

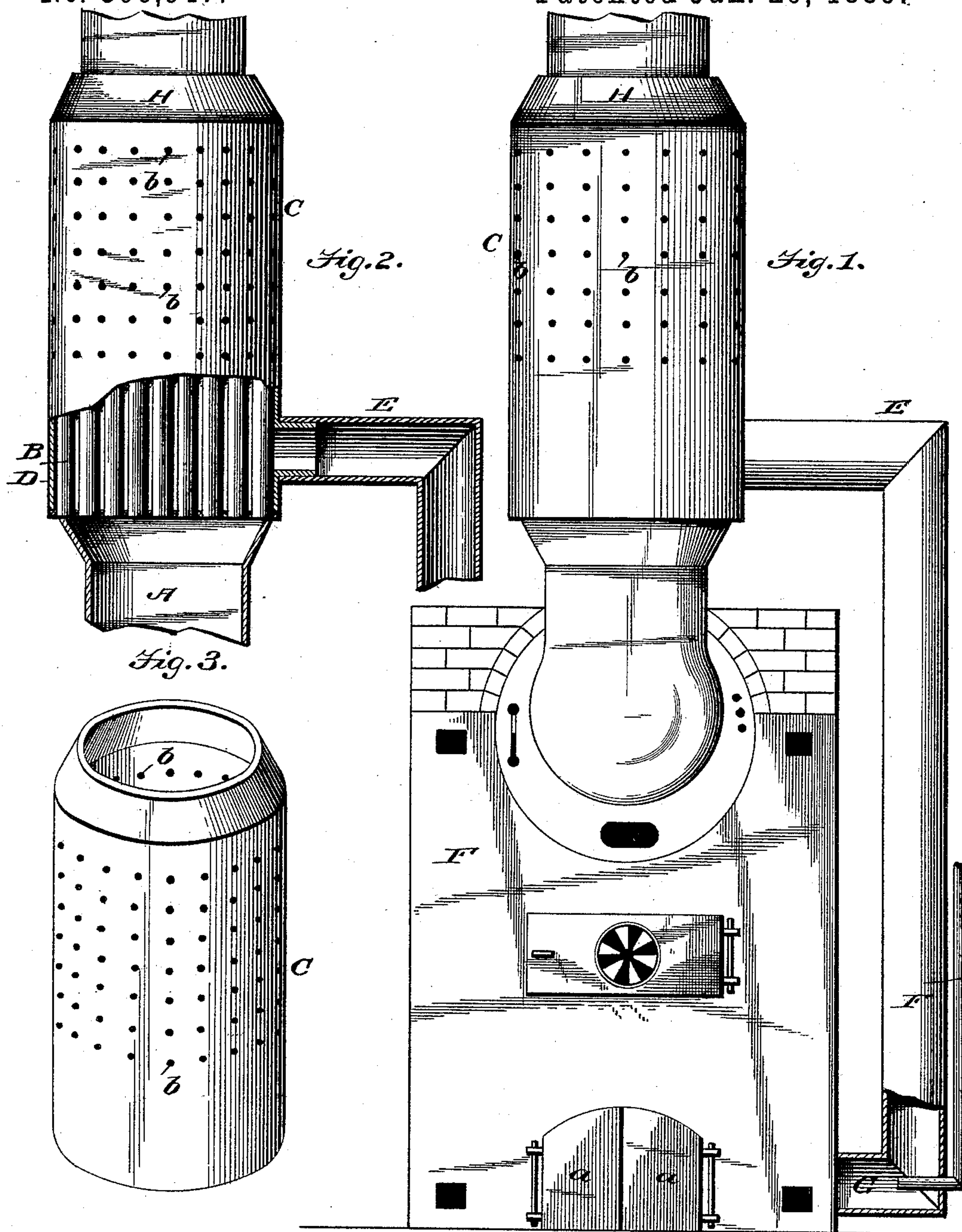
(No Model.)

W. O. MILLS.

HOT AIR BLAST.

No. 396,947.

Patented Jan. 29, 1889.



Witnesses:

J. S. Liskie
J. E. Surpin

Inventor:
Wm. O. Mills.

