A. J. Stevens,

Boiler Furnace.

No. 111,884. Patented Feb. 14, 1871.

FIG 1

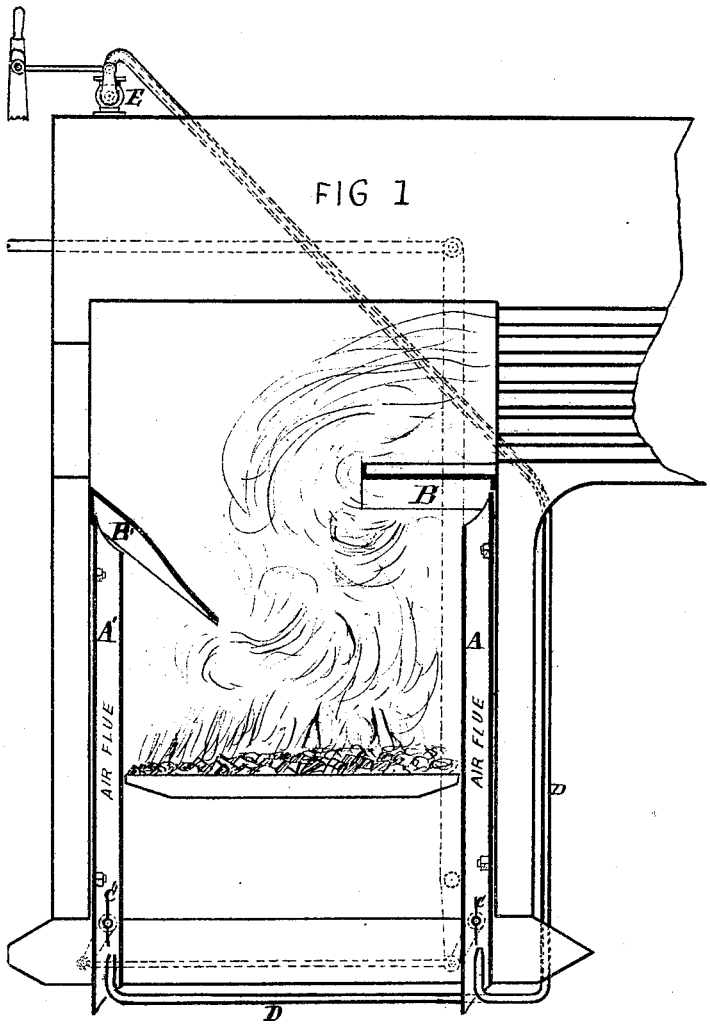


FIG 2

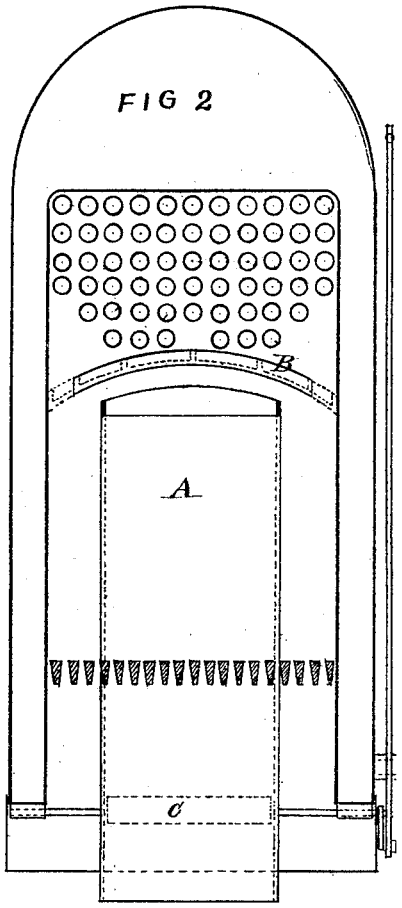
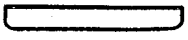


FIG 3



Witnesses

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UNITED STATES PATENT OFFICE.

ANDREW J. STEVENS, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN LOCOMOTIVE-BOILER FURNACES.

Specification forming part of Letters Patent No. **111,884**, dated February 14, 1871.

