(No Model.) 2 Sheets—Sheet 1.

W. J. SMITH.

TRAIN SIGNALING APPARATUS.

No. 494,234. Patented Mar. 28, 1893.

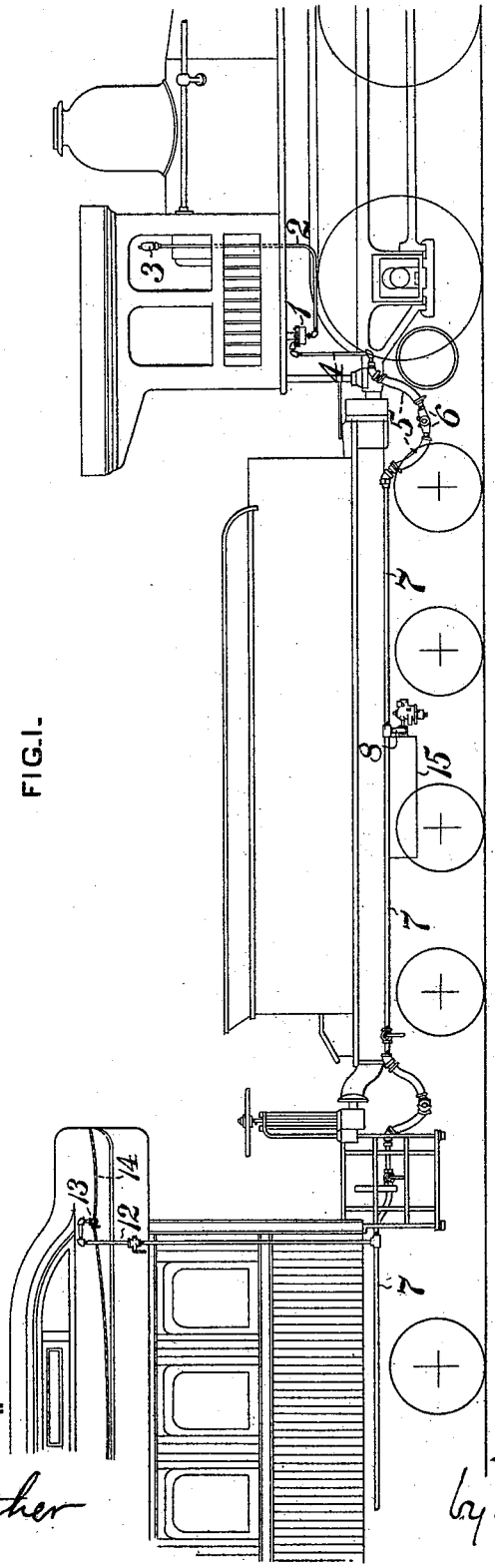

FIG. 1.

