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No. 771,278.

PATENTED OCT. 4, 1904.

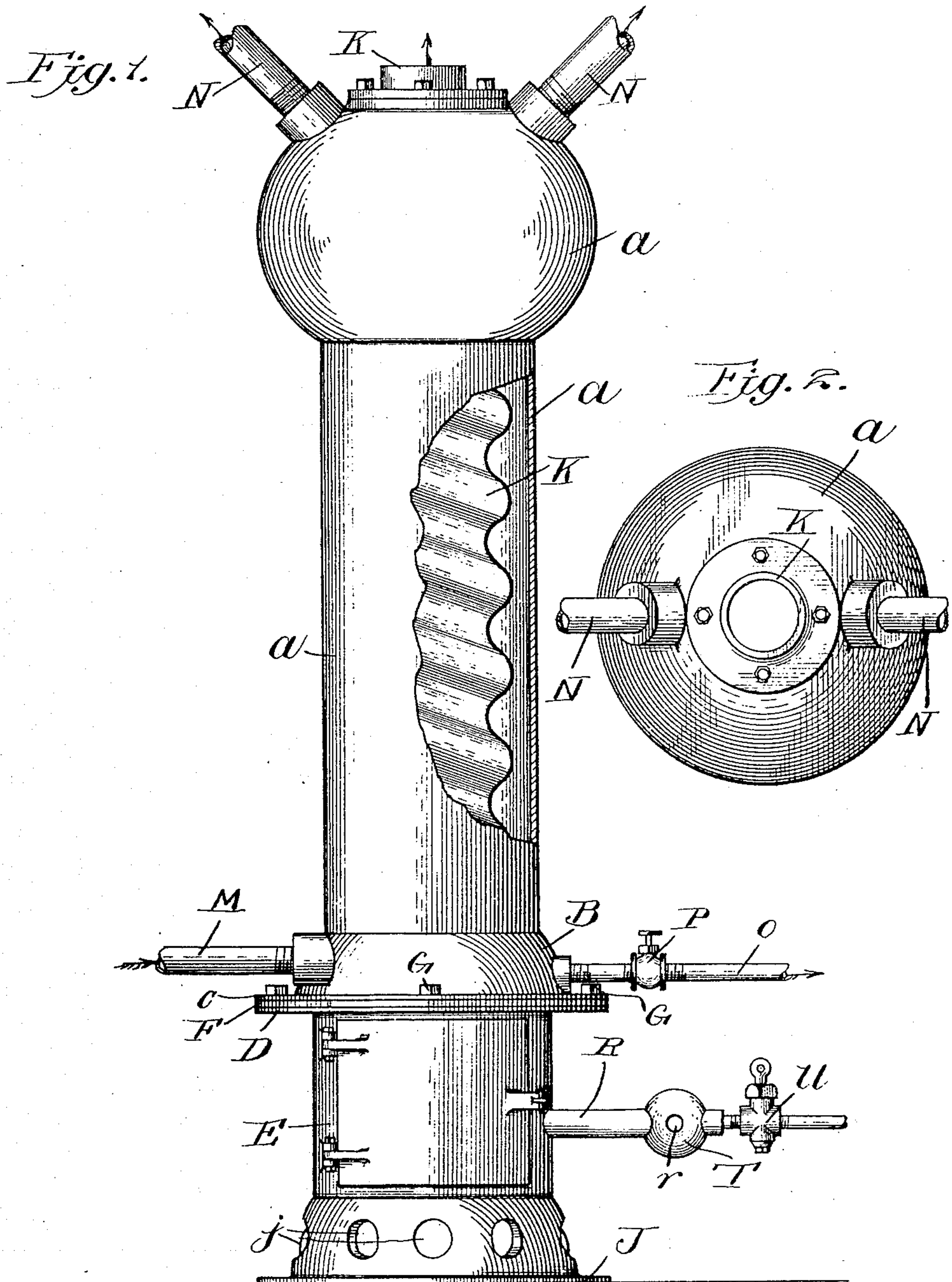
E. H. SCHWARTZ.

BOILER.

APPLICATION FILED MAY 2, 1904.

NO MODEL.

2 SHEETS—SHEET .1



Witnesses:

Robert H. Allen
E. C. Donarum.

