

Steam-Boilers.

Patented July 7, 1874.



WITNESSES:
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UNITED STATES PATENT OFFICE.

PHILIP T. BROWNELL, OF ELMIRA, NEW YORK.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. 152,791, dated July 7, 1874; application filed January 5, 1874.

To all whom it may concern :

Be it known that I, PHILIP T. BROWNELL, of Elmira, in the county of Chemung and State of New York, have invented a new Improvement in Steam-Boilers, of which the following is a specification :

In the accompanying drawing, Figure 1 represents a vertical transverse section of my improved steam-boiler on the line *c c*, shown with the fire-box and grate drawn out; and Fig. 2 represents a vertical longitudinal section of the same on the line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of my invention is to construct a steam-boiler with increased heating-surface for less powerful engines, in which steam may be rapidly generated, directly transferred to the cylinders, and the action of the fire on the boiler instantly interrupted in case of danger, or for the purpose of stopping the engine.

The invention will first be fully described, and then pointed out in the claims.

In the drawing, A represents the horizontal steam-boiler, made of cast-iron or plates, the lower half of which is made thicker than the upper half, for the purpose of strengthening the same sufficiently to be perforated with a suitable number of holes, for connecting therewith the downward-extending vertical tubes B, which are closed at their lower ends. The boiler A is supported at both ends, and surrounded along its longer sides by a casing, C, which forms a chamber around the boiler for the escape of the smoke to the chimney, as shown in the drawing. In the lower part of casing C, below the boiler-tubes B, slides, on suitable guide-flanges, *a*, the movable fire-box and grate D, which is placed, for the purpose of withdrawing it rapidly from below the boiler, on legs with casters, *b*. As the tubes B extend down nearly to the top of the fire-box D, the fire acts on the bottom and sides of the same, passes then around the boiler, and generates thereby steam very rapidly. The smoke will pass out to the chimney, above the boiler, with nearly all its heat being utilized for developing steam. The fire-box D, when drawn out, allows thereby the instant interruption of the action of the

heat on the boiler, and is then covered by a lid, D', which is hinged to the outer side of casing C and carried down over the fire-box. By a weight and chain attached to lid D', the same may be thrown up against casing C, and retained in this position during the time the fire-box is pushed in for use. The front part of the fire-box is provided with a flange, *b*, which projects forward under right angles to the front, and serves to close the smoke-channel C', arranged along the inside of casing C by an interior plate or wall, E, which extends between boiler and casing from the fire-box to the chimney, as shown in Fig. 1.

When the fire-box is drawn out, the rear wall of the same comes in contact with the lower edge of the plate E, so that the smoke of the fire may pass out directly through the smoke-channel C' to the chimney without influencing tubes B or boiler A. The circular front head F of the boiler A is bolted in suitable manner to the same, and provided at its inner face with a steam drum and cylinders for a three-cylinder engine, into which the steam is directly introduced, as developed in the boiler, requiring no connecting-pipes, and economizing considerable space thereby. The whole boiler and engine may be built in very compact shape, easily started, and its operation quickly interrupted, being mainly adapted for engines of smaller size.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent—

1. A boiler having the flue C', leading to its smoke-discharge pipe, connected with a sliding fire-box, D, to take off the products of combustion when said fire-box is withdrawn.

2. A sliding fire-box provided with the lip *b*, arranged to close the flue C' when the fire-box has been pushed under the boiler.

3. A sliding fire-box, D, combined, as described, with a plate, D', hinged to the boiler-case, covering the top of fire-box when said box is drawn out, and swinging up out of the way at other times.

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Witnesses :

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