



# UNITED STATES PATENT OFFICE.

TOWNSEND POORE, OF SCRANTON, PENNSYLVANIA.

## BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 333,544, dated January 5, 1886.

Application filed May 25, 1885. Serial No. 166,560. (No model.)

*To all whom it may concern:*

Be it known that I, TOWNSEND POORE, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented a new and useful Improvement in Boiler-Furnaces and Grates therefor, of which the following is a specification.

In the accompanying drawings, Figure 1 is a vertical, longitudinal section of a boiler-furnace and the grate used therewith, representing my invention, and Fig. 2 is a vertical transverse section of the same.

My invention consists, first, in a boiler-furnace, the fire-box of which is provided with openings properly fitted with doors on its sides, and with an endless-chain grate arranged across the fire-box, and passed around drums, which may be outside the fire-box, and by one of which it is moved; second, in a certain combination of the fire box of the boiler-furnace, the endless-chain grate, and an ash-screen or platform; third, in a sectional grate arranged across the fire-box upon sectional drums, which are outside the fire-box, and can be operated either all together, separately, or in plurality, as will be hereinafter described.

A in the drawings may represent a boiler-furnace of a known construction, excepting that the draft-openings *a* and doors *b* are formed on the sides instead of in the front of the fire-box B thereof. The furnace shown has its boilers C provided with return-flues *c*, and its draft or smoke stack at the front, as shown.

Other constructions of furnace and boiler may be adopted, provided the draft-openings and doors are placed in the sides of the fire-box, as represented.

Across the fire-box an ash-platform or screen-plate, D, is constructed, being supported by girders properly applied to the walls of the fire-box, as shown in Fig. 2. Above this platform another series of T-shaped girders, *f*, are provided, also two L-shaped girders, *f'*, the same being properly supported by the walls of the fire-box. In supports *g g'* of the furnace-wall drums E F are hung on shafts *h h'*. One of these drums may be six or many sided, while the other is round, and each drum

may be in one body or made of separated sections *m m' m<sup>2</sup> m<sup>3</sup>*, and each section of the drum F may have a toothed wheel, G, fastened to one of its ends and revolve with the wheel on the shaft *h'*, and said toothed wheels may, respectively, be revolved by toothed pinions, as H, arranged to slide laterally on a plane-sided or other suitable shaft, *h<sup>2</sup>*, which is revolved by a hand-crank or other means. Around the drums E F, and upon the T and L shaped girders, endless sectional grates I I' I<sup>2</sup> I<sup>3</sup> are arranged, being separated by the vertical legs of the T-shaped girders *f*, as shown.

For a fuller description of this sectional grate and means for operating it, reference is made to my application No. 162,319, filed April 15, 1885, for a patent for a grate, as the special construction and mode of operating it form no part of my present claim.

From the drawings it will be seen that the endless grates extend entirely across the fire-box through the openings *a* and around the drums on the outside of the fire-box, and that the doors *b* close the spaces above the top of the grate, said doors being provided with peep-holes *n*, which are covered by smaller doors *n'*. If desired, the doors *b* may be hinged at their upper edges, and swing back and forth within their openings *a*, as the grate moves with its charge of fuel into the fire-box for supplying the fire, and out of the same with its ashes and débris for discharge thereof into suitable receivers.

Above the ash screen or platform D a number of doors, *s*, are provided in the walls of the fire-box, through which implements may be inserted for cleaning ashes and cinders from the platform. These doors may be used for regulating the draft when desired.

The platform serves for protecting workmen who may be repairing the sagging or under portion of the chain-grates while the fire is burning upon the upper portion of the same.

In supplying the fire-box with fuel, the culm or other fine hard fuel or bituminous coal is placed upon the grate directly above the drum F, and by revolving this drum the fuel is fed into the fire-box until it covers a surface extending from side wall to side wall,

and as fast as the fuel burns out a fresh supply is kept up by fuel upon the grate outside the fire-box, and revolving the drum F. As fresh fuel goes in at one side, ashes and cinders of consumed fuel pass out at the other side of the fire-box.

My improved construction of fire-box and endless-chain grate or grates greatly improves furnaces for burning culm or other fine hard fuel, and also for bituminous coal. The endless grate being applied across the fire-box and capable of traveling subjects the fuel all over the fire-bed to the full action of the draft, and it avoids the necessity of opening doors for checking the fires, or in order to "fire up," or remove the ashes, &c., and supply a fresh charge of fuel, as it admits of the supply being introduced without opening the doors, and as fast as fuel is burned off a fresh quantity being supplied; and simultaneously with the fresh supply, the opposite ends of the grates will be freed from ashes and cinders. Thus

a perfect fire can be kept up constantly with great economy in fuel, as no time is lost nor appreciable waste of fuel experienced.

What I claim is—

1. The combination of the fire-box of a boiler-furnace, provided with openings and doors on its sides, and an endless traveling-chain grate arranged across the fire-box upon drums, by one of which it is operated, substantially as and for the purpose described.

2. The combination of the fire-box having openings and doors in its sides, transverse endless traveling-chain grate, and the ash screen or platform, substantially as described.

3. An endless sectional traveling-chain grate arranged across a fire-box, having openings and doors in its sides, substantially as and for the purpose described.

TOWNSEND POORE.

Witnesses:

J. F. SNYDER,  
EDMUND BARTL.