

(No Model.)

L. M. G. DELAUNAY-BELLEVILLE.  
GRATE FOR STEAM BOILER FURNACES.

No. 549,446.

FIG. 1 Patented Nov. 5, 1895.

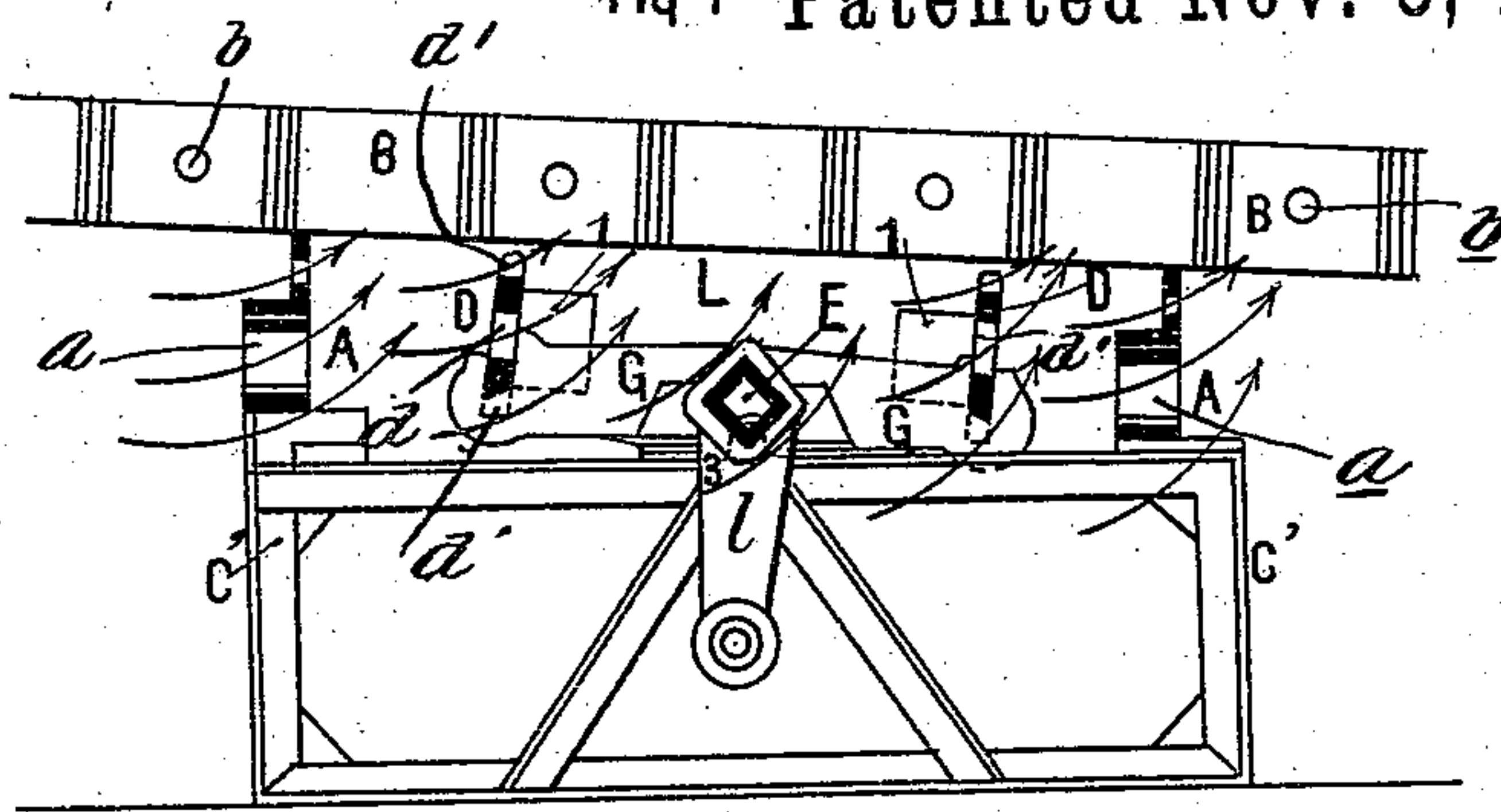


FIG. 2.

