

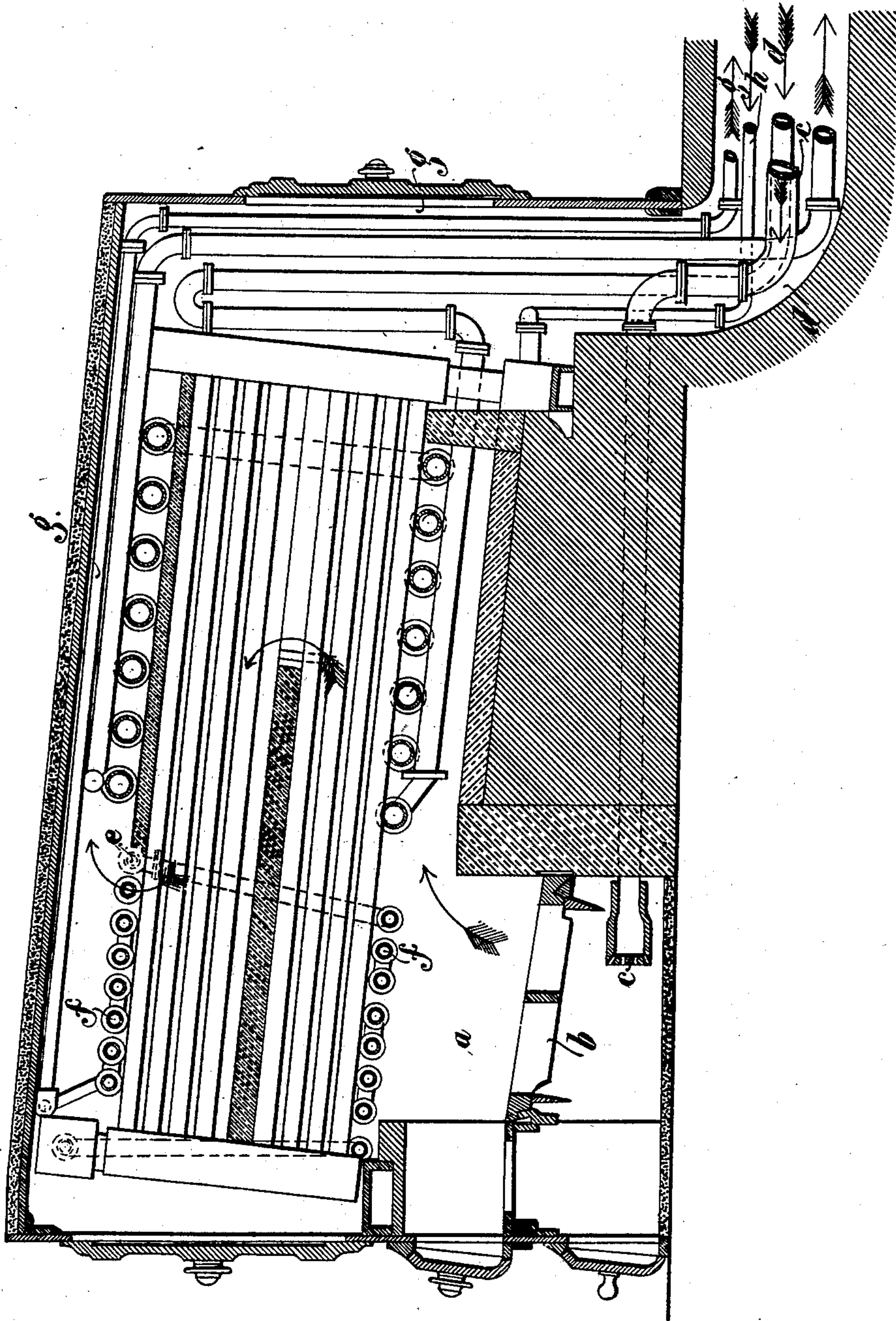
No. 666,180.

Patented Jan. 15, 1901.

H. A. BUCK.
BOILER FURNACE.

(Application filed Sept. 10, 1900.)

(No Model.)



Witnesses:

John H. Hinton

Percy C. Bowen

Inventor:

H. A. Buck

by Wilkinson & Fisher

Attorneys.

UNITED STATES PATENT OFFICE.

HENRY ALONZO BUCK, OF STAFFORD, CONNECTICUT.

BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 666,180, dated January 15, 1901.

Application filed September 10, 1900. Serial No. 29,603. (No model.)

To all whom it may concern:

Be it known that I, HENRY ALONZO BUCK, a citizen of the United States of America, residing at West Stafford, Connecticut, have
5 invented new and useful Improvements in Boiler-Furnaces, of which the following is a specification.

My invention relates to a boiler-furnace of the kind in which the air necessary for combustion is passed through a suitable tubular system. This manner of providing the air for combustion, according to the present invention, does not aim at forcing combustion in the manner of similar known furnaces, its
10 object consisting solely in passing the products of combustion through a conduit in which are arranged the air-supply pipes and the discharge-pipe for the steam or hot water. In this conduit may also be arranged the water-feeding pipes. It will be easily understood that by such arrangement the air necessary for combustion is preliminarily heated, while the steam or the hot water drawn off will be additionally heated or dried, although not
15 superheated and in the best case protected in a most effective manner against loss of heat through radiation.

In the accompanying drawing the invention is represented as arranged in connection
20 with a tubular boiler which is shown in section. In this arrangement it is immaterial whether the boiler is connected with a special steam-chamber or whether the final product is only hot water which is to be delivered at
25 a suitable place.

The fire-box *a* receives the air necessary for combustion from below the fire-grate *b* through a pipe *c*, terminating in a rose, nozzle, or perforated end. Both the doors of the
30 fire-box and of the ash-pit are so fitted that they can be closed in an air-tight manner. The fire-gases pass along, as indicated by the arrows, heating on their way the water circulating in the boiler and passing out finally into
35 a passage *d*, in which they are led before being allowed to escape into the chimney close to the place where the steam or hot water is to be used.

The air-supply pipe *c* is supplied with the
40 air required for combustion by a ventilator or other suitable blast device. The same end can also be obtained by arranging an ex-

hauster in a suitable portion of the passage
45 *d*. Inasmuch as the greatest part of the air-supply pipe *c* is contained within the passage
50 *d*, it will be understood that the air before reaching the grate will have received a considerable amount of heat.

The steam or the hot water is drawn off at
55 *e*. The steam or the water may also be passed through a serpentine coil *f*, provided around the front portion of the boiler. In either case the heated product is passed into a pipe *g*, which carries it to the place where it is required; but even this pipe *g* passes, in accordance with the principle of this invention,
60 through the said passage *d* in such a manner that the fluid contained in the pipe *g* (hot water or steam) is further heated in the passage *d* or at least protected against loss of
65 heat.

The water is supplied to the boiler through a pipe *h*, which is also placed in the said passage *d* in such a manner that the water acquires at the expense of the escaping fire-
70 gases a considerable degree of heat before reaching the boiler.

I claim—

1. In a water-tube boiler, the combination with a furnace; of the water-tubes, arranged
75 above said furnace, a series of pipes within said furnace to receive the steam from said water-tubes, a pipe *g* for conducting steam away from said pipes, and means for heating the pipe *g*, a series of superheating-pipes also
80 arranged within said furnace, and a return-pipe for conducting the steam after being used once to said superheating-pipes; and means for heating said return-pipe; substantially as described.

2. In a water-tube boiler, the combination with a furnace; of the water-tubes, arranged
85 above said furnace, a series of pipes arranged at right angles above and below said water-tubes within said furnace to receive the steam
90 from said water-tubes, a pipe *g* for conducting steam away from said pipes, and means for heating the pipe *g*, a series of superheating-pipes also arranged within said furnace and at right angles above and below said water-tubes, and a return-pipe for conducting
95 the steam after being used once to said superheating-pipes; and means for heating said return-pipe; substantially as described.

3. In a water-tube boiler, the combination
with a furnace, and means for introducing
warm air below the grate in said furnace; of
the water-tubes arranged above said furnace,
5 a series of pipes *f* arranged at right angles
with said water-tubes to receive the steam
therefrom, a pipe *g* connected with said series
of pipes *f* for conducting the steam away and
means for heating said pipe *g*, a series of su-
10 perheating-pipes arranged at right angles to
said water-tubes in the furnace, a return-

pipe for conducting the steam after being
once used to said superheating-pipes, and
means for heating said return-pipe; substan-
tially as described.

15

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

HENRY ALONZO BUCK.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.