(No Model.)

A. J. SIMMONS.

Attachment for Furnace Doors.

No. 241,433. Patented May 10, 1881.

Fig. 1.

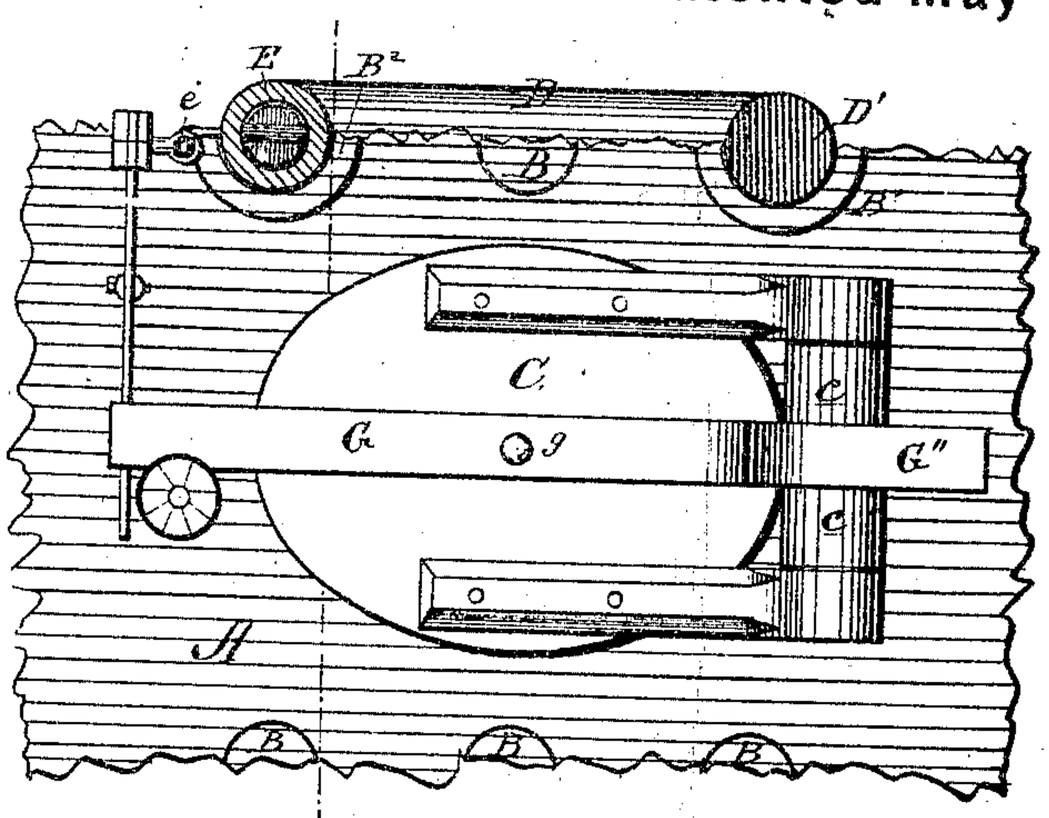


Fig. 2.

