

R. C. Huse, Jr.,

Steam Exhaust Mechanism.

No. 113,292.

Patented Apr. 4, 1877.

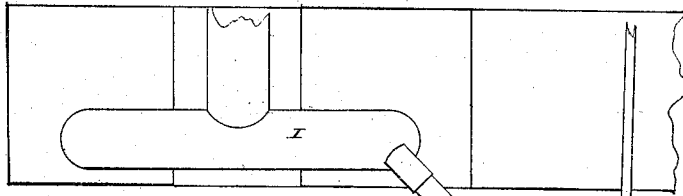


Fig. 1.

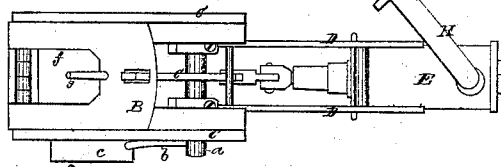


Fig. 2.

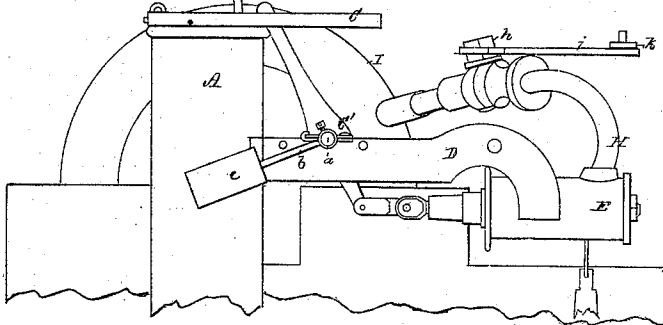


Fig. 3.

Witnesses

S. H. Piper

L. N. Halsey

R. C. Huse

by his attorney

R. W. Day

United States Patent Office.

RALPH CROSS HUSE, JR., OF GEORGETOWN, MASSACHUSETTS.

Letters Patent No. 113,299, dated April 4, 1871.

IMPROVEMENT IN AUTOMATIC APPARATUS FOR OPERATING THE VALVE OF THE EXHAUST-PIPE OF LOCOMOTIVES.

The Schedule referred to in these Letters Patent and making part of the same.

To all persons to whom these presents may come:

Be it known that I, RALPH CROSS HUSE, Jr., of Georgetown, of the county of Essex and State of Massachusetts, have invented a new and useful Automatic Apparatus for Operating the Valve of the Exhaust-Pipe of a Locomotive Steam-Engine; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawing, of which—

Figure 1 is a top view;

Figure 2, a side elevation; and

Figure 3, a vertical and longitudinal section of the said apparatus as combined with a blast-pipe.

In such drawing—

A denotes the blast-pipe, which receives the waste steam from the engine and discharges it into the chimney for the purpose of promoting the draught thereof, and the discharge of the smoke and waste gases.

On the top of the said pipe is a valve or slide-gate, B, arranged to slide horizontally between parallel ways or guides C C, fixed to the top of the pipe.

The upper arm of a lever, C', is extended through a slot in the valve, such lever being arranged as shown, and pivoted to projections D D, extending from the blast-pipe, and serving to support a small steam-engine cylinder, E, provided with a piston, F. The piston-rod is linked to the lower arm of the lever C'.

From the fulcrum or shaft *a* of the lever, an arm, *b*, provided with a weight, *c*, is extended, in manner as shown.

A pipe, H, opens at one end into the steam-cylinder, in rear of the piston, and leads from the pipe I, by which steam is supplied from the boiler of the locomotive to the steam-chest of the engine driving-cylinder.

The pipe H should open out of the supply-pipe I in advance of the main valve of such pipe, in order that, on the instant, or immediately after the said valve may be opened to introduce steam into the steam-chest for the purpose of giving motion to the piston of its cylinder, steam may be caused to flow into the auxiliary cylinder E and operate its piston so as to force it forward and thereby open the valve of the blast-pipe, such valve being closed by the action of the weighted arms the instant, or immediately after, the said main valve may be closed, so as to shut off steam from the chest of the engine-cylinder.

The object of so closing the blast-pipe is to prevent cinders, smoke, or gases from being drawn into the

cylinder or steam-chest when the engine may be next started either forward or backward.

It will be seen from the above that the apparatus works automatically to open and close the valve of the blast-pipe, no attention of the engineer being required to it, for on his opening the main valve to let steam to the engine-cylinder, steam will simultaneously flow into the steam-chest and into the auxiliary cylinder, and the valve of the blast-pipe will be drawn from over it so as to increase it, the closing of the valve being effected at the time of shutting off the steam to the engine driving-cylinder.

Through the valve B is an aperture, *e*, covered by a smaller valve or cover, *f*, which is hinged to the top of the valve B, and is provided with a stop, *g*, to prevent it from rising into a vertical position.

In the pipe H is a cock, as shown at *h*, which is provided with an arm, *i*, extended from its plug.

From this arm *i* a rod, *k*, is to project outside of the smoke-arch, and to a rock-shaft operated by the "link motion" of the engine when the latter is reversed.

The purpose of the small damper or valve *f* is to allow the escape of exhaust steam when the blast-pipe is closed by main damper. The purpose of the cock in the pipe H and its operative mechanism is to shut off steam from the auxiliary cylinder E when the engine is reversed with back steam, the cock being opened when the link motion is next moved forward.

I claim—

1. The arrangement and combination of the auxiliary cylinder E and its piston F, the lever C' and weighted arm *b*, with the blast-pipe A and its valve B.

2. The combination of the auxiliary cylinder E and its piston F, the lever C', and weighted arm *b* with the blast-pipe A and its valve B, the conduit H and the main steam-supply pipe I of the steam-chest of the driving-cylinder of a locomotive-engine, all being substantially as specified.

3. The combination of the aperture *e* and smaller damper or valve *f* and the cock *h*, to be operated as described, with the valve B, the blast-pipe A, and the auxiliary cylinder E, piston F, weighted arm *b*, lever C', and conduit H, connected with the supply-pipe I, all as set forth.

RALPH C. HUSE, JR.

Witnesses:

R. H. EDDY,
S. N. PIPER.