

H. F. BOODY & E. P. MERRILL.

Feed Water-Heaters.

No. 134,634.

Patented Jan. 7, 1873.

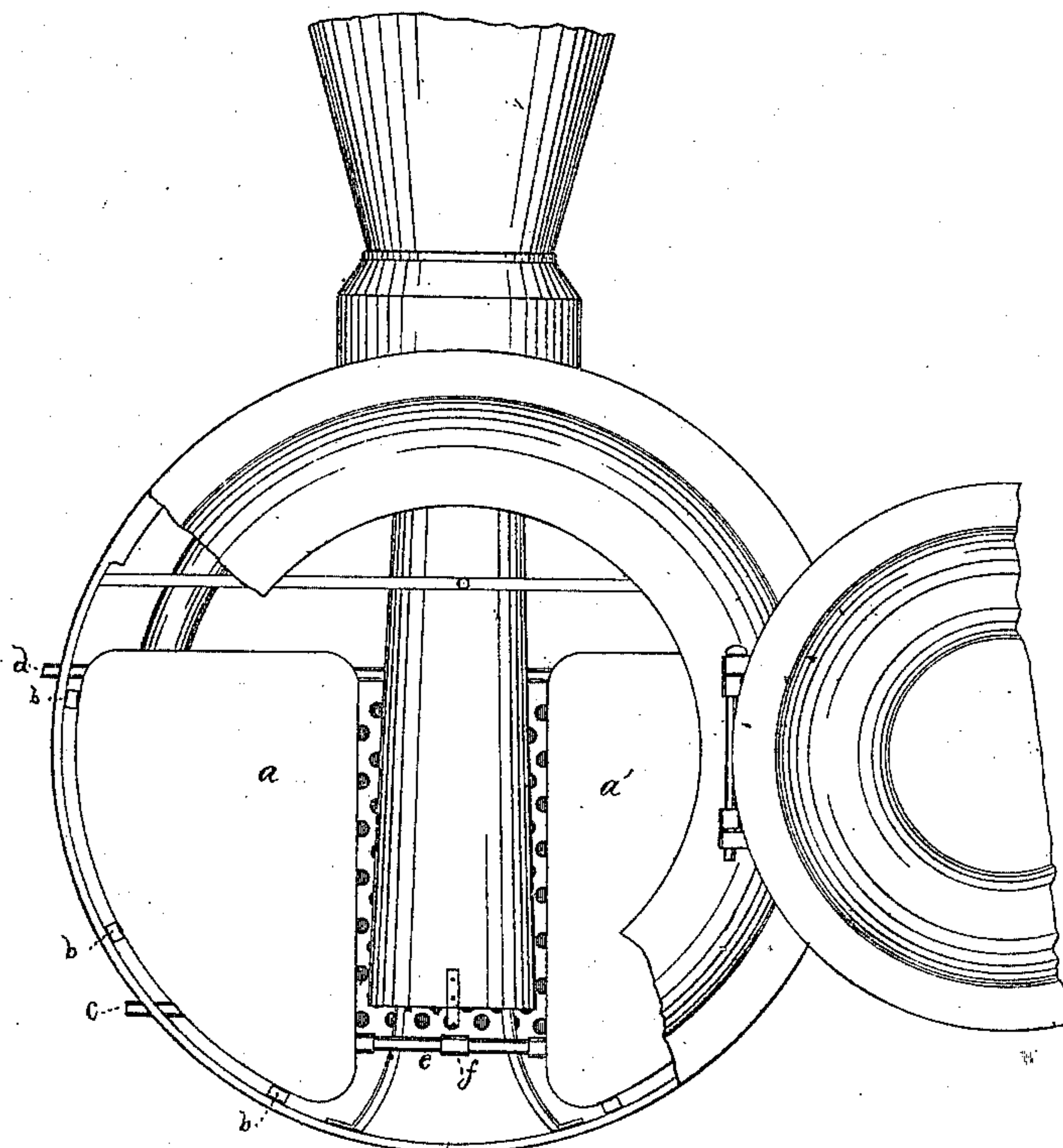


Fig. 1.

