

F. REIMHERR.  
Locomotive-Boiler Furnace.

No. 202,375.

Patented April 16, 1878.

Fig. 1.

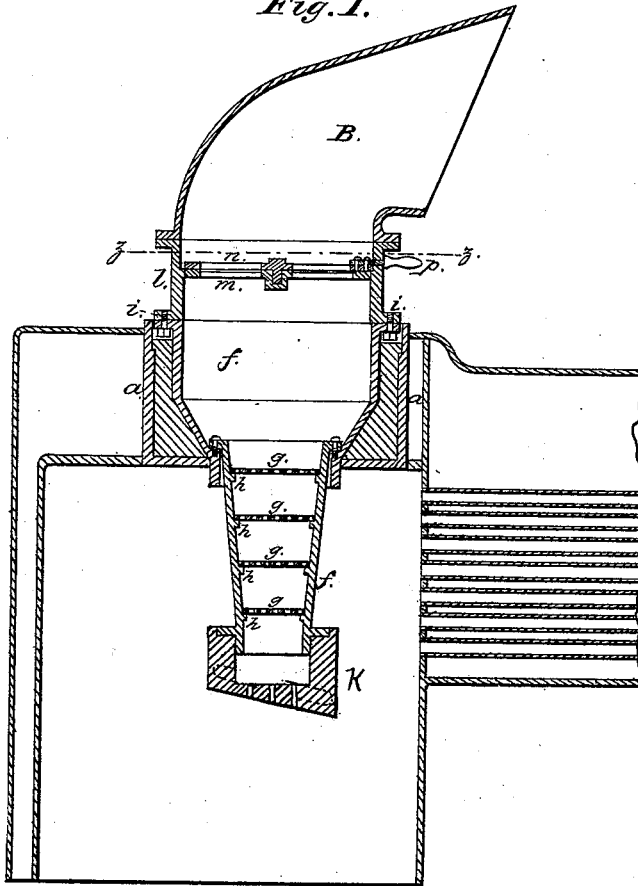


Fig. 2.

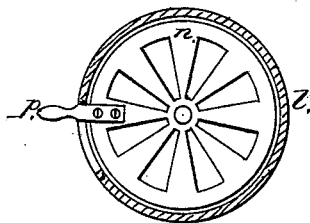
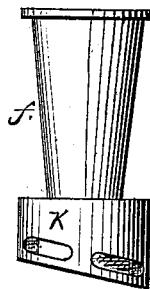


Fig. 3.



Witnesses:

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# UNITED STATES PATENT OFFICE.

FREDRICK REIMHERR, OF MUNICH, BAVARIA, GERMANY.

## IMPROVEMENT IN LOCOMOTIVE-BOILER FURNACES.

Specification forming part of Letters Patent No. **202,375**, dated April 16, 1878; application filed August 7, 1877.

*To all whom it may concern:*

Be it known that I, FREDRICK REIMHERR, of Munich, Bavaria, Germany, have invented certain Improvements in Locomotive-Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a longitudinal vertical section through the fire-box of a locomotive-boiler, showing the flaring hood B, the air-regulating disks *m n*, the distributor *f*, with its tapering downwardly-projecting nozzle, and the perforated nozzle K, the outer cylinder *a*, and the refractory packing material, and the air-heating perforated diaphragms *g*, resting on the shoulders *h*. Fig. 2 represents a horizontal section on the line *z z*, showing a plan of the air-regulating disks *m n*; Fig. 3, a detached view, in elevation, of the distributor *f*, with its sloping nozzle K.

My invention has for its object to so improve the construction of locomotive-boiler furnaces as to effect a great saving in fuel, and at the same time prevent smoke; and my invention consists in certain details of construction, as hereinafter set forth and specifically claimed.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, *a* represents a cylinder made of boiler-plate. Within this cylinder *a* is suspended another cylinder or air-distributor, *f*, composed of fire-clay or other suitable material, the space between the cylinder *a* and the upper portion of the cylinder *f* being filled with fire-clay or other suitable material capable of resisting the action of intense heat. The lower end or nozzle K of the cylinder *f*, which slopes obliquely on each side, as seen in Fig. 1, is provided with perforations through which the air is injected in jets or streams, and thus caused to impinge upon and become thoroughly commingled with the smoke and gaseous products of combustion evolved from the burning fuel below. The external air, as it passes through the cylinder *f*, and before it enters the fire-box, is heated by means of perforated plates *g* of fire-clay or

other suitable material, inserted in the cylinder, and arranged at suitable distances apart. These plates *g* rest on the shoulders *h* projecting from the interior of the cylinder, and by thus heating the air previous to its introduction into the fire-box, it is prevented from cooling the burning gases with which it is mingled. To prevent the turning of the cylinder *f*, it is provided with lugs or projections *i*, which enter recesses adapted to receive them.

On the iron cylinder *a* is secured a cast-iron casing, *l*, across the interior of which extends a division-plate, *m*, provided with openings for the passage of the air, the admission of which is regulated by a movable circular plate, *n*, fitted over the plate *m*, and provided with openings corresponding to those formed in the plate *m*, the plate *n* being moved by a lever, *p*.

To the top of the casing *l* is secured a curved bell-mouthed tube or flaring hood, B, which serves to catch the air when the locomotive is in motion, and direct it down into the air-distributor *f*, the tube being movable around its vertical axis in order to allow of its mouth being turned in the direction of the motion of the locomotive.

From the foregoing it will be seen that the progressive motion of the locomotive causes the air to be forced into the air-catcher B and down into the air-distributor *f*, from the perforations at the lower end of which it is naturally injected and evenly dispersed over the surface of the burning fuel below, producing complete combustion, and effecting a great saving in fuel. Furthermore, smoke is prevented, and the emission of sparks in a great measure avoided.

By the introduction of the air-distributing cylinder *f*, as above described, the diameter of which is almost equal to the breadth of the fire-box top, the pressure on the latter will be reduced one-half, it being one of the most important considerations in the construction of locomotives to protect the fire-box top against the pressure exerted on it. This construction can be adapted to boilers where the upper fire-box top is not flat but semicircular, and can be applied to all locomotives without taking out the fire-box.

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

1. The combination, with the fire-box of a locomotive-boiler, of the air-distributing device projecting vertically into the furnace, and provided with air-heating perforated diaphragms and a perforated spraying-nozzle, arranged to operate as herein set forth.

2. The combination of the air-distributer *f*, provided with perforated air-heating diaphragms *g*, and the adjustable flaring hood B, in the manner and for the purpose set forth.

3. The combination of the air-distributer *f*, the adjustable hood B, the registering-disks *m n*, and the sloping perforated nozzle K, arranged and operating substantially as described.

4. The air heating and distributing device *f*, having an enlarged upper chamber and a tapering downwardly-projecting nozzle, provided with perforated diaphragms, and the cylinder *a*, packed with refractory material, combined and arranged to operate in the manner and for the purpose specified.

Witness my hand this 22d day of June, 1877.

FR. REIMHERR.

In presence of—

G. HENRY HORSTMANN,  
T. HÜBSCHIEDEN.