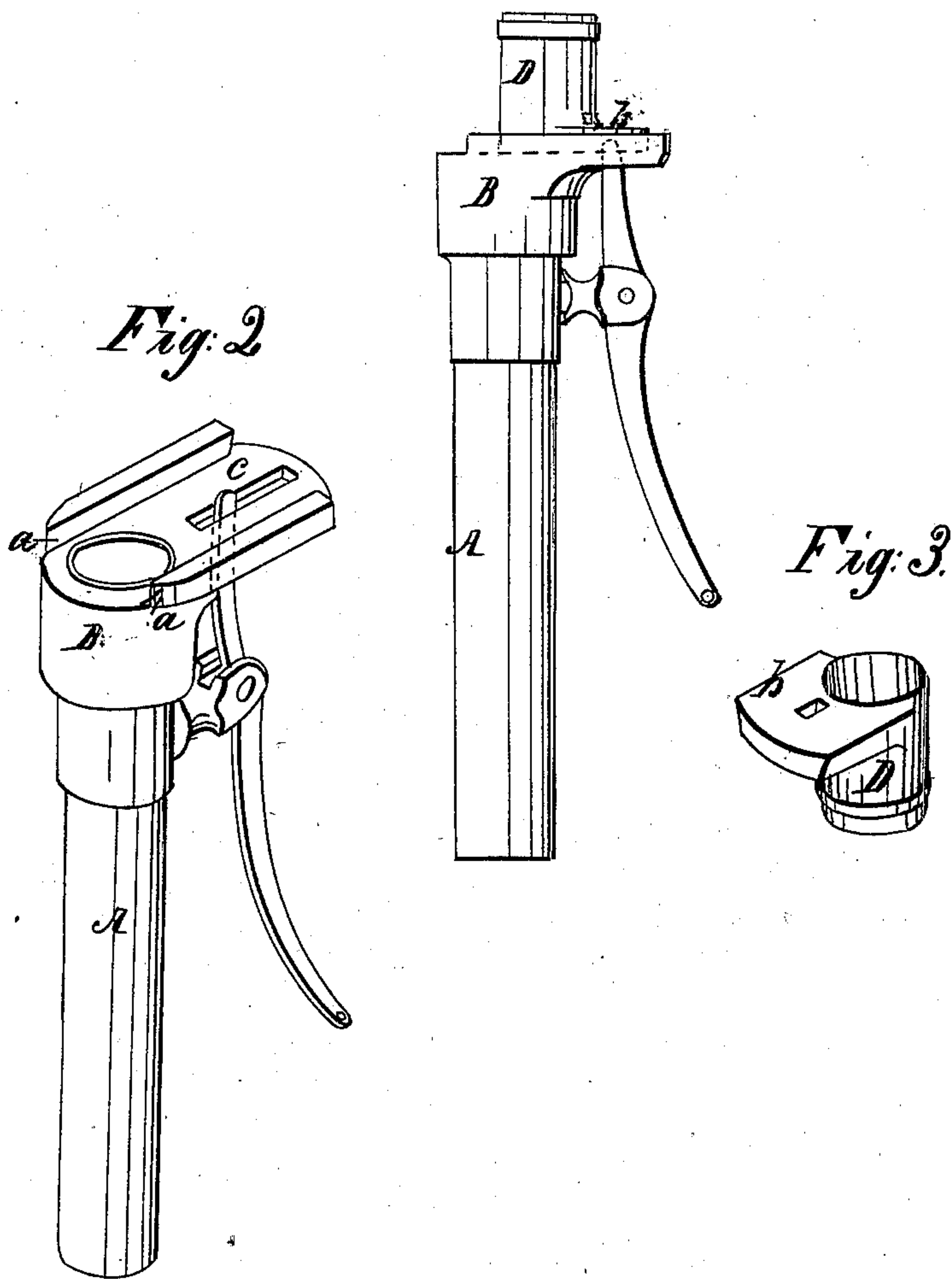


R. Hale,
Steam-Boiler Water-Feeder,
No 17,215, Patented May 5, 1857.
Fig. 1.



UNITED STATES PATENT OFFICE.

ROBERT HALE, OF ROXBURY, MASSACHUSETTS.

MEANS FOR DIRECTING THE EXHAUST OF LOCOMOTIVES.

Specification of Letters Patent No. 17,215, dated May 5, 1857.

To all whom it may concern:

Be it known that I, ROBERT HALE, of Roxbury, in the county of Norfolk and State of Massachusetts, have invented a certain Improvement for Taking Off a Portion of the Exhaust-Steam of Locomotives for the Purpose of Heating Feed-Water, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a front view, Figs. 2 and 3 details which will be referred to hereafter.

The fires of locomotive engines are urged and the draft sustained by causing the exhaust steam to enter the stack through a "blast pipe" having a contracted nozzle in a manner well known and understood. A portion of this steam might in a great majority of cases be spared for the purpose of heating the feed water could it be separated and drawn off without interrupting the current of the rest of the steam or diminishing the force with which it enters the smoke stack. Efforts have been made to accomplish this end by exhausting the steam from the cylinders into a box from which the passage of the steam is regulated by a valve, allowing a portion of it to pass through a pipe to heat the feed water, and the balance to expand into the smoke stack for purposes of draft. For such a plan Letters Patent were granted to Mann and Thing on the 10th March 1838, but the plan is deemed to be imperfect owing to the fact that the momentum of the steam is so far overcome by its entry into the box that the force with which it again expands therefrom into the stack is insufficient to generate the necessary draft.

By my present improvement I am enabled to lead off a portion of the exhaust steam for the purpose of heating the feed water without in the least diminishing the momentum of the balance, or lessening the force with which it enters the smoke stack.

To enable others to understand and use

my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings A, is the blast pipe as it enters the stack for the purpose of producing draft; to the top of this pipe is secured the casting B, which has a hole through it of a diameter equal to that of the end of the blast pipe, and a projection C, with dovetail ways or ledges *a*. In these dove tail ledges slides a block *b*, attached to the bottom of the pipe D, which leads off the steam to heat the feed water—the bottom of this pipe (or one half of it) is made sharp that it may divide the steam without interrupting the progress either of that portion which is drawn off or of the remainder which passes into the stack.

The pipe D, is operated by a lever or other suitable means within the reach of the engineer, who thus has it in his power to take the whole of the exhaust steam for the draft, or to divert the whole or any desired portion of it into the tank for the purpose of heating the feed water.

Where there are two blast pipes, the apparatus may be attached to one only of them, and where the two unite into one, it may be applied to this one in the manner already described.

It should be observed that no material alteration is required in the construction of locomotives to enable my invention to be applied to them.

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

The within described device for the purpose of leading off a portion of the exhaust steam to heat the feed water, without interrupting or changing the direction of that portion of the exhaust not so employed—in the manner substantially as herein set forth.

ROBERT HALE.

Witnesses:

SAM. COOPER,
THOS. R. ROACH.