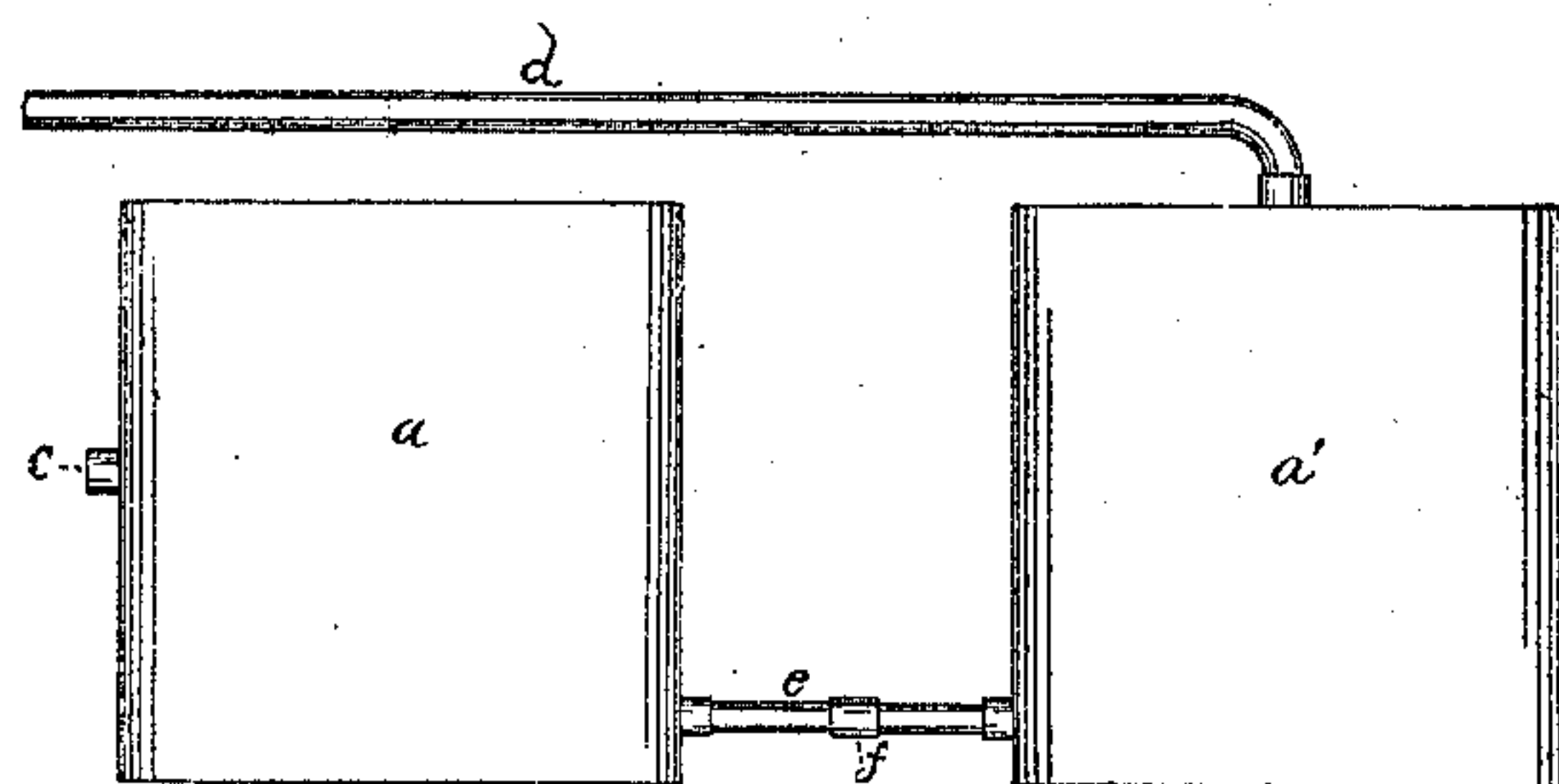


Fig. 2.

Witnesses:

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UNITED STATES PATENT OFFICE.

HENRY F. BOODY AND EDMUND P. MERRILL, OF PORTLAND, MAINE.

