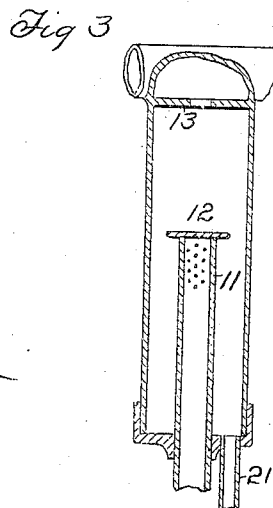
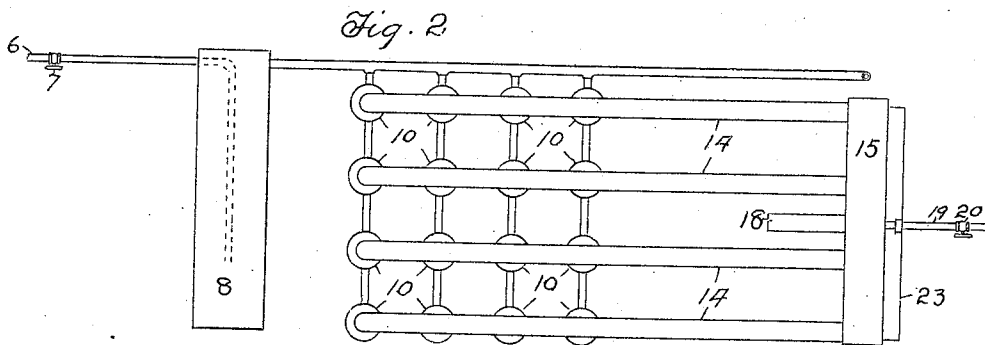
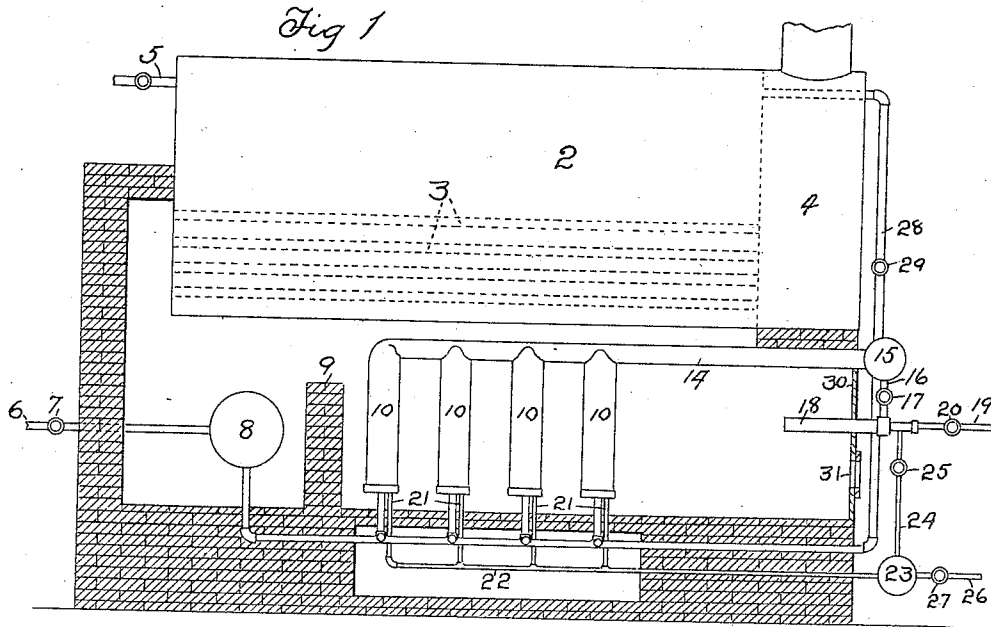


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 PROCESS FOR ECONOMIZING FUEL.
 APPLICATION FILED OCT. 22, 1908.

942,530.

Patented Dec. 7, 1909.



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UNITED STATES PATENT OFFICE.

DELOS ALLEN AND ALEXANDER C. PYPER, OF LOS ANGELES, CALIFORNIA.

PROCESS FOR ECONOMIZING FUEL.