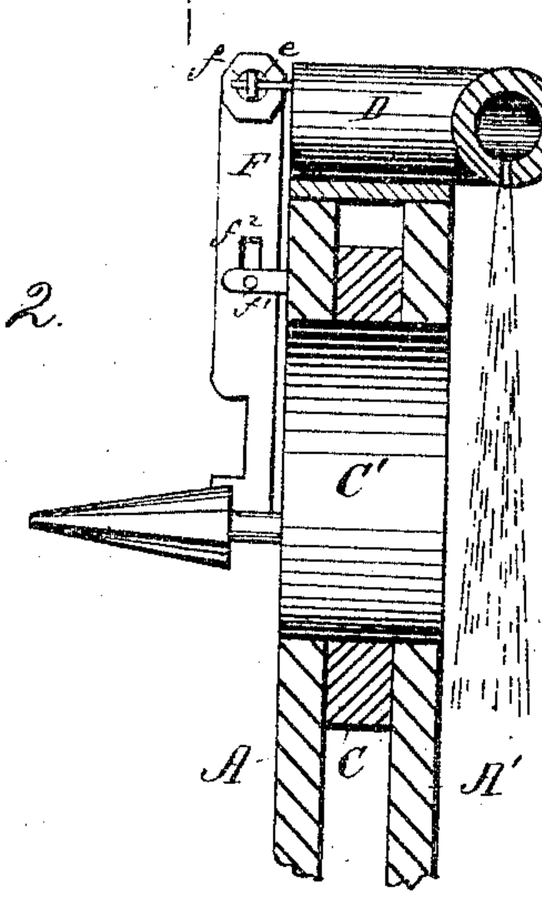
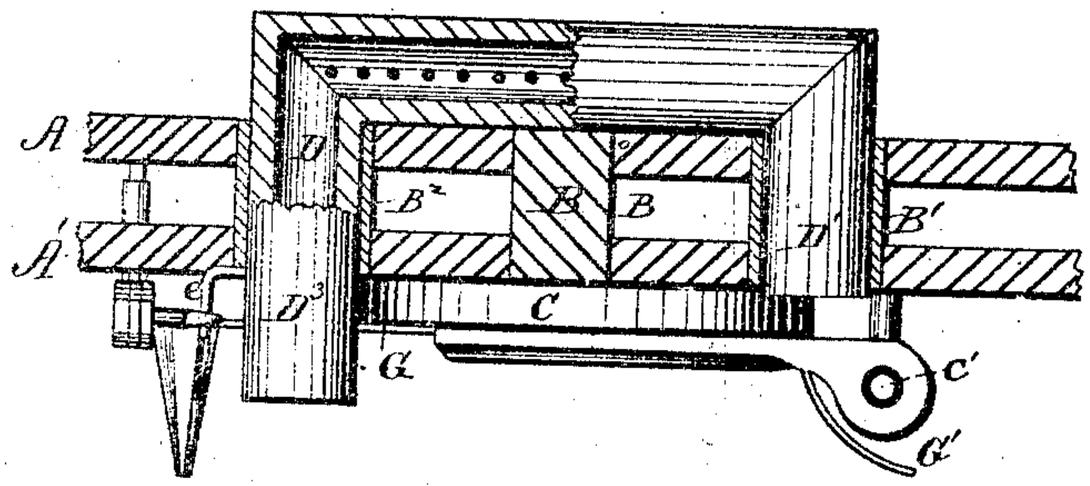


Fig. 3.



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ALONZO J. SIMMONS, OF RAYSVILLE, INDIANA.

ATTACHMENT FOR FURNACE-DOORS.

SPECIFICATION forming part of Letters Patent No. 241,433, dated May 10, 1881.

Application filed October 7, 1880. (No model.)

To all whom it may concern:

Be it known that I, ALONZO J. SIMMONS, of Raysville, Henry county, Indiana, have invented a certain new and Improved Attachment for Furnace-Doors; and I do hereby declare that the following is a full, clear, and exact description of the same.

It is well known that the process of combustion in boiler-furnaces is greatly retarded by opening the furnace-door, which will admit large volumes of cold air to flow across the burning fuel and chill the flame to a degree which will not properly support combustion, and numerous devices have been employed for feeding coal to the interior of the furnace through passages which exclude the outer air, but obstruct the opening for the door, so that immediate access to the bed of coal upon the grate is obstructed.

The object of my invention is to prevent the flow of cold air into the furnace through the door by a simple means which may be applied to any furnace of ordinary construction, and will in no way interfere with access to the burning coals upon the grate, to feed the furnace, to properly distribute the fuel over the fire-bed, or for other purposes; and the improvement consists, first, in the combination, with a furnace, of a pipe arranged above or around the door-opening that communicates with the steam-space of the boiler, and is provided with a valve to regulate the admission of steam to the portion of the pipe within the furnace, the said inner portion of the pipe being perforated in such manner as to direct the steam escaping through the perforations across the door-opening in a sheet, which will screen the inner air of the furnace from the outer air, and warm the air that may pass through it to such a degree that its admission to the burning coal within the furnace will not chill the flame and prevent its effectual combustion.

My invention further consists in connecting the valve of the steam-pipe, combined with a furnace, as above described, with the latch of the furnace-door, in such manner that when the latch is raised to open the door the valve will be opened to admit steam through the perforations of the pipe, and when the latch is closed the valve will also be closed to shut off the steam and prevent its unnecessary consumption.