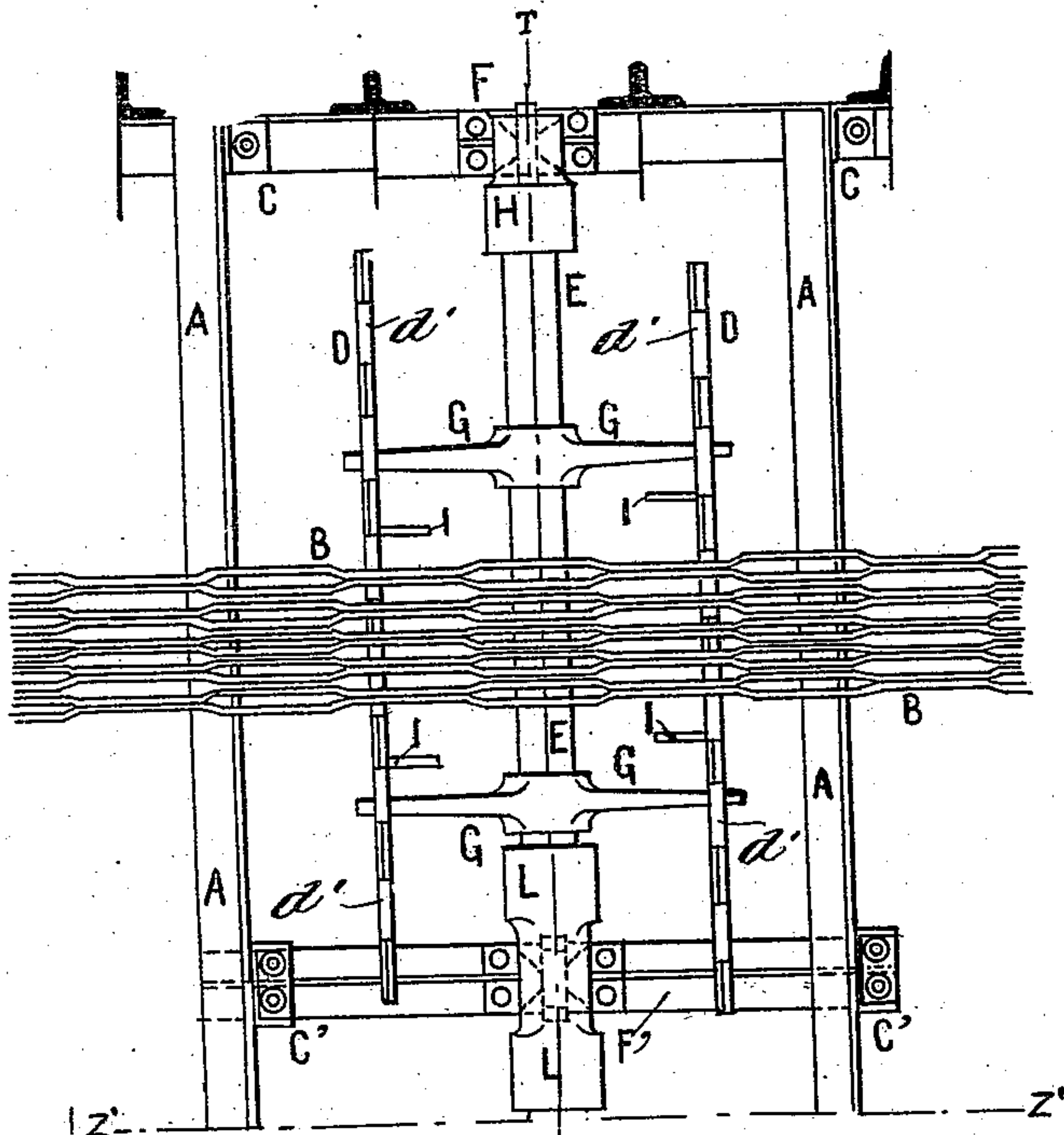