By, *James J. Sheehy.*
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM O. MILLS, OF SAN FRANCISCO, CALIFORNIA.

HOT-AIR BLAST.

SPECIFICATION forming part of Letters Patent No. 396,947, dated January 29, 1889.

Application filed June 19, 1888. Serial No. 277,604. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM O. MILLS, of the city and county of San Francisco, State of California, have invented certain new and
5 useful Improvements in Air-Heating Apparatus for the Furnaces of Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to means for conducting hot air from a casing surrounding the smoke-stack of a locomotive or engine to the ash-box or beneath the grate by the aid of a jet of steam; and the improvements will be fully understood from the following description and claims when taken in connection with
15 the annexed drawings, in which—

Figure 1 is a front view of a furnace, showing my improvements applied. Fig. 2 is a side elevation, partly in section, of the smoke-stack and casing surrounding the same, with a portion of the pipe which leads therefrom to the ash-pit of the furnace; and Fig. 3 is a perspective view of the jacket or casing removed, with the hot-air connecting-pipe detached.
25

Referring by letter to the said drawings, A indicates a furnace, which may be that of any ordinary or approved construction, having its ash-pit provided with doors *a*. The
30 smoke-stack, which properly leads from the furnace, is composed of tubes B for carrying off the smoke and particles of combustion, and arranged at intervals so as to form between and around them air-passages D. Surrounding these smoke-tubes is a tubular casing, C,
35 which is provided in its body with apertures *b* for the introduction of cold air, and this casing surrounds the said tubes B for a sufficient portion of their length. It should be
40 observed that this perforated jacket or casing may be applied to any tubular smoke-stack; or, in fact, any smoke-stack—such as at present in use—without altering the construction of the latter in any manner whatever;
45 and to this feature of construction I attach considerable importance.

In applying the jacket or tubular casing it is simply necessary to slip the same down upon the stack to the base thereof, the upper

portion of the said casing being contracted, 50 as shown at H, will approximately engage the outer surface of the stack and thereby retard the free egress of the radiated heat.

E indicates a pipe, which leads from a suitable point at the base of the casing surrounding the smoke-tubes to the ash-pit beneath the fire-box, as shown at G, so that the cold air which enters the casing through the perforations *b* therein and has become heated by contact with the smoke-tubes may be conducted to the ash-pit and there discharged to feed the fire and promote combustion. 55 60

F indicates a steam-pipe, which enters pipe E at its point of connection with the ash-chamber. It will thus be seen that by the injection of a jet of steam into this pipe E where it connects with the ash-chamber the air, as it is heated in the smoke-stack, will be drawn down through the pipe E and forced into the ash-chamber beneath the fire-grate. This operation will take place when the doors to the ash-chamber have been closed and cold air thereby excluded from the fire-chamber. 65 70

I am aware that it is not new to feed heated air to a fire in a furnace while excluding cold air therefrom, and that air, superheated steam, and hot gases arising from the combustion-chamber have been forced into the fuel to aid in its combustion. 75 80

By this invention it will be seen that the improvements may be applied to any ordinary locomotive-engine without altering its construction in any manner whatever, it being simply necessary to slip the perforated jacket C over the smoke-stack and communicate the same with the ash-chamber of the furnace by means of the pipe E. 85

Having described my invention, what I claim is— 90

The combination, with a furnace, of the smoke-stack composed of tubes B, for the passage of smoke and particles of combustion, the casing C, surrounding the said tubes and having perforations *b* entirely around the same at its upper portion for the inlet of cold air, which passes around the smoke-tubes, and also having its upper end con- 95

tracted to approximately bear against the
outer surface of the stack, the pipe E, lead-
ing from the lower portion of the said casing
below the perforations to the ash-pit of the
5 furnace, and the steam-pipe F, entering the
said pipe E at its point of connection with
the ash-pit, whereby a jet of steam may be

thrown to draw the heated air in the smoke-
stack or its casing into the ash-pit beneath
the fire, substantially as specified.

WM. O. MILLS.

Witnesses:

WM. LUTHER,
JOHN MILLS.