Inventor:

Edward H. Schwartz
By *Raymond H. [unclear]*
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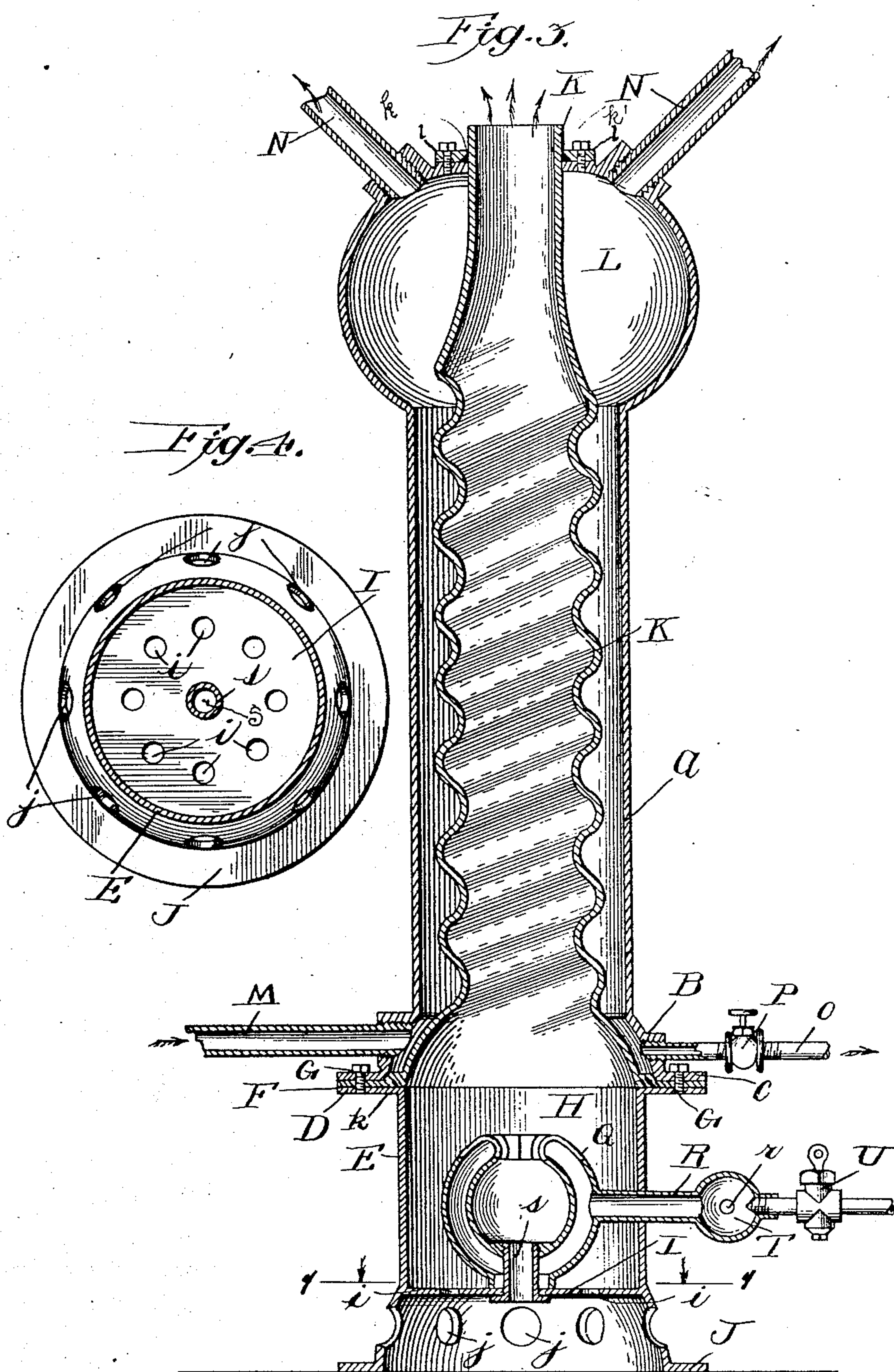
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Witnesses:
Robert Allen
G. D. Domarus.

Inventor:
Edward H. Schwartz
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BEST AVAILABLE COPY UNITED STATES PATENT OFFICE.

EDWARD H. SCHWARTZ, OF CHICAGO, ILLINOIS.

BOILER.

SPECIFICATION forming part of Letters Patent No. 771,278, dated October 4, 1904.

Application filed May 2, 1904. Serial No. 205,966. (No model.)

To all whom it may concern:

Be it known that I, EDWARD H. SCHWARTZ, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Boilers, of which the following is a specification.

My invention relates to improvements in apparatus for quickly heating water or generating steam.

The object of my invention is to produce an apparatus which will rapidly heat water or generate steam and which will effectively utilize the heating medium to the best advantage and which shall at the same time be simple, inexpensive, strong, effective, and readily operated, repaired, and cleaned. This and such other objects as may hereinafter appear are attained by the devices shown in the accompanying drawings, in which—

Figure 1 is an elevation of a preferred embodiment of my invention, showing a part of the outer casing broken away. Fig. 2 is a plan view thereof. Fig. 3 is a vertical sectional view thereof, and Fig. 4 is a horizontal sectional view on the line 4 4 of Fig. 3.

Like letters of reference indicate the same parts in the several figures in the drawings.

