W. H. MEARS.

STEAM BOILER.

APPLICATION FILED APR. 4, 1910.

1,008,554. Patented Nov. 14, 1911.

Fig. 2

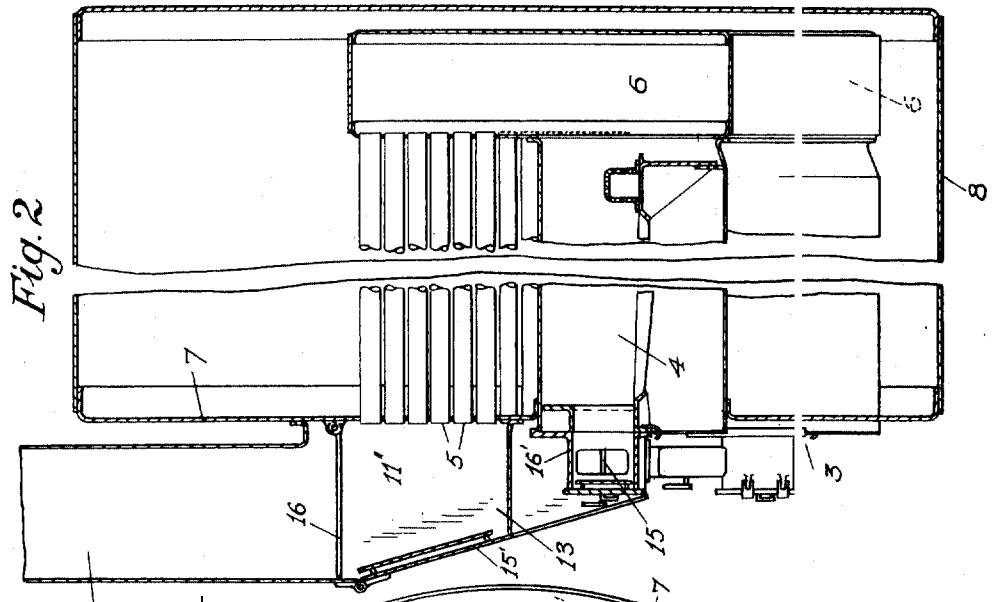
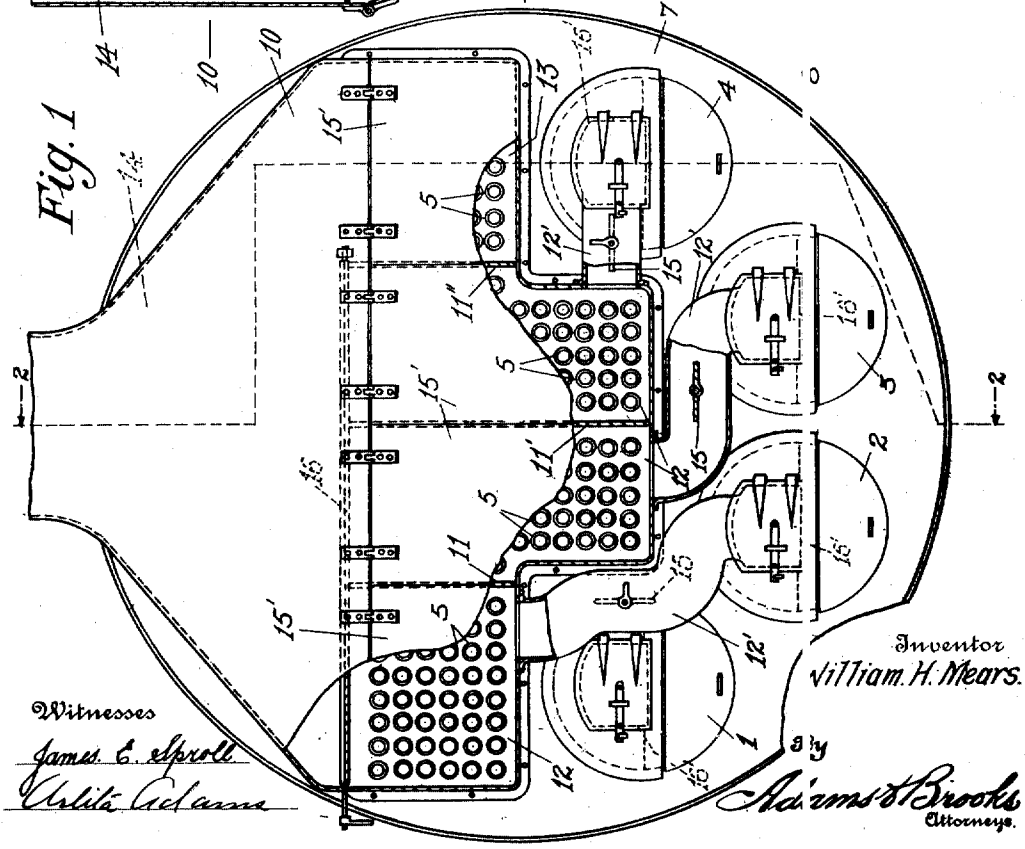


Fig. 1



Witnesses

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WILLIAM H. MEARS, OF SEATTLE, WASHINGTON, ASSIGNOR OF ONE-HALF TO SAMUEL H. MARTIN, OF SEATTLE, WASHINGTON.