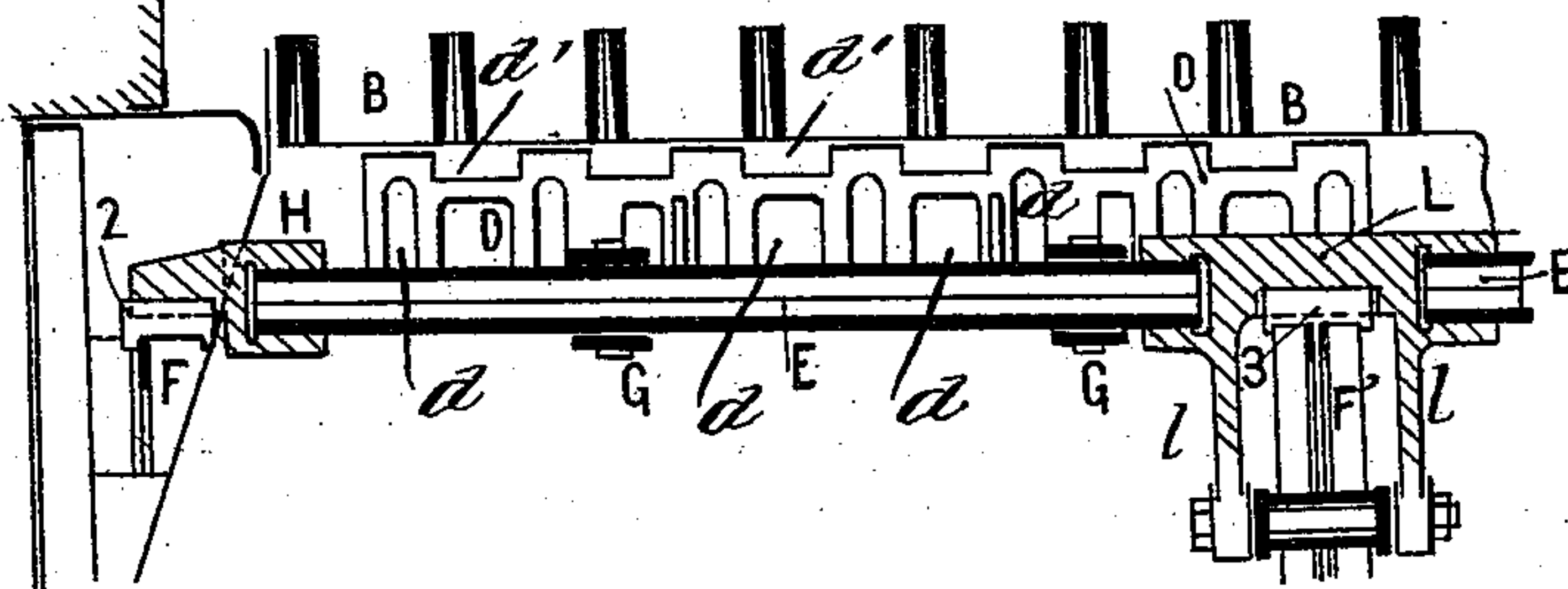