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

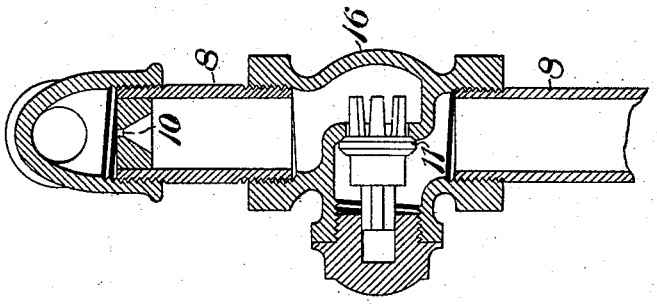
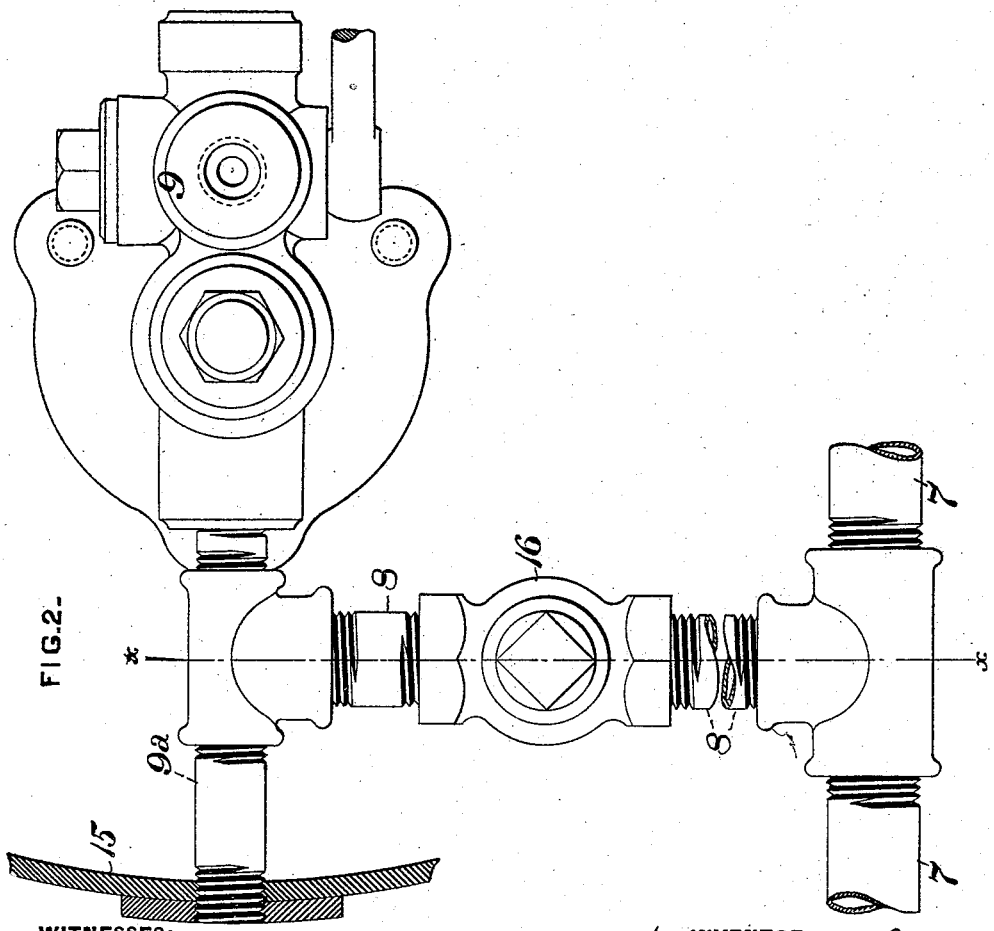


FIG. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM J. SMITH, OF WILKINSBURG, ASSIGNOR OF ONE-HALF TO T. W. WELSH, OF WILMERDING, PENNSYLVANIA.

TRAIN SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 494,234, dated March 28, 1893.

Application filed May 31, 1892. Serial No. 434,905. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. SMITH, a citizen of the United States, residing at Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Train Signaling Apparatus, of which improvement the following is a specification.

The object of my invention is to provide a pneumatic signaling apparatus which shall be of simple construction and at the same time more efficient in operation than any previously existing system of which I have knowledge; and to this end it consists of a new and improved arrangement and connection of the train signal line with relation to the fluid pressure supply, whereby I am enabled to employ a higher degree of pressure in the train pipe and obtain more prompt and decided signals than is possible with existing systems.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings; Figure 1 is a side elevation of a portion of a locomotive, a tender, and portion of a passenger car illustrating an application of my invention. Fig. 2 is a plan view showing the connections through which fluid is supplied to the signal train pipe; and, Fig. 3, a longitudinal section of the branch pipe by which the signal train pipe communicates with the reservoir of fluid pressure supply.

My improvement is designed for use on railway trains equipped with an automatic fluid pressure brake system and is intended for the purpose of signaling to the engineer from any car of the train; but it differs from devices of this class, as heretofore employed, in not being directly connected to the main reservoir which supplies the brake system with fluid pressure. In my improvement the train pipe of the signaling system is connected with the automatic brake system by means of a branch pipe communicating with the auxiliary reservoir on the tender, so that air from the main reservoir, which supplies the brake system, first passes through the triple valve of the tender into the auxiliary reservoir space of the tender and is supplied therefrom past a non-return valve, to the signal train pipe. The signal train pipe may be connected to any other auxiliary reservoir in the train on the reservoir side of the triple valve and a signaling system so connected would be within my invention, but I prefer that arrangement in which the signal train pipe is connected to the auxiliary reservoir of the tender, because the tender is usually kept connected with the locomotive, and if the connection is made to the tender reservoir it will not be necessary to make any changes in cars as at present equipped. By my improvement I dispense with the couplings and branch pipe from the signal train pipe to the main reservoir, and with the separate pressure reducing valve and its connections to the main reservoir. I am also enabled to employ a higher degree of pressure in the signal line than is practicable with existing signaling systems without interference between the pressures in the signal line and the main reservoir, or the main train pipe of the brake system, which might affect the operation of the signal system or the brake system.

