(No Model.)

W. S. HUTCHINSON.

FURNACE AND ATTACHMENT THEREFOR.

No. 480,328. Patented Aug. 9, 1892.

Fig. 1.

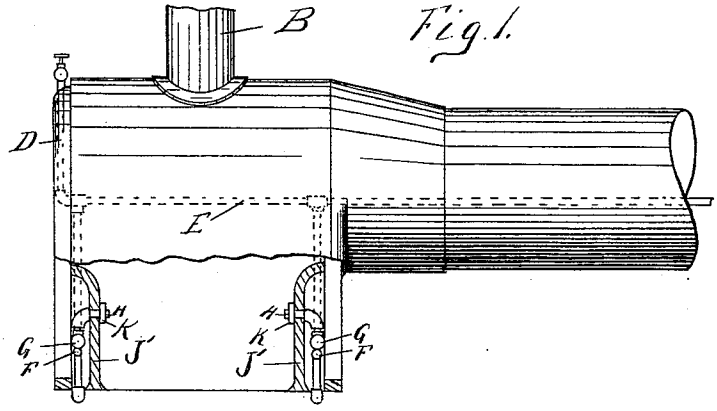


Fig. 2.

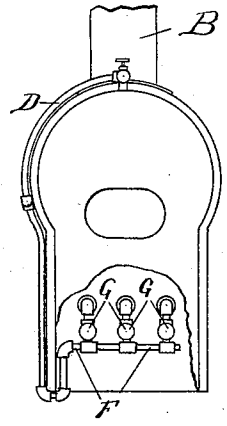
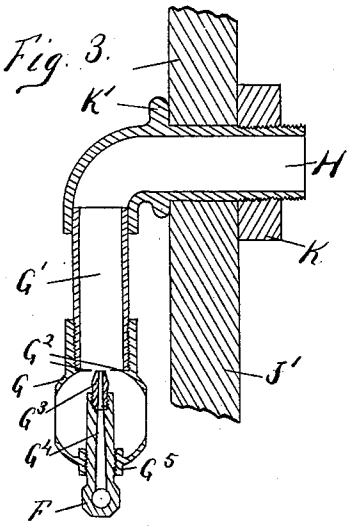


Fig. 3.



Witnesses

Inventor

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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FURNACE AND ATTACHMENT THEREFOR.

SPECIFICATION forming part of Letters Patent No. 480,328, dated August 9, 1892.

Application filed September 9, 1891. Serial No. 405,178. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. HUTCHINSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Furnaces and Attachments therefor, of which the following is a specification.

My invention relates to improvements in devices for the production and combustion of water-gas in locomotive and marine boilers, and has for its object to provide simple and convenient means whereby the same may be applied to a locomotive or marine engine fire-box.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side view of a locomotive-boiler and fire-box with my improvement attached. Fig. 2 is an end view thereof. Fig. 3 is an enlarged detail view showing the parts and their relation to each other.

A is the furnace, and E is a steam-pipe, which passes forward from the pipe D and is adapted at its forward end to discharge into the base of the smoke-stack, so as to furnish an artificial draft, if desired.

H is a pipe which passes through the plate J′ or sleeve J. The sleeve is set in the side of the furnace-wall, passes through the water-space, is put in with an expander, and beaded down at both ends. This pipe H is held in position by the nut K, so that the steam and air may be discharged from the injector G into the furnace-chamber. There is a flange K′ on the pipe, to which the nut is opposed.

The form of the injector is shown in Fig. 3, where F represents a pipe provided with a series of short lateral pipes G^4, terminating each in the tip G^3 within the surrounding globe G^5. Projecting from this globe is the pipe G′, and transversely disposed within the same is a centrally-perforated diaphragm G^2. The steam is discharged from the tip G^3 and the air passing in through the side apertures of the globe is forced by the rush of steam through the pipe G′ into the furnace. These injectors may be placed outside the furnace, and the connecting-pipes may then be passed through the water-jacket, as shown in Fig. 3; but I prefer to place or attach inside the furnace or ash-pit space the plate J′, cast or otherwise formed. The same may be part of the wall in a permanent setting, as of course this general construction could be employed, also, in stationary engines. In this case the pipe D comes down about the edge of the furnace and passes up to contact with the pipe F, which, with the injectors, lies between the furnace-wall and the plate.

The use and operation of my invention are as follows: The steam discharging through the pipe D passes into the pipe F, where it is distributed along and discharged through the several pipes G^4 G^4, which form each a part of an injector. These several pipes terminate in gradually-contracted apertures, as shown, which open near the opening in the diaphragm G^2 and thence discharge into the pipe G′. By this means a great quantity of air will be drawn in with the steam and forced through the pipe into the fire-box. At the same time in like manner by similar means air and steam will be injected into the other side of the fire-box. The steam may also be forced through the pipe E, as indicated, into the smoke-stack to facilitate a draft.

I claim—

In a furnace for locomotive and marine boilers or the like, the combination of interior vertical plates with injectors located in the space between such plate and the furnace-wall, a pipe leading from such injectors, passing through the plates, and opening into the furnace, and a steam-pipe passing down the outside of the boiler and furnace and up between such plate and the inner wall of the furnace to the injector, substantially as shown and described.

WILLIAM S. HUTCHINSON.

Witnesses:
CELESTE P. CHAPMAN,
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