

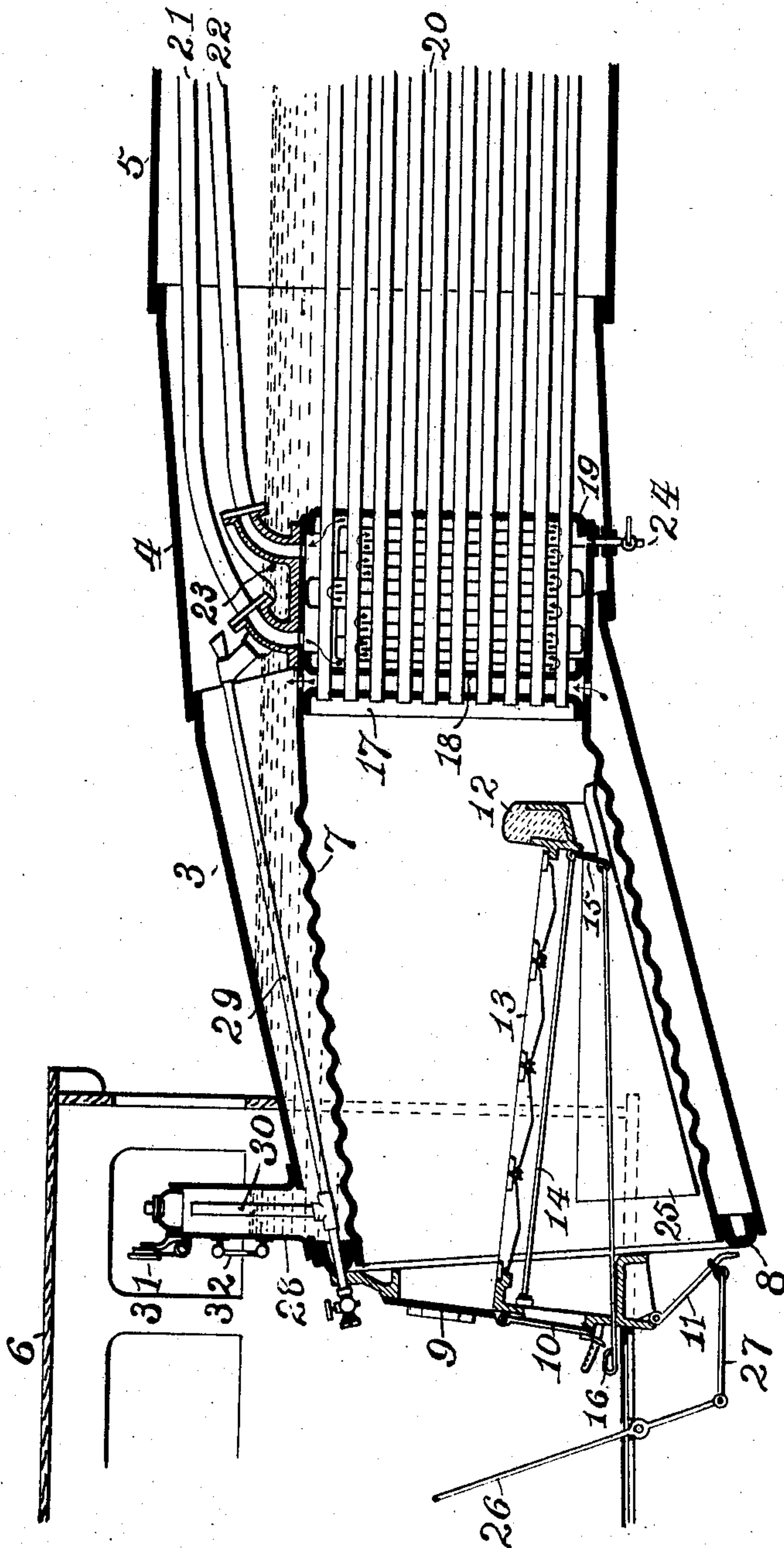
No. 859,561.

PATENTED JULY 9, 1907.

0. ILLI.

SUPERHEATER FOR STEAM BOILERS.

APPLICATION FILED NOV. 10, 1908.



Witnesses

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OSCAR ILLI, OF SCHENECTADY, NEW YORK.

SUPERHEATER FOR STEAM-BOILERS.

No. 859,561.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed November 10, 1906. Serial No. 342,829.

To all whom it may concern:

Be it known that I, OSCAR ILLI, a citizen of Switzerland, residing at Schenectady, in the county of Schenectady and State of New York, have invented certain new and useful Improvements in Superheaters for Steam-Boilers, of which the following is a specification.

This invention relates to improvements in superheaters and to superheaters particularly designed for internally-fired steam boilers.

The main object of the invention is to construct a superheater in connection with the fire-box and in a manner such as to increase the efficiency of the superheater.