942,530.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed October 22, 1908. Serial No. 459,085.

To all whom it may concern:

Be it known that we, DELOS ALLEN and ALEXANDER C. PYPER, citizens of the United States of America, residing at Los Angeles, county of Los Angeles, State of California, have invented a certain new and useful Process for Economizing Fuel; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a process for economizing fuel, and consists substantially in delivering steam to a chamber, heating it therein, conducting a portion of the heated product from the upper part of said chamber to a burner, mingling it with said fuel, and igniting the mixture. The heated product from the lower part of the above mentioned chamber may also be discharged to said burner or in the immediate vicinity thereof, or may be otherwise utilized.

An apparatus whereby the process may be carried on is herein described, and is illustrated in the accompanying drawing, in which—

Figure 1 is a side elevation of the apparatus applied to a steam boiler, the boiler setting being in section; Fig. 2 is a plan view of the above, omitting the boiler and setting, and Fig. 3 is a section of one of the heating chambers.

The boiler 2 having flues 3 and smoke-box 4 may be of any suitable construction, and may deliver steam through pipe 5 to any motive, heating, or other steam utilizing apparatus (not shown). The exhaust steam is returned through pipe 6 controlled by valve 7 to pre-heater 8, where it is heated by the gases passing over a bridge 9. From the pre-heater the steam is discharged to a plurality of chambers 10 through pipes 11 (Fig. 3) in each of said chambers, said pipes extending up into said chambers, being perforated at their upper ends and being provided with baffle-plates 12 at this point. The upper ends of chambers 10 are provided with perforated diaphragms 13 and with pipes 14 communicating with receiver 15. Pipe 16 controlled by valve 17 connects receiver 15 with burner 18. Pipe 19 controlled by valve 20 connects burner 18 with any source of hydro-carbon supply (not shown).

From the lower ends of chambers 10 pipes

21 lead through pipes 22 to receiver 23. Pipe 24 controlled by valve 25 connects receiver 23 with burner 18. An outlet pipe 26 controlled by valve 27, is also provided for receiver 23; said valve 27 being partially opened in operation to permit escape of the steam to the atmosphere, or it may be more fully opened when the escaping steam is utilized for heating water or other purpose. A pipe 28 controlled by valve 29 leads from the steam space of boiler 2 to pipes 11. The furnace front 30 is provided with an inlet 31.

In the operation of this invention, exhaust steam flows through pipes 6 to pre-heater 8, which may be of any suitable or approved construction, thence to chambers 10. Here it is intensely heated by the flame from burner 18. The lighter constituents of the steam pass through pipes 14 and receiver 15 to burner 18, meeting the hydro-carbon supplied by pipe 19 at this point. Issuing therefrom, the combined hydro-carbon and said lighter constituents are consumed under boiler 2, air for combustion being supplied through inlets 31. While the heavier constituents are preferably utilized in connection with a water heater or other heat utilizing apparatus, it will be understood that when desired they may be also conducted from the lower ends of chambers 10 to the burner 18 to aid in the process of combustion. Pipe 28 allows the use of live steam during such time as exhaust steam is not available.

We claim:

1. In a fuel economizing process, passing steam into a chamber, heating it therein, effecting a separation therefrom of the lighter constituents of the steam at a high degree of heat, and mingling said constituents at a high degree of heat with a fuel in a combustion chamber.

2. In a fuel economizing process, passing steam into a chamber, heating it therein, effecting a separation therefrom of the lighter constituents of the steam at a high degree of temperature, and mingling said constituents at a high degree of temperature with hydro-carbon, and discharging the mixture into a combustion chamber.

3. In a fuel economizing process, passing steam into a preheating chamber, thence passing it into a second chamber, heating it therein to a higher temperature, effecting a

separation therefrom of the lighter constituents of the steam at a high temperature, then mingling the lighter constituents thereof with a fuel, and discharging the resulting
5 mixture at a high degree of temperature into a flame in a combustion chamber.

In testimony whereof, we have signed our names to this specification in the presence of

two subscribing witnesses at Los Angeles,
county of Los Angeles, State of California. 10

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Witnesses:

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