IMPROVEMENT IN FEED-WATER HEATERS.

Specification forming part of Letters Patent No. 134,634, dated January 7, 1873.

To all whom it may concern:

Be it known that we, HENRY F. BOODY and EDMUND P. MERRILL, of Portland, in the county of Cumberland and State of Maine, have invented a new and useful Improved Feed-Water Heater; and we hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, which is hereby made a part of this specification, in which—

Figure 1 is a front elevation of a locomotive-boiler, with an end view of our improvement in the position which it is intended to occupy; and Fig. 2 is a top view of our device as seen when removed from the boiler.

Same letters show like parts.

The object of our invention is to produce a device by means of which the water intended to be converted into steam in locomotive and other steam-generating boilers shall have imparted to it, before it is injected into the boiler, a portion of the heat which is now lost by radiation and by being carried out with the draft through the chimney. We are aware that feed-water heaters have been made, but in most, if not all, of the cases, the exhaust steam has been used for this purpose, instead of the direct action of the fire after it has passed through the pipes or flues in the boiler, as we propose to do.

Our invention consists, first, of the two reservoirs *a a'*, Fig. 1, which are made semicircular upon one of their sides in order to better adapt them to the semicircular form of that part of the smoke-arch which they occupy at the end of the boiler. It will be observed that at this point the heat, having passed through the whole length of the boiler, has had its full effect, or all it can have, upon the water contained in the boiler, and is here, by the action of the draft, converged, and to some extent focalized, upon the point which the reservoirs *a a'* occupy. These reservoirs should be made of metal of sufficient strength to withstand the pressure of the water within them, and of such quality as will best resist the action of heat. The supports *b b* are placed under the reservoirs *a a'* to sustain them in their position, and also to allow the heat to surround the reservoirs upon all their sides. Through the pipe *c* the water is brought from the sup-

ply-tank, by pumps, (not shown in the drawing,) but which may be such as are ordinarily used for this purpose, and thence, passing in its course through the reservoirs, is injected into the boiler through the pipe *d*. This arrangement furnishes cold water to the pumps instead of hot, which has been found in many similar cases to be very injurious to the mechanism of the pumps. The reservoirs *a a'* are connected by the pipe *e*, through which the water passes freely from one reservoir to the other. This pipe is divided between the two reservoirs, and connected by the union coupling *f*, for the purpose of more easily separating and removing the reservoirs when desired.

The operation of our invention is as follows: The water being drawn from the supply-tank or other source by the pumps, as before mentioned, is, by the same action, forced continuously forward through the pipe *c* into the reservoirs *a a'*, and injected through the pipe *d* into the boiler. The heat, as before described, acting upon the reservoirs is to some extent absorbed by the water in the reservoirs, and is thus aided in its conversion into steam. The reservoirs *a a'* are not necessarily of the form shown; but we have found this form most convenient to adapt them to boilers of any ordinary construction. The object which we intend to achieve is to hold a quantity of water at the point where the heat from the furnace, having performed its office in the interior of the pipes or flues in the boiler, is about to pass off through the smoke-pipe or chimney, so that as cold water is introduced into one side hot water is driven out from the other and injected by the same impulse into the boiler, the degree of heat to which this water is raised being to a great degree dependent upon the size of the reservoirs and the consequent length of time it remains in them in its course into the boiler.

Our feed-water heater also aids the draft of air through the engine to a very marked and valuable degree by filling up the space in the smoke-arch usually occupied by dead air, so that the air on its passage outward is not diverted into that space, but is directed in its course to follow directly outward to the point of exit.

We are aware of patents issued to Wm. H.

Standeford, August 20, 1872, and D. Matthews, July 17, 1855, and claim none of the devices contained therein; and neither do we claim, broadly, any device for so heating feed-water, but only in the particular form, as herein described.

What we claim as our invention, and desire to secure by Letters Patent, is—

The combination, with the smoke-arch of a

locomotive, of the reservoirs *a a'*, pipes *d c e*, and coupling *f* to form a feed-water heater, when constructed and arranged substantially as set forth.

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EDMUND P. MERRILL.

Witnesses:

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