

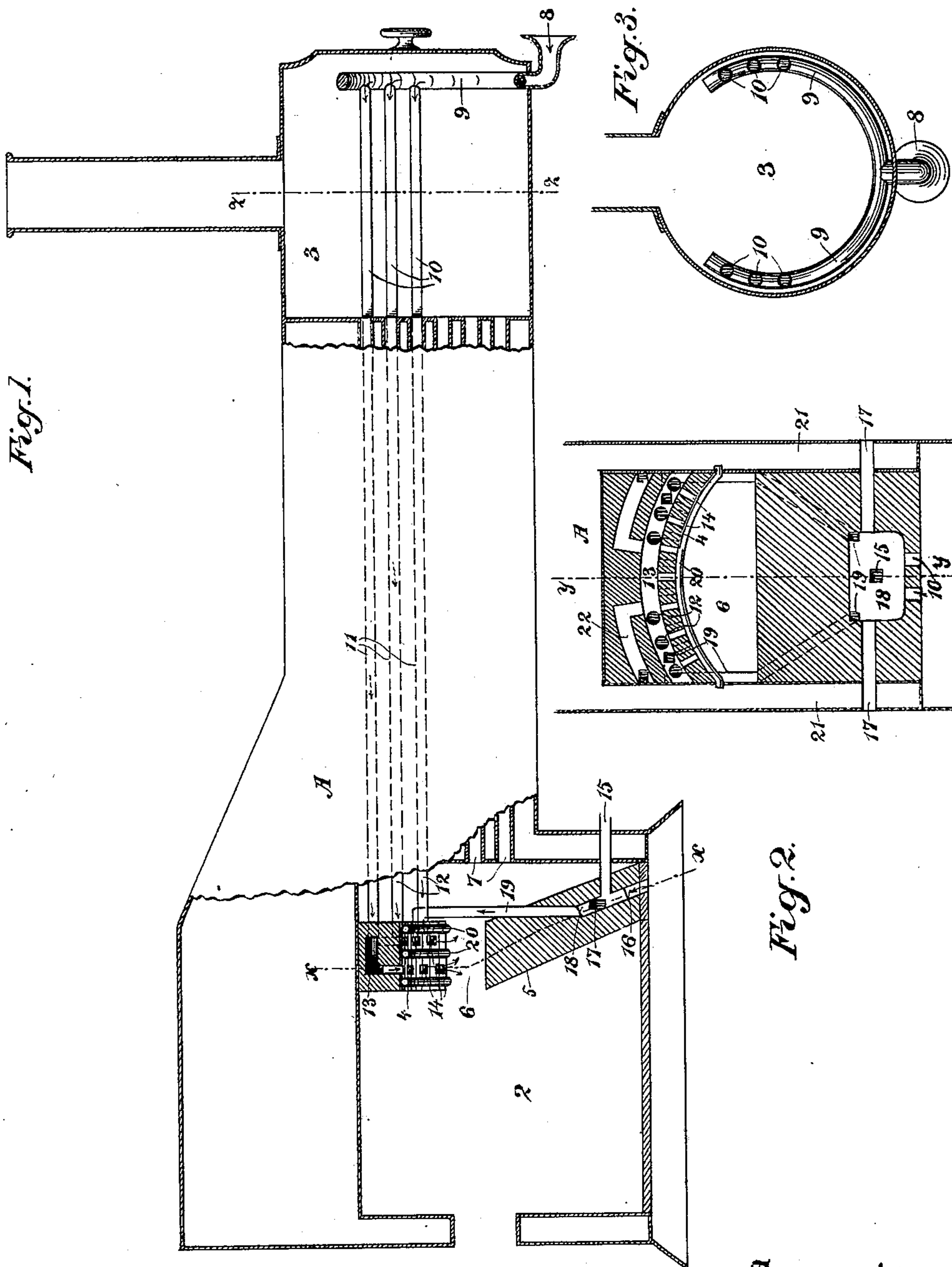
No. 652,895.

Patented July 3, 1900.

J. H. HOBART.
FUEL ECONOMIZER.

(Application filed Jan. 29, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

JOHN H. HOBART, OF EL PASO, TEXAS, ASSIGNOR OF ONE-HALF TO EDWIN R. PHILLIPS, OF SAME PLACE.

FUEL-ECONOMIZER.

SPECIFICATION forming part of Letters Patent No. 652,895, dated July 3, 1900.

Application filed January 29, 1900. Serial No. 3,168. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. HOBART, a citizen of the United States, residing at El Paso, county of El Paso, State of Texas, have invented an Improvement in Fuel-Economizers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to devices which are especially adapted for economizing in the combustion of fuel, and especially where used in conjunction with steam-boilers of any description.

It consists of the parts and the constructions and combinations of parts hereinafter described and claimed.

