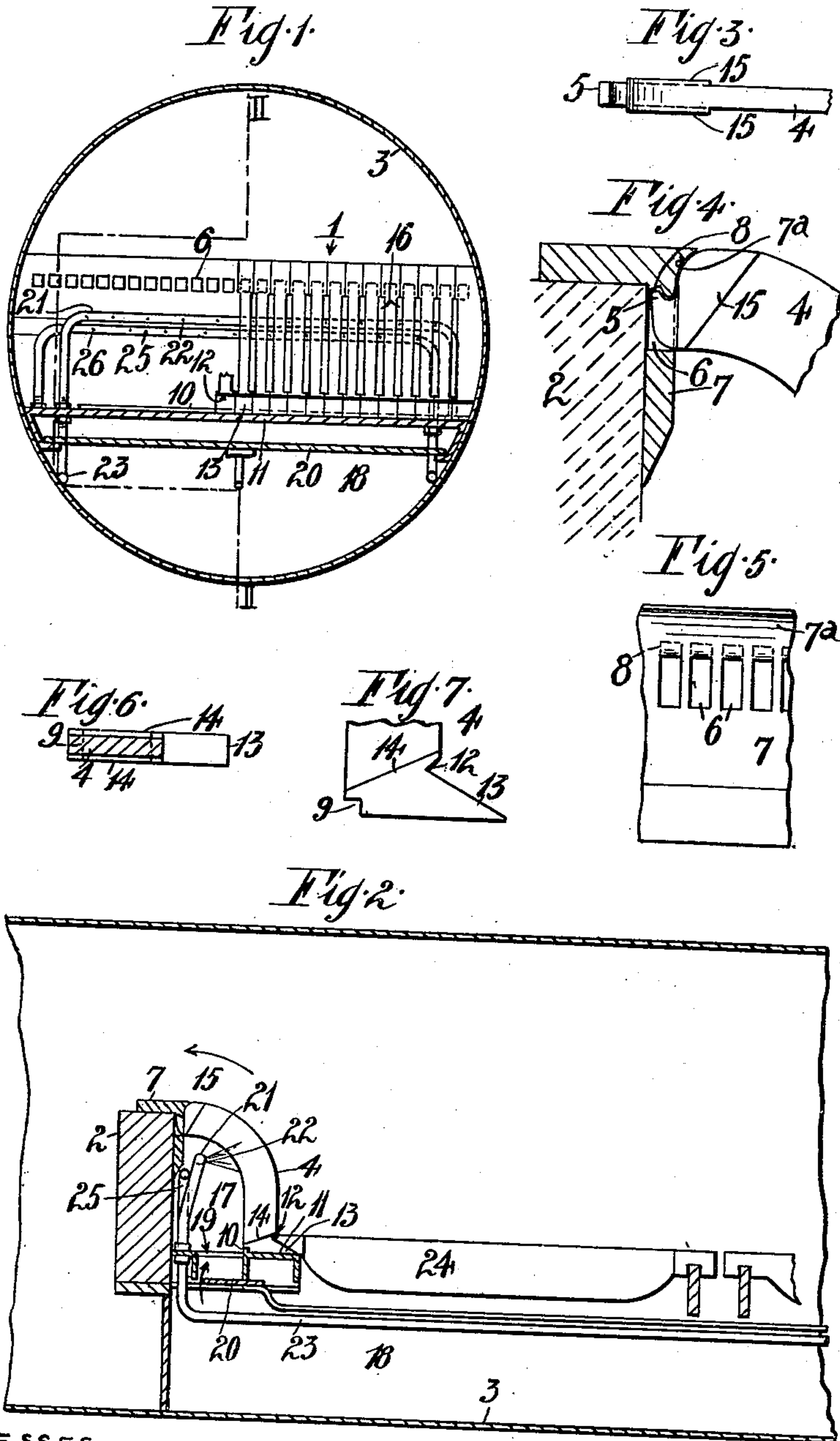


J. POMEROY.  
STEAM BOILER FURNACE.  
APPLICATION FILED AUG. 10, 1909.

991,885.

Patented May 9, 1911.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

JOHN POMEROY, OF WEST MELBOURNE, VICTORIA, AUSTRALIA.

## STEAM-BOILER FURNACE.

991,885.

Specification of Letters Patent.

Patented May 9, 1911.

Application filed August 10, 1909. Serial No. 512,177.

*To all whom it may concern:*

Be it known that I, JOHN POMEROY, a subject of the King of Great Britain, residing at Capel Street, West Melbourne, in the State of Victoria, Commonwealth of Australia, inventor, have invented Improvements in Steam-Boiler Furnaces, of which the following is a specification.

The objects of this invention are to effect a saving of fuel, insure complete combustion and minimize the smoke. These objects are accomplished by forming at the back of the furnace an air chamber, which communicates with the ash pit, and is formed by a series of curved spaced bars which constitute a hollow fire bridge located between the inner ends of the ordinary fire bars and the furnace bridge. Heated air and steam are introduced into said chamber and delivered through the hollow bridge into the flames of the furnace for the purpose of effecting complete combustion and keeping the interstices of the fire bridge clear. The bars of the hollow bridge are independently secured in position so that when any particular one is burned or worn it is unnecessary to do more than replace such damaged one.

