

No. 745,130.

PATENTED NOV. 24, 1903.

J. ZIEGLER.
COMBINED HOT WATER AND HOT AIR FURNACE.
APPLICATION FILED MAY 26, 1903.

DEL.

Fig. 1.

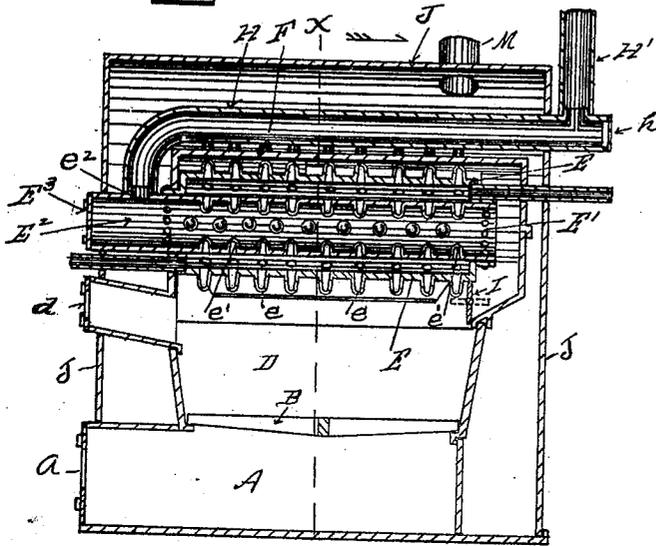
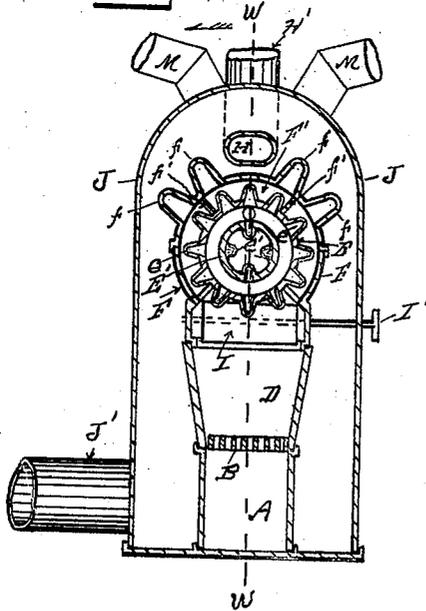


Fig. 2.



Witnesses.
Vernie Stockert.
Basnett

Inventor.
Jacob Ziegler
By J. C. & H. M. Sturgeon
Attys

UNITED STATES PATENT OFFICE.

JACOB ZIEGLER, OF ERIE, PENNSYLVANIA.

COMBINED HOT-WATER AND HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 745,130, dated November 24, 1903.

Application filed May 26, 1903. Serial No. 158,877. (No model.)

To all whom it may concern:

Be it known that I, JACOB ZIEGLER, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in a Combined Hot-Water and Hot-Air Furnace; and I 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention relates to combined hot-water and hot-air heating-furnaces, and has for its object the construction of a furnace for heating houses in which there is a small boiler combined therewith in such a manner that water is heated therein for circulation through an ordinary hot-water heating system, and at the same time air is heated by the furnace to be supplied to registers for heating rooms in the usual manner.

The features of my invention are hereinafter set forth and described, and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of my improved furnace on the line *w w* in Fig. 2. Fig. 2 is a transverse vertical section on the line *X X* in Fig. 1.

In the drawings illustrating my invention, A is the ash-box; *a*, the ash-box door; B, the grates; D, the fire-box, and *d* the fire-box door. Above the fire-box there is mounted a horizontal boiler consisting of an outer shell E and an inner shell E', which inner shell E' operates as a flue, and extending outwardly from the shell E there are hollow projections *e*, and extending inwardly from the shell E' there are hollow projections *e'*. Resting upon the top of the sides and the front end of the fire-box D there is a casing F, which surrounds the boiler and which is provided with outwardly-projecting hollow projections *f*, and between the upper part of the outer shell E of the boiler and the inside of the casing F there are two walls *f' f'*, which extend from the rear of the boiler forward, so as to form a flue F' over the rear end of the boiler approximately one-half of its length and which operates as the heat rises up from the fire-box

between the casing F and the outside shell E of the boiler as a flue through which the products of combustion pass over the top of the boiler to the rear end thereof. At the front end of the boiler the inner shell E' thereof is provided with an extension E², the outer end of which is closed by a hand-hole plate E³, and in the upper side of this extension there is an opening *e*², to which a flue H is connected which passes up and over the top of the casing F to a point beyond the rear of the boiler, where it is provided with an exit-flue H' and a hand-hole *h*. It will be observed that in this construction the heat and products of combustion arise from the fire-box and pass up inside of the casing F, around the outside shell E of the boiler, and through the flue F' to the rear end of the boiler, and thence forward, through the flue formed by the inside shell E' of the boiler and the extension E² thereof, to the flue H, and thence up and back therethrough over the top of the casing F to the outlet-flue H'. Between the top of the rear of the fire-box D and the rear end of the outside shell E' of the boiler I place a transverse damper I, provided with a handle I' for turning it, so that for a quick fire the damper I can be turned and the products of combustion can pass directly from the fire-box D up past the damper I and directly into the central flue of the boiler and thence out, as hereinbefore described.

Around the entire structure hereinbefore described I place a casing J, with one or more air-inlet openings J' at the bottom thereof. This casing J extends up and around the furnace structure so as to inclose the same in the usual manner, and in the top thereof it is provided with openings for hot-air-conducting pipes M M, as may be desired, and the air passing up between this casing J and the outside walls of the fire-box D and up around the outside of the casing F, and between and around the projections *f* thereon, and in contact with the flue H over the top of the casing F operates to heat it, and it finally passes out through the distributing-pipes M M, so that the waste heat of the water-heater is utilized to heat air, and, vice versa, the waste heat of the usual hot-air furnace is used for heating water, and in this manner I can utilize the heat so as to heat

some rooms with hot air and others with hot water, and thereby do the same at a minimum expense for fuel.

I have thus shown and described my invention so as to enable others to construct and use the same, and

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination in a heating-furnace, of a boiler over the fire-box having a large flue through its center, a system of flues for conducting the products of combustion around the boiler and through a flue to the rear of the boiler and back through the flue in the center of the boiler and thence to the exit-flue, a casing around the boiler having hollow projections extending outwardly therefrom, and an outside casing surrounding the structure having an air-inlet opening in the bottom thereof and air-outlet openings at the top thereof substantially as set forth.

2. The combination in a heating-furnace, of a fire-box, a horizontal boiler over the fire-box, a flue through the center of the boiler,

hollow projections extending outwardly from the outer shell and inwardly from the inner shell of the boiler, a casing extending from the top of the fire-box up around the boiler, hollow projections extending outwardly therefrom, radial walls between the outer wall of the boiler and said casing whereby a flue is formed by the outer wall of the boiler, the casing and said radial walls extending from the rear of the boiler toward the front end thereof, a flue extending from the front end of the central flue of the boiler up over and along the top of said casing to an exit-flue at the rear of the boiler, and an outer casing surrounding said structure, and having air-inlet openings in the base thereof, and air-outlet openings at the top thereof, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JACOB ZIEGLER.

Witnesses:

F. J. BASSETT,

CHARLES A. MERTENS.