In the accompanying drawings, Figure 1 is a front elevation of a furnace-door and a portion of the furnace and its steam-pipe connections; Fig. 2, an elevation of the inner side of the furnace-wall, showing the steam-pipe partly broken away; and Fig. 3 a horizontal section through the furnace-walls, showing a plan view of the attachment with a portion of the steam-pipe broken away.

The furnace is of the ordinary construction, provided with outer plate, A, and inner plate, A′, connected together in a well-known manner by stay-bolts B.

A furnace-door, C, fits into and covers the door-opening C′, which is incased by shell C^2, and the door is hinged to ears *c c* by bolts *c′*, or in any suitable manner.

A steam-pipe, D, with elbows D′ D^2 at each of its ends, is arranged horizontally above the furnace-door, so that the body D of the pipe will extend entirely across the door-opening, and the lower portion of the pipe is perforated to direct the steam vertically in a sheet across the inner face of the furnace-walls, immediately in front of the furnace-door. The elbow D′ of the steam-pipe is closed by a plug, and simply serves to support one end of the pipe by passing through a hollow stay-bolt, B′, connecting the double plates of the furnace. The other end of the pipe D is similarly supported by an elbow, D^2, passing through a hollow stay-bolt, B^2, and is provided with a valve, E, arranged to cross its opening and be operated upon through a crank-shaped valve-stem, *e*, to admit steam to the pipe D from the pipe D^3, that connects the hollow elbow D^2 with the steam-space of the boiler.

A plate, F, provided with an eyebolt, *f*, at its upper end and notched at its lower end, is arranged to slide vertically against the outer wall of the furnace, and is held in place by a pin, *f′*, secured to the furnace-walls, that passes through a longitudinal slot, f^2, in the plate. The plate F is connected with the valve E by the crank *e*, passing through the eyebolt *f*, and is connected with the door-latch by passing through the notch f^2 in its lower end.

The latch G is pivoted to the door by bolt *g*,

and extends entirely across the door. The end G′ of the latch is bent around the hinge of the door, and affords convenient means for raising the latch from the head or jaw of the hook secured to the furnace-plate.

It will thus be seen that when the latch is raised to open the furnace-door the bar valve-stem *e* and valve E will be lifted to admit steam into the pipe D, and allow it to pass through the perforations of the pipe and be driven across the furnace-door opening in a sheet, and in such quantities that the door-opening will be screened to exclude the outer air from entering the furnace through the door-opening in large volumes, and will heat the air that does enter to such temperature that the combustion of the fuel in the furnace will not be checked by the cooling effect of air at a low temperature. By this means the furnace-door can be left open a reasonable time to allow the coal to be properly distributed upon the grate-bars, and for removing clinkers or other non-combustible material from the furnace without killing the fires and allowing drafts of cold air to sweep across the furnace and through the flues and inner passages of the boiler, which would quickly reduce the temperature of the water and steam within the boiler, and cause not only a loss of fuel, but a decreased steam pressure and volume, with a consequent loss of speed of the engine.

In locomotive-engines the reduction of speed caused by opening the furnace-door is a serious detriment, and by the above-described means may be avoided almost totally.

By detaching the valve-stem *e* from the eye-bolt *f* the valve may be operated independently of the door-latch, if desired.

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

1. In a furnace for steam-boilers and similar purposes, the combination of a perforated steam-pipe arranged within the furnace near the door-opening and connected with the steam-space of the boiler, and a valve to regulate the admission of steam to the perforated portion of the steam-pipe, the steam-pipe being arranged to direct a sheet of steam across the furnace-door opening, substantially as and for the purpose described.

2. The combination, with the furnace of a steam-boiler, of a perforated steam-pipe arranged within the furnace in such manner as to direct the steam across the inner face of the door-opening, and a valve for regulating the admission of steam to the perforated pipe that is connected with the door in such manner that when the door is opened or closed the valve will be correspondingly operated through the connecting mechanism, substantially as described.

3. The combination, with the furnace, of the perforated steam-pipe D, valve E, vertical rod, and door-latch, pivotally secured midway of its length to the door, and projecting beyond it in such manner that one end of the latch may afford convenient means for actuating the rod E at its other end, substantially as and for the purpose described.

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Witnesses:
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