cover provided with a spring-chamber, a buffer-spring for arresting the movement of the said piston, plates in the said spring-chamber at the ends of the said spring, a retaining-piece secured to the said cover for one of the said plates to bear against, and an adjusting-screw engaging with the end wall of the said chamber and bearing against the other said plate.

In testimony whereof I have affixed my signature in the presence of two witnesses.

WINFIELD O. GUNCKEL.

Witnesses:

F. E. DAVIS,
JOHN D. BURTON.