Figure 1 is a partial sectional elevation showing the application of my device to a locomotive-boiler on line *y y* of Fig. 2. Fig. 2 is a transverse section showing the hollow arch and the arrangement of the air supply and inlet passages on line *x x* of Fig. 1. Fig. 3 is a transverse section showing the arrangement of the inlet air-pipes and connected conductors on line *z z* of Fig. 1.

A is a boiler, which may be either of the locomotive type or it may be a stationary boiler set in masonry, having a fire-box 2 and the forward combustion-chamber or smoke-arch 3. Within the fire-box are the upper and lower arches 4 and 5, fixed with relation to each other, as shown, and having an arched passage 6 between them, through which the products of combustion pass from the fire-box through the tubes of the boiler, as illustrated at 7.

In my invention I supply heated air under a certain pressure or blast, which in a locomotive may be derived from the movement of the machine through the air, or it may be otherwise supplied either for the locomotive or stationary type of boiler.

In Fig. 1 I have shown a bell-mouthed pipe 8, opening toward the front and having branches 9 curved and following the interior form of the smoke-arch 3, as shown in transverse section. From these conductors pipes 10 extend backwardly upon each side and connect with pipes or passages 11, which convey the air back along each side of the boiler and through the pipes or passages 12. This air is

delivered into the upper passage 13 and the upper arch 4. The bottom of this arch is perforated with holes, as shown at 14, and through these holes the air is delivered downwardly into the passage or opening 6, through which the products of combustion pass from the fire-box, and the highly-heated air is thus delivered and intimately mingled with the passing products of combustion, thus furnishing air for the complete combustion of these products. The arch serves to convey the air to the center, where it passes through the openings and is distributed the full width of the boiler, but is more particularly thrown into contact with the lighter gases, which seek the top of the arch as they pass, thus insuring a supply of air which will cause their perfect combustion. It will be manifest that the air may be introduced from various points.

In the drawings, as here shown, I have illustrated a means for introducing the air from the front of the fire-box, as shown at 15, and a passage 16 by which it may be introduced from the ash-pan and carried up to the arch 4, and at 17 I have shown passages by which the air may be introduced from the sides of the fire-box. As shown in transverse section, the air introduced by any of these last-named methods passes into an enlarged chamber 18, from which it is carried by pipes or passages 19 and delivered into the chamber 13 of the arch 4, from which it passes, as before described, to the fire-box.

20 are water-pipes curved to support the upper arch, there being as many of these pipes following the curvature of the arch as may be desired, and these pipes connect directly with the spaces in the water-legs 21 of the fire-box, so that there will be a constant and free circulation of water through the pipes.

As applied to the stationary boiler the arrangement of passages for the inlet of air may follow those previously described or be otherwise varied. The passages may return upon themselves in the space behind the bridge-wall or lower arch, passing through the masonry in which the boiler is set or through equivalent pipes or passages, and the heated air in this case, as in the other, is

delivered into the chamber 22, which carries it toward the center and from which it passes downwardly into a second hollow arch 13, which in this case is interposed between the upper hollow arch and the passage 6, through which the products of combustion pass over the bridge-wall. The air is thus heated in the second arch and then is distributed out to the full width and delivered through openings 14, as previously described, into the space 6, through which the products of combustion are passing from the grate-bars to the combustion-chamber beyond the bridge-wall. By this construction and by disposing the supply-passages within the combustion-chamber behind the bridge-wall I protect them from danger of being broken into or injured by the use of the implements for stirring the fire, which is a danger that would be liable to occur if the passages were made within the sides of the fire-box.

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

1. The combination of a boiler and the fire-box thereof, an arch fitted in the upper part of the fire-box and having an internal chamber, a wall built up from the lower part of the fire-box and forming a heat-passage between itself and the arch above, passages made in said wall and connections therewith from the fire-box, means connecting said passages with the chamber of the arch and means

connecting the said chamber with the heat-passage between the arch and wall.

2. The boiler and fire-box thereof, an arch fitted in the upper part of the fire-box, supporting-tubes extending beneath the arch and connecting with the water-legs of the fire-box upon either side, a wall built up from the lower part of the fire-box forming the heat-passage between itself and the arch above, passages made in said wall and connections therewith from the front of the fire-box, a chamber or chambers formed in the arch above, with which the passages in the lower wall are connected, and openings in the bottom of said arch whereby the air is delivered into the intermediate heat-passage.

3. The combination of a boiler and the fire-box thereof, an arch fitted in the upper part of the fire-box and having superposed chambers connected one with the other, means for supplying air to said chambers said upper chamber being curved to convey the air to the center of the lower chamber, and means for supporting the arch consisting of transverse water-pipes having their ends connecting directly with the water-legs of the fire-box.

In witness whereof I have hereunto set my hand.

JOHN H. HOBART.

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