With these objects in view, the invention consists in the structure and in the combination of parts constituting the same substantially as herein described and claimed.

The accompanying drawing shows, in vertical, longitudinal section, so much of a locomotive boiler as is necessary to illustrate my improvements and their application.

Three sections of the boiler shell are presented at 3, 4 and 5, while the forward portion of the cab is indicated at 6. The fire-box, preferably corrugated, is represented at 7, and is attached by the narrow ring, 8, U-shaped in cross-section, to the rear end of section 3, and to said ring is connected the face-plate with its fire-door, 9, draft-flap, 10, and ash-door, 11. Extending from the face-plate to the bridge, 12, is the grate, 13, said bridge being stayed to the face-plate as indicated at 14. The bridge consists, preferably, of a casting, U-shaped in cross-section, in the channel of which and above the edges whereof, is formed or placed a ridge of fire-brick. Below the bridge is an opening into the ash-space controlled by door, 15, having an operating rod, 16, which extends out through the face-plate within reach of the stoker. As a floor to the ash space, a smooth plate 25 is provided and the ash door is operated through lever 26 connected thereto by link 27.

Into the forward end of the fire-box is built the superheater. For this purpose the flue-sheet, 17, is placed at some distance within the forward end of the fire-box shell. The rear end of the superheater is located a short distance in front of the flue-sheet, as seen at 18, thus providing a water space between them which communicates, through perforations as indicated, with the water space around the fire-box. By this means the flue-sheet is kept from burning out and the circulation of the water in the boiler is facilitated. In the forward end of the fire-box shell, the other head, 19, of the superheater is placed and through these heads and the space between extend the fire-tubes, 20, from the flue-sheet forward to the smoke-box, the latter not

being needed for disclosure of the invention is not shown.

Into the superheater, the steam from the steam space is led by the pipe 21 and from it to the steam-chests (not shown), by the pipe 22. These pipes are preferably connected to the superheater by means of a casting, 23, to nipples, in which, they are secured, said nipples registering with perforations in the wall of the superheater as indicated.

To provide for intimate, extended and close contact of the steam with the fire-tubes, vertically disposed baffle-plates are located between the heads of the superheater and parallel therewith. They may be of any desired form and arrangement, by preference, however, two of the vertical plates at the middle of the superheater extend to the top thereof and have horizontal plates extending therefrom to the front thereof and to the rear thereof to within short distances of the heads of the superheater. To the outer ends of these horizontal plates the first and last of the vertical plates are connected. By this arrangement of the horizontal plates, an entrance chamber for the pipe 21 and an exit chamber for pipe 22, are formed. The intermediate baffle plates alternately abut and fall short of the bottom of the superheater and said horizontal plates, thereby forming a sinuous path, down and up, across the fire-tubes from the entrance at pipe 21 to the exit at pipe 22. The steam in traversing this path is heated to a very high degree, because brought into contact with the hottest part of the bank of fire-tubes.

A suitable blow-off for the superheater may be provided, preferably in the last compartment thereof, as indicated at 24.

The invention claimed is:—

1. In a steam boiler, the combination with the fire-box shell extended beyond the flue-sheet, of a superheater in said extension and traversed by the fire-tubes.

2. In a steam boiler, the combination with the fire-box shell extended beyond the flue-sheet and having perforations near the flue-sheet, of a superheater in said extension and traversed by the fire tubes, and a water chamber in said extension at the rear of the superheater for communicating with the boiler through said perforations.

3. In a steam boiler, the combination with the fire-box shell extended beyond the flue-sheet, of a superheater in said extension and traversed by the fire tubes, the interior of the superheater being provided with vertically disposed baffle-plates.

4. In a steam boiler, the combination with the fire-box shell, of a flue-sheet located within its forward end thereby leaving an extension of the shell beyond the flue-sheet and through which fire-tubes extend forward, the rear head of a superheater located in said extension a little forward of the flue-sheet and providing a water space between it and the flue-sheet, the other head of the superheater located at the forward edge of said extension, and means for conducting steam to and from the interior of the superheater so formed.

5. In a superheater traversed by fire-tubes, vertical plates at the middle thereof extending to its top, horizontal plates joined to said vertical plates and to other vertical plates near the heads of the superheater, and intermediate vertical plates alternately abutting and falling short of said horizontal plates and of the bottom of the superheater.
6. In an internally fired locomotive boiler, the combination with the fire-box shell extended beyond the flue-sheet, of a superheater built in said extension about the fire-tubes, a casting secured to the top of the fire-box shell above the inlet and outlet chambers of the superheater and provided with nipples communicating with said chambers constituting the inlet and outlet of the superheater, and pipes attached to these nipples and lying in the steam space of the boiler.
- In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.
- OSCAR ILLI.

Witnesses:

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