STEAM-BOILER.

1,008,554. Specification of Letters Patent. Patented Nov. 14, 1911.

Application filed April 4, 1910. Serial No. 553,413.

To all whom it may concern:

Be it known that I, WILLIAM H. MEARS, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

My invention relates to improvements in boilers, having more particular reference to such devices or constructions wherein fuel economy and the consumption of smoke are the essential desiderata, and has for its primary object the provision of a novel construction of this type, particularly adapted for marine boilers, which can be installed without necessitating any alterations in the construction of the boiler proper.

With the above and other objects in view, to be referred to as my description progresses, my invention resides in the features of construction, arrangements and combinations of parts hereinafter described and succinctly defined in my annexed claims.

Referring to the accompanying drawing, wherein like numerals of reference indicate like parts throughout: Figure 1 is a front elevation of a boiler equipped with my invention, parts being broken away, and Fig. 2 is a section taken on line 2—2 of Fig. 1.

My invention is designed for use in connection with boilers of the type provided with a plurality of furnaces, in which the products of combustion are conducted from the respective furnace combustion chambers at one end of the boiler through series of tubes or flues, situated above the furnaces, to a smoke box, at the opposite end of the boiler, and for the purpose of illustration, I have shown my invention applied to a marine boiler of a well known type, in which 1, 2, 3 and 4 indicate the furnaces each of which has a separate combustion chamber, as 6, and 5 indicates sets of tubes leading forwardly from respective combustion chambers 6, through the tube plate 7, the latter forming one end wall or head for the inclosing shell 8, as is well understood.

My invention consists in providing one or more flues, each connected to receive the products of combustion from the series or nest of tubes 5 of one furnace and direct the same for discharge over the grate of the next furnace, such flues being provided by a casing 10, which can be readily substituted for and takes the place of the smoke box, as usually provided on plate 7. When employed in connection with a boiler having four furnaces, as shown, my casing 10 is divided by vertical partitions, 11, 11′, and 11″ to provide chambers 12 and 13, the former of which inclose the discharge ends of respective series of tubes 5 and are combined with hollow casing extensions 12′, having suitable dampers 15, to provide the flues, as before described, while the latter has direct communication with the uptake flue 14, leading to the chimney, by which construction the products of combustion from furnace 1 prior to passing into said uptake 14 must pass through furnaces 2, 3 and 4 and their series of tubes 5.

Reference numeral 16 indicates a pivoted damper engaging on partitions 11, 11′ and 11″ and forming the top walls of chambers 12, the same being adjustable for obtaining direct communication between said chambers and uptake 14, when it is desired or found necessary to work the furnace under natural draft.

Reference numeral 15′ indicates doors, forming the front walls of the chambers 12 and 13, these being conveniently provided to enable exposure of the tubes 5, as found desirable. While the casing or flue extensions 12′ can be otherwise arranged, I prefer that they communicate with their respective furnaces through the frames 16′, of the furnace doors, as shown.

My invention can be quickly installed, necessitating only the removal of the usual smoke box of the boiler, and while primarily aiming to provide an indirect passage for the products of combustion, permits of direct communication between tubes 5 and the chimney, being established as with the usual smoke box, upon injury of the means for creating artificial draft.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. In combination with a boiler having a plurality of furnaces each provided with a series of tubes for conducting the products of combustion therefrom through one end of the boiler, a casing secured to the last named end of said boiler over the adjacent ends of the series of tubes thereof, a plurality of vertical partitions in said casing dividing the lower portion thereof into a

series of chambers each inclosing the tubes of a respective series, the upper end portions of said partitions being spaced from the upper wall of said casing, that portion of said casing above said chambers forming an uptake flue, a plate supported for movement in said casing constituting a damper and forming top walls of all but one of said chambers, and extensions from said last named chambers forming flues each connected with a respective adjoining furnace, as specified.

2. In combination with a boiler having a plurality of furnaces each provided with a series of tubes for conducting products of combustion therefrom through one end of the boiler, a casing secured to the last named end of said boiler over the adjacent ends of the series of tubes thereof, a plurality of vertical partitions in said casing dividing the lower portion thereof into a series of chambers each inclosing the tubes of said partitions being spaced from the upper wall of said casing, that portion of said casing above said chambers forming an uptake flue, a plate hinged in said casing for movement toward and from said partitions for cutting off direct communication between a plurality of said chambers and said uptake flue, one of said chambers lying to one side of said plate so as to have constant and direct communication with said uptake flue, and extensions from the chambers controlled by said plate each extending to a respective adjacent furnace and forming a flue, whereby the unconsumed products in one of said chambers will be directed for passage into the adjacent furnace.

Signed at Seattle, Washington this 26th day of March 1910.

WILLIAM H. MEARS.

Witnesses:
SAM H. MARTIN,
W. GILHOLM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."