(No Model.)

R. B. AYRES.

STEAM BOILER.

No. 346,837. Patented Aug. 3, 1886.

Fig. 2.

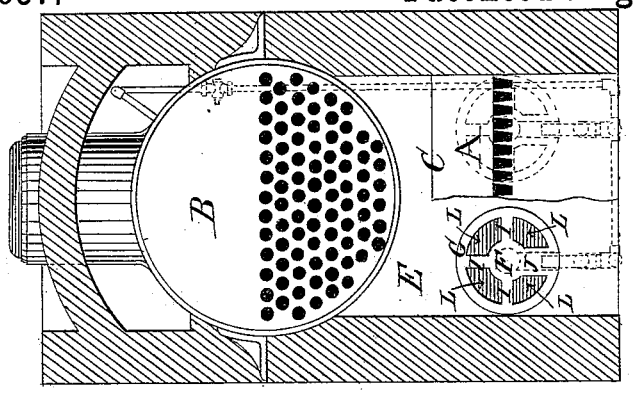
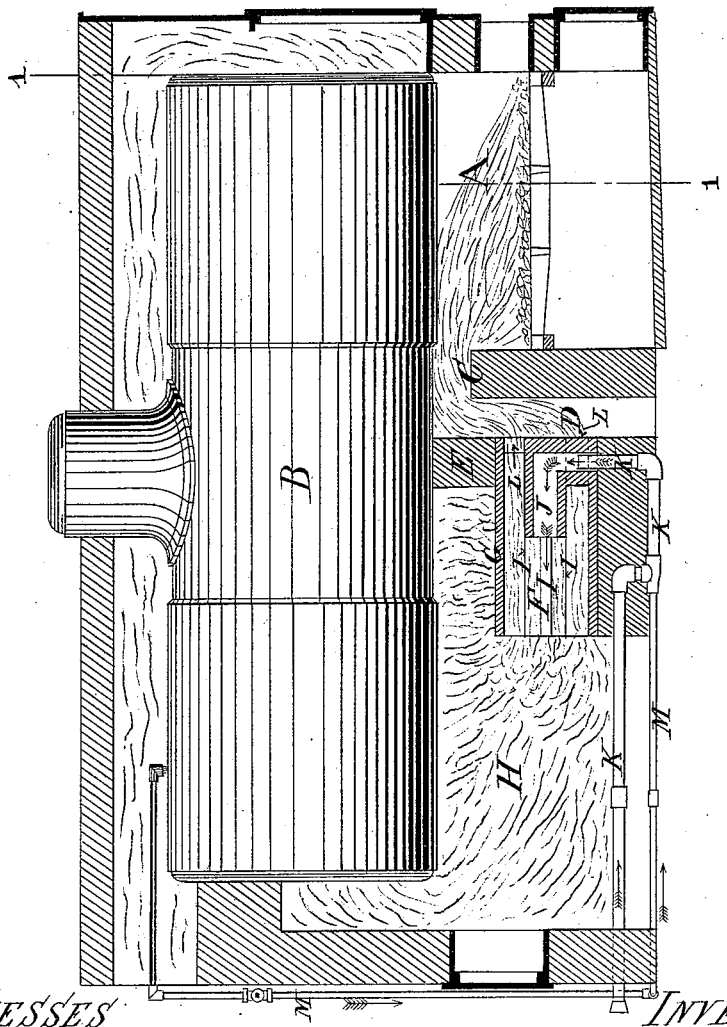


Fig. 1.



WITNESSES
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his attorney

UNITED STATES PATENT OFFICE.

RUBEN B. AYRES, OF ST. LOUIS, MISSOURI.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 346,837, dated August 3, 1886.

Application filed February 10, 1886. Serial No. 191,390. (No model.)

To all whom it may concern:

Be it known that I, RUBEN B. AYRES, of the city of St. Louis, State of Missouri, have invented certain new and useful Improved Heat-Generators for Steam-Boiler and other Furnaces, of which the following is a full, clear, and exact description.

My invention relates to improved means for increasing or intensifying the heat produced from the combustion of fuel in steam-boiler and other furnaces, and has for its object to economize fuel and increase the efficiency of the apparatus to which such heat may be applied.

It consists in the application to the combustion or other flue of a furnace of a heat-generating chamber or retort, through which the products of combustion from the furnace are caused to pass, and in which they are combined or mixed with fresh air, so that on their exit from the chamber or retort into the flues an active combustion of the unconsumed gases ensues, and an intense heat is thereby generated.

On the accompanying drawings, Figure 1 represents a longitudinal section of a steam-boiler furnace and flues with my invention applied thereto; and Fig. 2, a transverse section, partly broken away, on line 1 1 in Fig. 1, like letters of reference denoting like parts in both the figures.

A represents the furnace, in which the combustion of fuel takes place for generating steam in the cylindrical tubular boiler B.

C is the ordinary fire-bridge, and D an upright space between the bridge C and the wall E, which extends upward to the lower portion of the boiler B, and closes the space usually occurring thereat for the passage of the flames and gases from the furnace A along the bottom of the boiler B.

In the wall E are fitted or built two (or one or more than two) chambers or retorts, F, which may be either cylindrical, as shown, or of a rectangular, oval, or other shape, as may be found most suitable for their adaptation to the arrangements and requirements of the various furnace-flues to which they may be applied. Each chamber or retort F is composed of a cylindrical shell or casing, G, of any desired diameter and length, and open at both ends, one end opening through the wall E into the space D in rear of the furnace A and its other end into the combustion-flue H. The shell or casing G is united radially by partitions I to a central box or pocket, J, which is closed at the furnace end of the chamber or retort F, and extends about half-way (more or less) along the central portion of the latter, into which its other end opens.

K represents an air-pipe, which conducts fresh air to the box or pocket J, and through the latter to the interior of the chamber or retort F, as indicated by the arrows in Fig. 1.

By the above arrangement a series of openings or passages, L, are formed in the end of each chamber or retort F adjacent to the furnace A, and, the wall E being closed everywhere except at these openings L, the products of combustion from the furnace A are compelled to pass through the same, and are uniformly distributed by the partitions I into the chamber or retort F, where they mix with the fresh air from the central box or pocket, J, and on the combined gases issuing from the other or inner end of the chamber or retort F into the flue H a sudden and active combustion takes place within the latter, whereby the unconsumed products of combustion are thoroughly ignited, and greatly increased heating-power, which would otherwise be wasted, is imparted to the boiler or other apparatus. The admission of air to the chamber or retort F may be accelerated and the effect thereof improved, if desired, by introducing a jet of steam through the pipe M into the central box or pocket, J.

By my invention a considerable saving in the consumption of fuel is effected and smoke prevented.

I am aware that furnaces having air-heating retorts discharging into a combustion-chamber are not new, and I do not desire to claim the same, broadly.

I claim—

The combination of the fire-chamber A, close partition-wall E, casing G, having outer flues, L, and inner blast-flue, J, said flues leading to the combustion-chamber H, substantially as and for the purpose specified.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 30th day of January, 1886.

RUBEN B. AYRES.

Witnesses:

PAUL BAKEWELL,

J. W. CROOKES.