In the form shown in the drawings the signal valve, 1, is located on the locomotive, and connected by the pipe 2 to the whistle, 3, or other device for making a signal. The signal valve, 1, is connected by means of the pipe 4, flexible hose 5, and coupling 6, between the locomotive and tender, to the signal train pipe, 7. The train pipe, 7, is connected by means of the branch pipe 8 to the auxiliary reservoir space of the tender. As shown in the drawings this connection is made to a pipe, 9^a, which connects the triple valve 9 with the auxiliary reservoir 15 of the tender, but the branch from the signal train pipe may connect directly to the shell of the tender reservoir, or to that part of the triple valve casing which communicates with the auxiliary reservoir of the tender, so that air from the main air or brake pipe first passes through the feed port of the triple valve before reaching the signal train pipe connection. By this arrangement the triple valve takes the place of the reducing valve which is usually connected to the main reservoir. Air enters, as usual, from the main air or train pipe to one side of the triple valve piston, or diaphragm, and passes into the auxiliary reservoir space and into the branch pipe, 8,

through the contracted passage, 10, unseats the non-return valve 11, in the casing 16, and flows into the signal train pipe, 7, which is connected as usual to the branch pipes, 12, on each car. To each of these branch pipes is attached the usual car discharge valve, 13, having a cord, 14, which the conductor pulls to release air from the train pipe 7. The normal pressure in the signal train pipe, 7, is maintained at substantially the same pressure as the normal pressure in the auxiliary reservoir, 15, of the tender when the train is running and the brakes are off. When the car discharge valve, 13, is opened to release air from the train pipe, 7, the reduction of train pipe pressure produced thereby causes the operation of the signal valve, 1, and a signal is made by the device 3, which may be a device for producing an audible or other signal. In case the reduction of pressure in the train pipe, 7, should be very great and sudden, it is prevented from causing any sudden variation of the pressure in the tender reservoir by making the passage 10 of small capacity and thereby preventing any great volume of air from passing suddenly from the auxiliary reservoir to the train pipe 7.

When the brakes are applied, or after they have been applied and released, and the pressure in the auxiliary reservoir thereby reduced below that in the train pipe 7, the valve 11 is seated by the higher pressure in the pipe 7, and the signaling system is still in condition for operation with a higher pressure than exists in the reservoir 15. The signal train pipe will always have a comparatively high pressure with which to operate the signal, and this pressure will usually be as high as the normal pressure in the auxiliary reservoir of the tender and not at any time below the equalized pressure therein, except when a coupling parts or a considerable leak occurs in the train pipe 7.

I claim as my invention and desire to secure by Letters Patent—

1. The combination of a fluid pressure signaling system, an automatic fluid pressure brake system, and a fluid pressure supply passage from an auxiliary reservoir of the brake system to the train pipe of the signaling system, substantially as set forth.

2. The combination, with a fluid pressure signaling system, of an automatic fluid pressure brake system, and a triple valve device through which fluid under pressure is supplied to the signaling system, and to an auxiliary reservoir of the brake system substantially as set forth.

3. The combination, with a fluid pressure signaling system, of an auxiliary reservoir of an automatic brake system, said auxiliary reservoir being located on the tender of a locomotive and a connection from the auxiliary reservoir of the brake system to the train pipe of the signaling system through which fluid under pressure is supplied to the signaling system, substantially as set forth.

4. In a fluid pressure train signaling device the combination with the signal train pipe, of a passage connecting the train pipe with an auxiliary reservoir of a brake system, and a non-return valve in the passage which prevents the return of fluid from the train pipe to the reservoir, substantially as set forth.

5. In a fluid pressure train signaling device, the combination, with the signal train pipe, of a passage connecting the train pipe with an auxiliary reservoir of a brake system, a non-return valve in said passage and a contracted opening in said passage between the supply reservoir and the non-return valve, substantially as set forth.

6. The combination, with a fluid pressure signaling system, of an automatic fluid pressure brake system, and a valve device having connections to an auxiliary reservoir of the brake system, and to the signaling system, substantially as set forth.

7. The combination with a fluid pressure signaling system, of an automatic fluid pressure brake system, and a valve device through which fluid under pressure is supplied from the train pipe of the brake system, to the signaling system, and to an auxiliary reservoir of the brake system, substantially as set forth.

In testimony whereof I have hereunto set my hand.

WILLIAM J. SMITH.

Witnesses:
T. J. HOGAN,
L. E. LOVE.