The invention is illustrated by the accompanying drawings whereof;

Figure 1 is a vertical transverse section (broken) through the furnace tube of one type of boiler showing the invention applied thereto. Fig. 2 is a longitudinal section (broken) on line  $\square-\square$ , Fig. 1. Figs. 3, 4, 5, 6 and 7 are enlarged details (broken) of parts of the invention.

According to this invention an arched hollow metallic fire bridge 1 is formed against the bridge 2 in the furnace tube 3 of the boiler. Said metallic fire bridge consists of a number of independent removable metallic bars 4, each curved rearwardly at the upper end and provided with a locking bead 5, Fig. 4, which fits into a hole 6 formed in a cap plate 7 and is adapted to interlock with a recess 8 formed in the back top edge of said hole 6. Said cap plate 7 is preferably of angular shape and is adapted to be seated upon or secured to the furnace bridge 2, and it is formed with a curve 7<sup>a</sup> about its front top edge. The rear lower end of said bar is formed with a rabbet 9, Fig. 7, which engages with a correspondingly shaped upwardly extending bar 10 formed on a transverse ribbed plate constituting the base 11 of the metallic fire bridge.

The lower end of said bar rests on the base and has an angular nick 12 in its front edge below which is an inclined forward projecting foot 13, while both ends of said bars are formed on each side with contact nibs 14, 15, to space the bars and form regular interstices 16 for the purpose of admitting the steam or heated air or both. The space behind said bridge constitutes an air chamber 17 which communicates with the ash pit 18 through the medium of an opening 19 in the base 11, which is controlled by a damper 20. Within said chamber is a pipe 21 secured to the base and provided along its horizontal portion with a series of jets 22 and steam is communicated to said pipe by another pipe 23 detachably connected thereto and leading through the ash pit to the source of steam supply.

In setting up the fire bridge, the upper end of each bar is first inserted in a hole 6 in the cap plate 7 and interlocked therewith and its lower end is then dropped on the base so that the horizontal bar 10 fits into the rabbet 9 after which an ordinary fire bar 24 of the furnace is placed in position so that it rests upon the inclined foot 13 while its end engages with the nick 12 thereby locking the whole of the metallic bridge firmly in position. It will thus be evident that when all the bars 4 are placed side by side in position that the whole, by reason of the contact nibs 14, 15, constitutes a hollow fire bridge with interstices 16 in its front, while any individual bar may be removed and replaced by simply raising the corresponding or ordinary furnace bar 24 off the inclined foot 13 of said bridge bar. In cases where a supply of heated air is available it may be conducted by a pipe 25 through the ash pit 18 and be delivered by means of jets 26 or otherwise into the air chamber 17 thereby supplying hotter air than can be obtained by that passing through the ash pit. The steam which is sprayed through the hollow fire bridge combines with the gases of the furnace and produces a more complete combustion and this is assisted by the heated air introduced through the ash pit into said chamber and which is delivered through said fire bridge also into the flames of the furnace.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is;

1. In a steam boiler furnace, the combina-



tion with the grate bars and the fire bridge, of a plurality of bars interlocking at their upper end with the top of the fire bridge, and a support for their lower ends, each of  
 5 said bars, at their lower ends having a projecting portion on which rests the end of a grate bar.

2. In steam boiler furnaces, the combination with the grate bars and fire bridge, of  
 10 a cap plate on said fire bridge, a base having an upwardly extending projection thereon, said cap plate having a plurality of holes therein and a recess in the back top edge of each of said holes, a metallic bridge support-  
 15 ed upon the base and formed of a number of independent bars curved rearwardly at the upper end and provided on their sides at each end with contact spacing nibs, the upper  
 20 end of each bar having a locking bead adapted to enter one of the holes in the cap plate and engage with said recess formed in the back top edge of said hole, while the lower  
 25 end of each bar has a rabbet adapted to engage the upwardly extending projection on said base, and an angular nick in its lower front edge below which is an inclined forwardly projecting foot, upon which rests the grate bar for the purpose described.

3. In steam boiler furnaces, the combina-

tion with the fire bars and fire bridge, of a  
 30 base, a bar extending upwardly therefrom, a metallic bridge supported upon the base and formed of a number of independent bars curved rearwardly at the upper end and provided on their sides at each end with contact  
 35 spacing nibs, a metallic cap plate on the fire bridge formed with a curved front top edge and with a series of holes having recesses in the back top edges thereof, a locking bead on the upper end of each bar of the metallic  
 40 bridge adapted to enter the corresponding hole in said plate and engage the recess thereof, each bar having a rabbet in the rear lower edge thereof adapted to engage said bar on the base, and an angular nick in the front  
 45 edge of each bar, an inclined forwardly projecting foot below such nick upon which a corresponding fire bar rests, a damper for controlling the air delivery into the air chamber between said fire bridges, and a steam  
 50 pipe provided with jets in said chamber.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN POMEROY.

Witnesses:

EDWARD WATERS,

EDWARD A. WATERS.