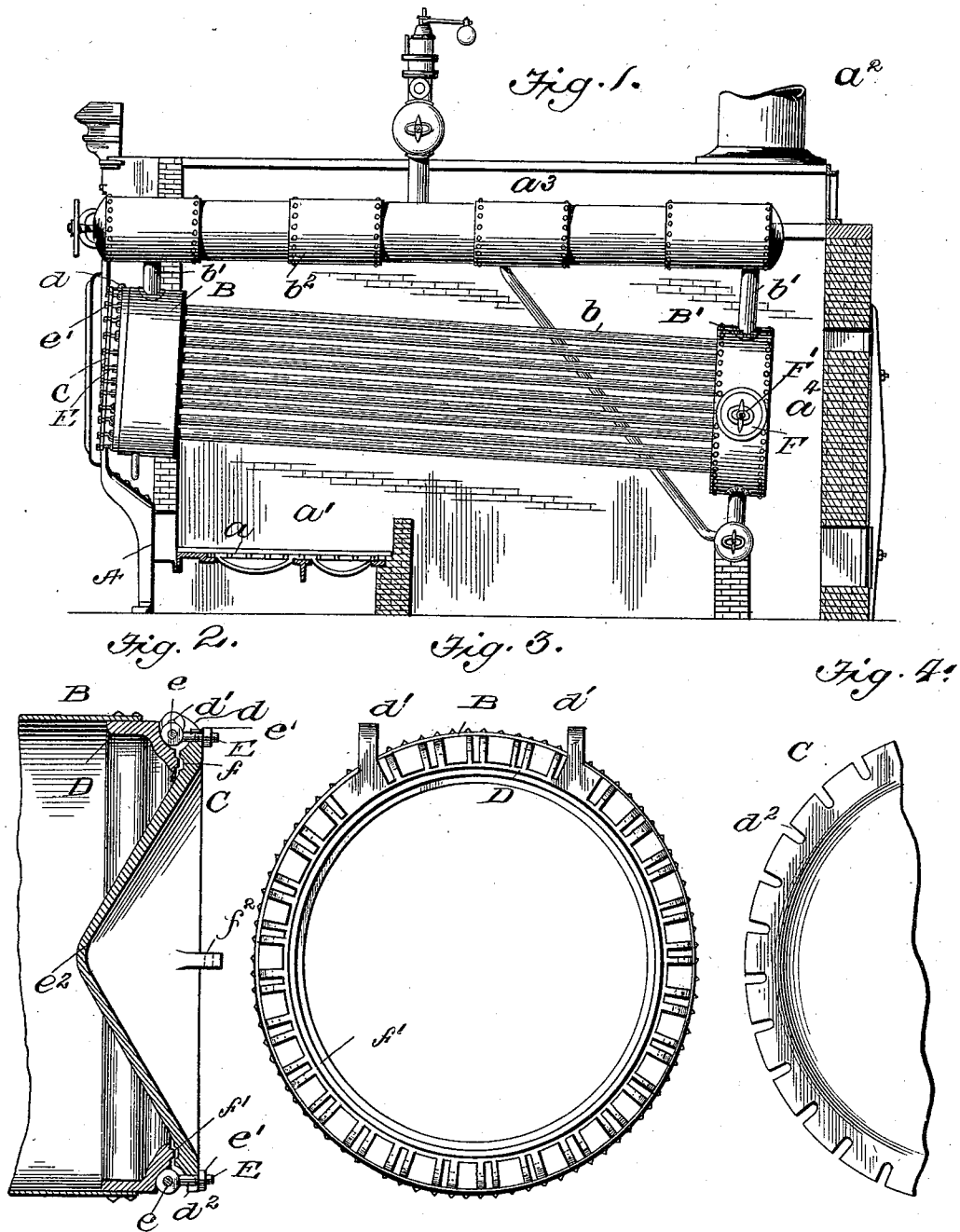


(No Model.)

T. GUNNING.
STEAM BOILER.

No. 544,618.

Patented Aug. 13, 1895.



Witnesses

John D. Smith
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Inventor

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By [Signature]

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UNITED STATES PATENT OFFICE.

THOMAS GUNNING, OF PITTSBURG, PENNSYLVANIA.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 544,618, dated August 13, 1895.

Application filed December 14, 1894. Serial No. 531,746. (No model.)

To all whom it may concern:

Be it known that I, THOMAS GUNNING, of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention contemplates certain new and useful improvements in steam-boilers, having reference to the class of water-tube boilers.

The object of the invention is to provide a boiler in which access can be readily and easily had to the end headers for the purpose of cleansing or repairing, and in which plug-covered openings or hand-holes are dispensed with. This I accomplish by providing the forward end header into which all the water-tubes open with an outer removable head-plate. This head-plate is hinged or pivoted at its top and is provided with peripheral slots wherein are designed to fit a corresponding number of nutted bolts, said bolts being pivoted to the shell of the end header. The rear end header is located entirely within the inclosing casing of the boiler, and access may be had thereto through a manhole in one side extending through the side of the casing.