To all whom it may concern:

Be it known that I, ANDREW JACKSON STEVENS, of the city and county of San Francisco, State of California, have invented a certain new Improvement in Locomotive and other Boiler Furnaces, of which the following is a specification.

This invention consists in providing certain flues for admission of air to the furnace, in combination with certain deflector-plates to direct the air-draft into the fire for the purpose of assisting combustion; and also in conducting a jet of steam from the boiler to the interior of the furnace to dampen or smother the fire and prevent the emission of smoke at such times as the production of steam may be stopped.

In the accompanying drawings, Figure 1 is a longitudinal section of the furnace of a locomotive-shaped boiler with my invention applied thereto. Fig. 2 is a cross-section of the same. Fig. 3 is a sectional plan of the air-flues.

Against the back end of the furnace-box I secure by bolts an air-flue, A, opening from below just underneath the ash-pan, and conducting the air upward to just below the bottom row of tubes in the boiler. Here the air strikes an arched deflector, B, set, as shown in drawings, at about a right angle with the end of the furnace-box; or it may slant upward, if desired, and is deflected into the fire, and mixing with it materially aids combustion, and in a measure prevents smoke from arising. Another flue, A′, is supplied at the front end of the furnace, and also another deflector-plate, B′, just above it. The action is similar, as before described. The deflector B′ does not, like its opposite neighbor, sit at right angle to the end of the furnace, but sits upon a slant downward, in manner as shown in drawings. Deflector B will be arching, as in Fig. 2, and may be covered with fire-clay, tiles, or even bricks to keep it from being burned out by the fire. It may be six or eight inches less in width than the furnace, so that the flames may produce their best effect—a matter practice will best decide.

The front deflector, B′, need not be covered with fire-clay, for it is not so liable to burn out as deflector B. It may, however, be still less in width than deflector B, because it will be necessary to pass the fuel between its ends and the sides of the furnace. About eight inches may be left between each end of the deflector and the side of the furnace.

Dampers C and C′ will be provided in both air-flues, and on locomotives these will be connected and operated with the cut-off gearing, so that air will be supplied and cut off in direct proportion as steam is supplied and cut off from the cylinders, any convenient connection being made, accordingly as the construction of the engine will permit. I also provide for admitting steam into the furnace at such times as it may be desirable to dampen the fire and prevent the smoke from rising.

D is a pipe leading from the steam-space in boiler to lower entrance of one or both flues. (See Fig. 1.) A cock or valve, E, supplying this pipe, will be connected to the throttle-valve handle by some simple connection, or it may be operated independently, so that when steam is cut off from the cylinders steam will be let into the furnaces to dampen the fires for purpose as before stated.

Deflectors, or, as they are more frequently called, "baffle-plates," have been applied in furnaces, but not in the manner I have applied them. For instance, some English and many American locomotives carry a removable baffle-plate, somewhat like a large scoop coal-shovel, which just fits the furnace-door opening, and projecting into the furnace, slanting downward from the top of the opening, deflects a draft from the outside into the fire. This device has an awkward long handle which sticks out into the cab of the locomotive to the inconvenience of engineer and fireman; and, also, it is objectionable on account of its being necessary to leave the furnace-door open when it is in use, permitting both smoke and the brilliant light of the fire to seriously interfere with the operations of the engineer. With my device the door of furnace need not be open. There are also brick arches provided in locomotive fire-boxes, which are used to deflect the flames and prevent them from passing into the tubes too directly. Although my deflector-plates will answer in the place of these brick arches, and in part may be considered an equivalent, still they act in combination with each other, there being two, and also in combination with the flues B and B′, and for the purpose entirely new and not belonging to any

other device. I may, if I desire, use the flues and deflectors singly or in combination, as the construction and size of the furnace will permit.

I claim—

1. The flues A A, with dampers C C′, in combination with the deflecting-plates B B′, as and for the purposes set forth.

2. In combination with the foregoing, the steam-jet pipe D, as and for the purposes set forth.

ANDREW J. STEVENS.

Witnesses:

GEORGE PARDY,

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