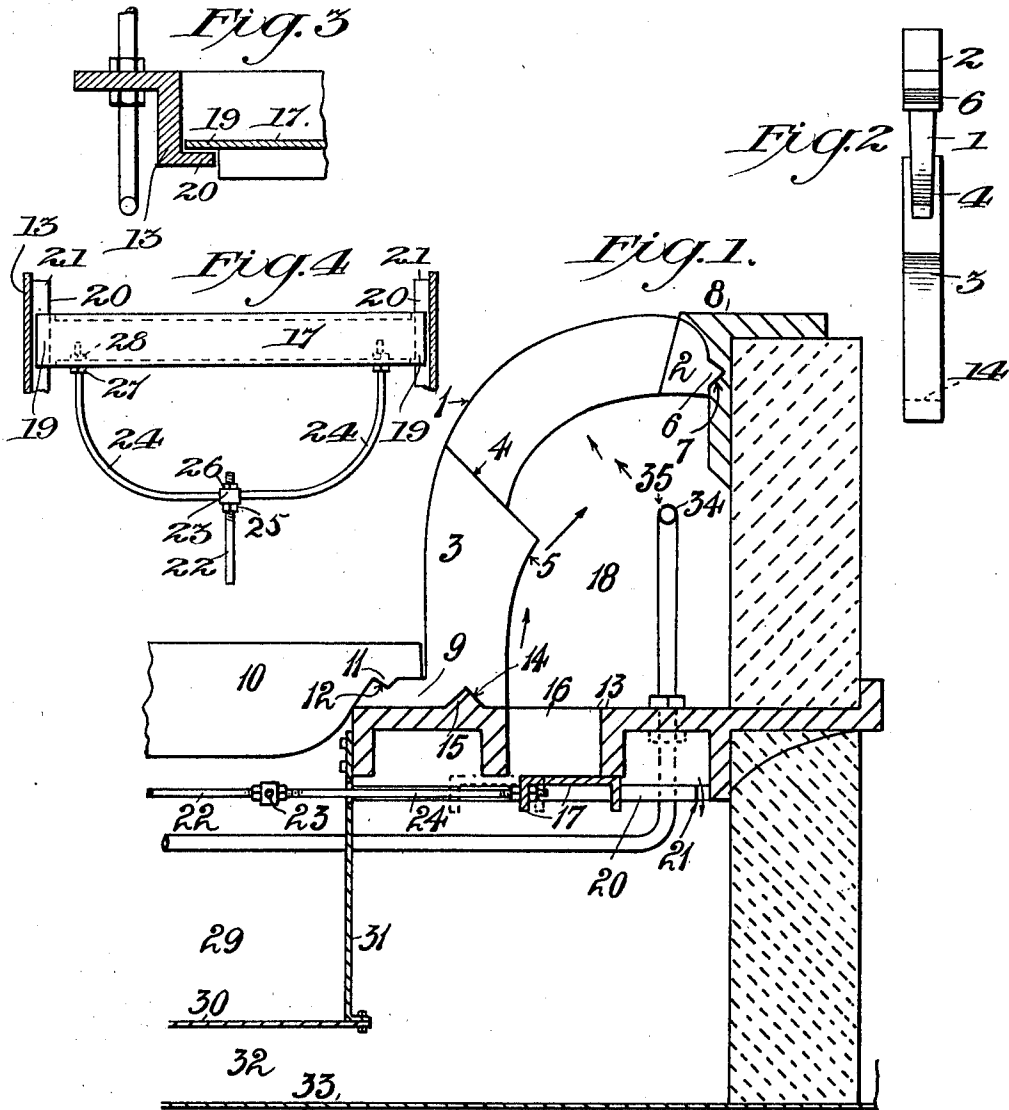


J. B. & J. POMEROY.  
FURNACE.  
APPLICATION FILED JULY 7, 1910.

1,004,073.

Patented Sept. 26, 1911.



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## FURNACE.

1,004,073.

Specification of Letters Patent. Patented Sept. 26, 1911.

Application filed July 7, 1910. Serial No. 570,776.

*To all whom it may concern:*

Be it known that we, JAMES BROKENSHA POMEROY, mechanic, and JOHN POMEROY, inventor, subjects of the King of Great Britain, residing at "Awarua," Alma Road, East St. Kilda, in the State of Victoria, Commonwealth of Australia, have invented an Improvement in Furnaces, of which the following is a specification.

10 This invention relates to furnaces having air bridges, and consists of improvements whereby a greater efficiency is attained.

The drawings illustrating the invention comprise: Figure 1 a longitudinal vertical section through an air bridge and part of a furnace. Fig. 2 a rear elevation of one of the bars of the bridge. Fig. 3 is a sectional detail showing a portion of the two way damper, and Fig. 4 is a plan (broken) of the damper drawn to a reduced scale and showing means for adjusting the same.