The invention comprises the novel features of construction and also the detail combination and arrangement of parts, substantially as hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view of a boiler provided with my improvements, parts being broken away. Fig. 2 is an enlarged vertical sectional view of a portion of the forward end header. Fig. 3 is a front view of the end casing. Fig. 4 shows a part of the header-plate.

Referring to the drawings, A designates the inclosing-casing; a , the grate; a' , the fire-box; a^2 , the smokestack; a^3 , an upper super-heating flue or chamber, into the rear of which opens a perpendicular draft-flue a^4 .

B B' designate, respectively, the forward and rearward end headers, which are con-

nected together by water-tubes b , and are united by legs b' to upper steam-chambers b^2 , which extend up into flue a^3 . These features are fully described in my allowed application for patent filed October 3, 1894, Serial No. 524,774, and further reference thereto is not necessary. The forward end header B is of cylindrical form, and to its inner or rear plate are connected the water-tubes b . The outer plate C is bodily removable—that is, it is capable of being swung up out of the way—thus allowing free access to the interior of the header, whereby the tubes as well as said header may be readily cleansed or repaired, an uninterrupted entrance to the header being thus obtained. This plate is of circular form, and at its upper end has two ears or lugs d , designed to be pivoted each to perforated ears d' , projecting from a supplementary end lining D, riveted or otherwise rigidly secured to the header-shell. In the periphery of this head-plate, at short distances apart, are slots d^2 open at their outer ends, and in which are designed to fit bolts E, pivoted at their inner ends e to the end lining D. These bolts are threaded and have nuts e' working thereon, so that when said bolts are inserted into their respective slots in the periphery of the head-plate the latter can be firmly secured by tightening the nuts on said bolts up against said plate. The head-plate is shown as being extended inwardly in conical form at e^2 , and on its inner surface, near its edge, is a continuous groove or recess f , which may be lined with lead, and into which is designed to fit a corresponding flange f' , on the forward end of the end lining D. In this way when the head-plate is closed down a firm joint is had, the series of bolts being inserted into their respective slots and the nuts thereon tightened, binding said plate firm against the projecting portion of the end lining, the fit between the latter and said plate serving to prevent any escape of steam or water. When it is desired to gain access to the end header the operator merely loosens the nuts on the series of bolts and turns the latter on their pivots away from contact with the header-plate, permitting the latter to be swung upon its hinges or pivots. An apertured arm f^2 projecting from plate C near one

side thereof enables an operator to readily effect the raising of said plate by the insertion of a suitable tool in the aperture.

The rear end header B' is located entirely within the casing A, and between its rear face and the rear wall of said casing is the draft-flue *a*⁴. A manhole F is on one side of this rear end header B' and extends through the side wall of the casing. It is normally closed by any ordinary plate and binding-cap F'.

From what has been said it will be seen that I have dispensed with all hand-holes or openings for gaining access to the water-tubes for the purpose of cleansing and repairing the latter, and that by making the head-plate of the forward header removable said header, as well as the water-tubes, can be readily and quickly repaired or cleansed. It will also be noticed that the locking or binding of the head-plate of the forward header in position can be quickly accomplished, it only being necessary to tighten the nuts on the series of bolts after the latter are positioned in the respective slots in the periphery of said head-plate. These bolts being pivoted to the casing can be quickly and easily thrown out of or in position, being always on a line to correspond with the slots in the head-plate. By locating the rear end header entirely within the boiler better results are secured, since the header is subjected at every point to the action of the products of combustion in their travel down to and up through the rear draft-flue, and this header being of cylindrical form and free of all hand-holes and the like a large surface is presented for the action of the heat or products of combustion, which contact with said header at nearly every point.

It will be understood that if desired one or more supplemental headers may be located intermediate of the end headers, all being connected by the water-tubes.

I claim as my invention—

1. In a water-tube boiler, the shell having an end-header provided with an inwardly projecting portion, the series of water tubes opening into the inner end of said header, the

plate corresponding to the outer end of said header and designed to fit against said inwardly projecting portion and provided with peripheral slots, and the series of nutted bolts corresponding to said slots, whereby said plate can be securely locked to said end-header and held against said inwardly projecting portion, substantially as set forth.

2. In a water-tube boiler, the shell having an end-header, the series of water-tubes opening into the inner end of said header, the end lining secured to the shell of said header, the plate pivoted to said end-lining and having a series of peripheral slots, and the series of nutted bolts also pivoted to said end-lining and designed to enter said slots, substantially as set forth.

3. In a boiler of the class herein-described, an end-header having an inwardly projecting flange, a removable head-plate having an inner groove designed to receive a corresponding portion of said flange, and a series of pivoted nutted bolts for binding said head-plate to said end-header, substantially as set forth.

4. In a boiler of the class herein-described, an end-header having an inner end-lining provided with an inwardly projecting portion, a pivoted head-plate having a series of slots in its periphery, and a series of bolts pivoted to said end-lining and having nuts thereon, substantially as and for the purpose set forth.

5. The combination with the boiler having a forward end header, of a head-plate pivoted to said header and having an arm extending therefrom, and a series of pivoted nutted bolts engaging said head-plate for securing the latter to said header, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

THOMAS GUNNING.

Witnesses:

CHAS. F. RANKIN,
CHARLES H. RHODES.