FIG. 3.



Witnesses

G. W. Rea,  
Thos. A. Green

Inventors

Louis M. G. Delaunay-Belleville

By

James L. Norris.

Att'y

# UNITED STATES PATENT OFFICE.

LOUIS MARIE GABRIEL DELAUNAY-BELLEVILLE, OF PARIS, FRANCE.

## GRATE FOR STEAM-BOILER FURNACES.

SPECIFICATION forming part of Letters Patent No. 549,446, dated November 5, 1895.

Application filed March 29, 1894. Serial No. 505,599. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS MARIE GABRIEL DELAUNAY-BELLEVILLE, a citizen of France, and a resident of Paris, in the Department of the Seine, France, have invented a new and useful Improvement in the Grates of Steam-Boiler Furnaces, of which the following is a specification.

This invention relates to grates for furnaces, the object being to provide simple means whereby the air for supporting combustion will be more evenly distributed below the grate-bars, and consequently the combustion of the fuel improved and the durability of the bars increased.

The invention consists in the construction, combination and relative arrangement of parts in grates adapted more especially for the furnaces of steam-boilers, as hereinafter described and claimed.

In the annexed drawings, illustrating the invention, Figure 1 is a sectional elevation on the line  $z' z'$  of Fig. 2, illustrating my improved grate for furnaces. Fig. 2 is a plan view of the same, omitting some of the fire-bars. Fig. 3 is a vertical section on the line T T of Fig. 2.

The transverse bearers A of the fire-bars B are perforated at  $a$ , Fig. 1, so that a circulation of the air flowing to the grate is facilitated and its access insured to that part of the grate situated immediately back of these bearers. The fire-bars B may also have perforations  $b$ , Fig. 1, if desired. The bearers A are supported at C on the walls of the ash-pit, and they may also have an additional or middle support C' if the width of the grate necessitates it.

The rocking plates D are provided with perforations  $d$ , Figs. 1 and 3, to afford passages through which air can circulate below the grate-bars, and the upper and lower edges of these plates D may be provided with recesses or notches  $d'$ , Figs. 2 and 3, for a similar purpose. By this construction the air has free access to every part of the grate.

The shaft E, by which the plates D and fire-bars B are rocked, is carried or supported by two brackets F, fixed to the walls of the ash-

pit. If the width of the furnace is great an additional or central support F' may be employed. It is preferable to construct the shaft E in the form of a tube of square section and to so place it that hot ashes and cinders falling through the grate cannot lodge thereon. The shaft E is preferably made hollow for lightness. For the purpose of carrying the plates D the shaft E is provided with arms G, preferably constructed of wrought-iron or cast steel and of small horizontal section, as shown in Fig. 5, but of sufficient depth to give the required strength, and they may be shrunk on or otherwise secured to the shaft. At its ends the shaft E is provided with cast-steel caps or boxes H, which oscillate in knife-edge bearings 2, Fig. 3. This shaft E may be made in two lengths joined together at the middle by a coupling L, Fig. 2, carrying a forked lever  $l$ , Figs. 1 and 3, that may connect by a suitable rod to another lever (not shown) placed externally to the furnace and serving as a handle for rocking the shaft E and connected parts, so as to carry the plates D into rocking contact with the fire-bars B for rocking the latter. When there is a central support F' provided, owing to the width of the furnace, the shaft-coupling L will be arranged to rest on a knife edged bearing 3, Fig. 3, fixed to said additional support. On the inner sides of the rocking plates D there are preferably provided lugs I, Fig. 2, that serve as counter-weights.

It will be observed that the arrangement of parts comprised in the grate is very simple and offers the minimum of obstruction to a free circulation of air, and consequently to its easy access to the whole lower surface of the grate, by which is gained a more complete combustion of the fuel and a greatly increased durability of the fire-bars and other parts of the grate.

What I claim as my invention is—

The combination with the fire-bars B and perforated bearers A, of the shaft E mounted intermediate the bearers and provided with arms G, the perforated and counter-weighted rocking plates D carried by said arms and



supported therein below the fire-bars, and  
lever mechanism connected with said shaft  
and adapted to impart a rocking movement  
thereto and through said arms and plates to  
5 the fire-bars, substantially as shown and de-  
scribed.

In testimony whereof I have signed this

specification in the presence of two subscrib-  
ing witnesses.

LOUIS MARIE GABRIEL DELAUNAY-BELLEVILLE.

Witnesses:

J. W. JOUY,

CLYDE SHROPSHIRE.