20 The air bridge is composed of a series of independently mounted bars 1 having upper and lower spacing nibs 2, 3. The lower ones extend up about half way where they terminate at their upper ends with preferably rearwardly inclined shoulders 4 to prevent falling clinkers lodging and are formed at or about their rear with a curve or deflector 5. These deflectors are adapted to prevent the air directly entering through the spaces between the bars into the furnace and to deflect the air toward the jets of steam so that a thorough mixing of the steam and air is effected and a more combustible gas is formed. It will be readily understood that such deflectors are equally applicable to air bridges formed in a single casting or in sections as well as to the illustrated independently mounted bars; in the former cases the deflector would be extended across the whole or a series of the bars. The upper ends of the bars have projecting lugs 6 preferably V-shaped or beveled on top and bottom and adapted to engage a correspondingly shaped longitudinal recess 7 extending practically the full length of the cap plate 8. By this construction there is no difficulty in assembling and fitting the bars to the cap plate, which advantage is not attained where separate recesses are provided for each bar, as air bridge bars through the accretion of clinkers become sometimes thickened and in consequence the locking means will not corre-

spond with the individual recesses. The lower end of each bar has a foot 9 upon which the furnace bars 10 rest, and the latter may be provided with preferably double beveled or V-shaped lugs 11 adapted to engage with correspondingly shaped notches 12 formed in the feet of the bridge bars. The transverse base plate 13 supports the bridge bars and in order to prevent the latter moving forwardly or rearwardly they are provided with preferably V-shaped notches 14, which fit over one or more correspondingly shaped bars 15 on said base plate. The latter has an air inlet opening 16 extending practically from one side to the other and across the bottom of same an adjustable two way damper 17 is adapted to be moved for the purpose of admitting air either into the front or rear of the air chamber 18 of the bridge.

75 The side edges 19 of the damper rest on slides or guides 20 formed on the sides of the base plate (Fig. 3) and the rear or inner ends of the slides or guides are cut away as at 21 so that clinkers dropping upon same will be pushed off the ends by the damper and so obstruction to the movement of the latter will be prevented. The damper is provided with an adjustable handle (Fig. 4) constituted by a straight rod 22 passed through a boss 23 on a yoke 24 and adjustably secured by set nuts 25, 26, while the ends of said yoke are adjustably connected to the front plate of the damper by set nuts 27, 28. By this means the damper may be attached to its handle rod 22 so that it will slide truly along its slides or guides 20.

95 Air is supplied to the bridge independent of that which feeds the furnace direct. To this end the ash pit 29 is divided horizontally by a plate 30, which is connected by an end plate 31 to the lower front edge of the base plate. By this means the consumption of air necessary for the furnace is avoided and means are provided through the passage 32 between the plate 30 and boiler tube 33 for supplying sufficient air to the bridge. The steam pipe 34 which passes along the air chamber is formed with holes 35, which must not be more than 1/32nd part of an inch in diameter. The object of such very small holes, which cannot be proportionately shown in annexed illustrations owing to the diminutive scale to which they

are drawn, is to cause friction of the stream when passing through the sides of the holes and so atomize same and cause the atoms of oxygen and hydrogen to be liberated and mix readily with the deflected air and with the gases of the furnace.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In furnaces, an air bridge comprising a plurality of bars, each of said bars being provided with upper and lower laterally extending spacing nibs whereby, when the bars are assembled, air passages will be formed between adjacent bars, the upper surface of each of said lower nibs being inclined rearwardly and downwardly and extending beyond the rear wall of its associated bar to form a deflector.

2. In furnaces, a base plate, an air bridge comprising a plurality of bars, each of which is provided at its lower end with a forwardly extending foot portion supported by said base plate and having a V-shaped recess in its upper surface and grate bars adapted to rest upon said foot portions, each of said grate bars being provided with a V-shaped lug on its under surface adapted to fit into said recesses.

3. In furnaces, an air bridge, having an air chamber, a base plate upon which said

bridge is supported, formed with an air opening and a two way damper slidably mounted beneath said opening adapted to admit air into the front or rear of said opening.

4. In furnaces, an air bridge, having an air chamber, a base plate upon which said bridge is supported, formed with an air opening, a guide on each side of said base plate having a portion cut away at its rear end, a two way damper adapted to slide on said guides, and a yoke shaped handle adapted to be adjustably secured to said damper by means of lock nuts.

5. In furnaces having air bridges, an ash pit divided by metal plates for the purpose of delivering air to the air bridge, independent of that which feeds the furnace, in combination with a base plate, upon which the bridge is supported formed with an air opening and a two way damper slidably mounted beneath said opening and adapted to admit air into the front or rear of said opening.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JAMES BROKENSHA POMEROY.  
JOHN POMEROY.

Witnesses:

EDWARD WATERS,  
EDWARD U. WATERS.