Referring by letter to the accompanying drawings, A is the outer shell or casing, which is mounted upon a flanged base B. The base B is provided with a flange C and rests upon the flange D of the heater-casing E, the flanges C and D being clamped together by means of screws G. The casing E incloses a combustion-chamber H, the bottom of which is formed by a web I. Suitable air-supply ports *i* are provided, and other air-ports *j* are also provided in the base of the apparatus, which base extends into a supporting-flange J. K is a stack or chimney leading from the combustion-chamber H and provided with a flange F, which is beveled at its periphery and is clamped between the flanges C and D. The stack or chimney K is spirally corrugated, as shown, and extends through the top of the casing A to the atmosphere, so as to provide a vent for the escape of the unconsumed products of combustion.

In order to provide for the expansion and

contraction of the casing and the stack, respectively, the upper end of the stack which passes through the top of the casing is made cylindrical, and the joint between the top of the casing and the stack is kept tight by means of packing *k*, mounted within an annular recess provided therefor between the top of the casing A and a plate *l*, which is secured to the top of the casing by screws or in any other suitable manner, thus providing in substance a stuffing-box through which the cylindrical end of the chimney extends. The space between the casing A and the corrugated portion of the stack K constitutes a water-heating chamber, which extends into an expansion-chamber L, which is formed by an enlargement of the upper end of the casing A.

M is a water-supply pipe leading into the lower portion of the water-heating chamber, and N represents discharge-pipes for the outlet of hot water or steam, as the case may be.

O is a flushing or blow-off pipe, which is normally closed by means of the valve P.

Q is a burner such as is illustrated in and forms the subject-matter of my copending application, Serial No. 189,872, and is supplied with a fuel through the inlet-pipe R and with air through the ports *i* and through the port S and also through the ports *v*, which open into the mixing-chamber T.

U is the valve for controlling the supply of fuel to the burner Q. This burner is conveniently secured in position by means of a nipple *s*, through which extends the air-port S. The lower end of the nipple *s* is provided with an outwardly-extending flange, and the upper end of the nipple is threaded and is screwed into a thickened portion of the inner wall of the hollow shell or burner Q. By this means the burner is readily mounted and clamped in position and the apparatus may be readily disassembled. It will also be noted that the parts of my device are so assembled that by removing the bolts G the casing-shell and heater-casing E may be readily taken apart.

In the operation of my device water is admitted through the pipe M and is guided by the external corrugations on the casing K so as to pass spirally upward within the water-heating chamber to the expansion-chamber L.

By means of this spiral action the water is given a maximum travel while passing from the pipe M to the expansion-chamber L, and thus is given the best opportunity to absorb a maximum amount of the heat radiated through the casing K, which is preferably of thin polished metal. Fuel being admitted to the burner Q, which burner, however, may be taken primarily as merely typical of any suitable combustion device, the resulting heat, burning gases, and products of combustion are caused to pass upwardly within the stack K and are also given more or less of a spiral travel, thereby retarding their escape from the stack K and increasing the time during which they will part with their heat, which is absorbed by the water-jacket surrounding the stack K. It will thus be seen that I obtain a continuous-flow water-heater in which the burning gases are surrounded by a water-jacket, which is separated from the gases only by a thin metallic casing, which readily conducts the heat to the water, so that the water is raised to a high temperature while passing from the bottom to the top of the water-chamber. From the expansion-chamber L the water or steam may be conducted, as desired, through the pipes N.

It will be understood that I do not necessarily limit myself to the exact structure of the apparatus as shown, but that various changes in form may be made without departing from the spirit of my invention, which contemplates such changes.

I claim—

1. A heater comprising a casing inclosing a water-chamber and mounted upon a casing inclosing a combustion-chamber, a spirally-corrugated stack extending upwardly from said combustion-chamber through said water-chamber to the atmosphere, and leading from

the combustion-chamber, means for supplying water to the water-chamber and for conducting water from the water-chamber, and means for generating heat within the combustion-chamber.

2. The combination with a casing containing a combustion-chamber provided with a stack leading therefrom to the atmosphere, of a casing surrounding said stack, the space between said casing and said stack constituting a water-chamber, means for supplying water to said water-chamber and means for conducting heated water from the upper portion of said water-chamber.

3. The combination with a casing inclosing a combustion-chamber, of a spirally-corrugated stack leading upward from said combustion-chamber to the atmosphere, a casing surrounding said stack, said casing being enlarged at a point above its base to form an expansion-chamber, the space between said stack and said casing constituting a water-chamber, means for supplying water to said water-chamber, and means for conducting water from the upper end thereof, substantially as described.

4. The combination with a casing surrounding a water-chamber, of a casing containing a combustion-chamber, a stack communicating with said combustion-chamber and extending upwardly through said water-chamber to the atmosphere, and packing arranged to form a joint around said stack where it passes out of said casing, said stack adjacent to said packing being of substantially uniform dimensions so as to permit of the longitudinal movement of said stack without opening said joint.

EDWARD H. SCHWARTZ.

Witnesses:

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O. R. BARNETT.