(No Model.) 5 Sheets—Sheet 1.

O. W. NOBLE.

HOT WATER BOILER.

No. 382,660. Patented May 8, 1888.

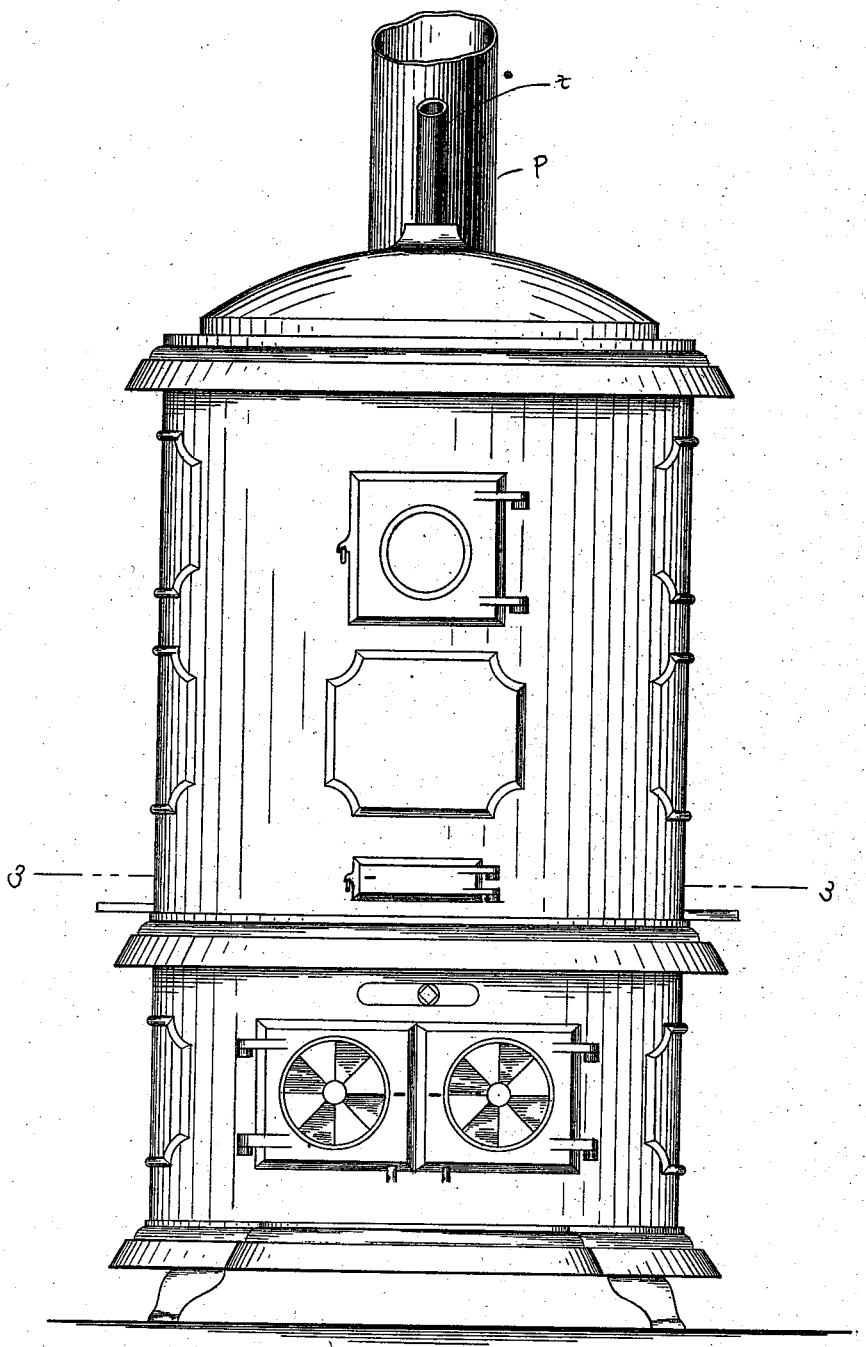

Fig. 1.

WITNESSES:
E. E. Hamlb.
E. L. Blackwell.

INVENTOR:
O. W. Noble.
By C. B. Tuttle,
Atty.

(No Model.) 5 Sheets—Sheet 2.

O. W. NOBLE.

HOT WATER BOILER.

No. 382,660. Patented May 8, 1888.

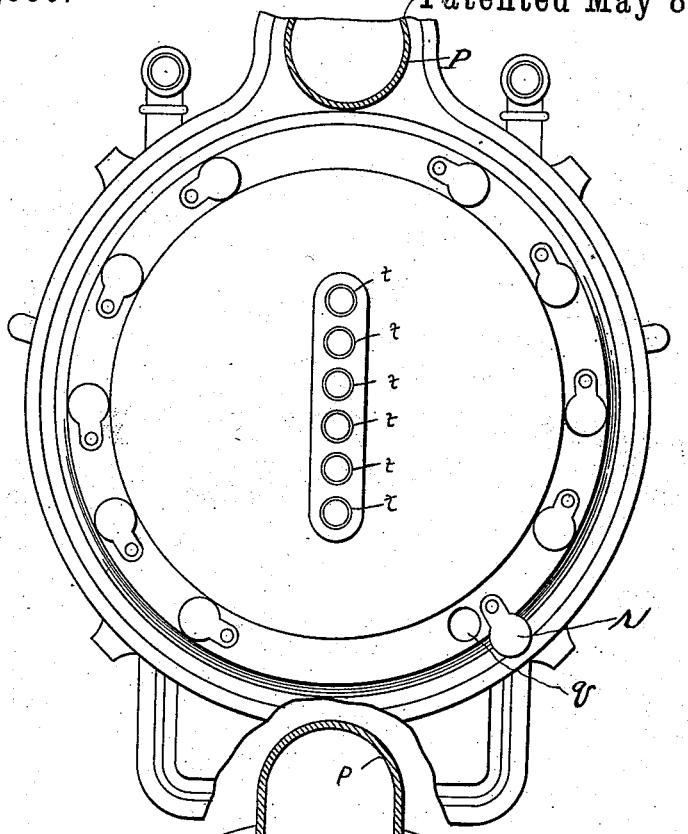

Fig. 2.

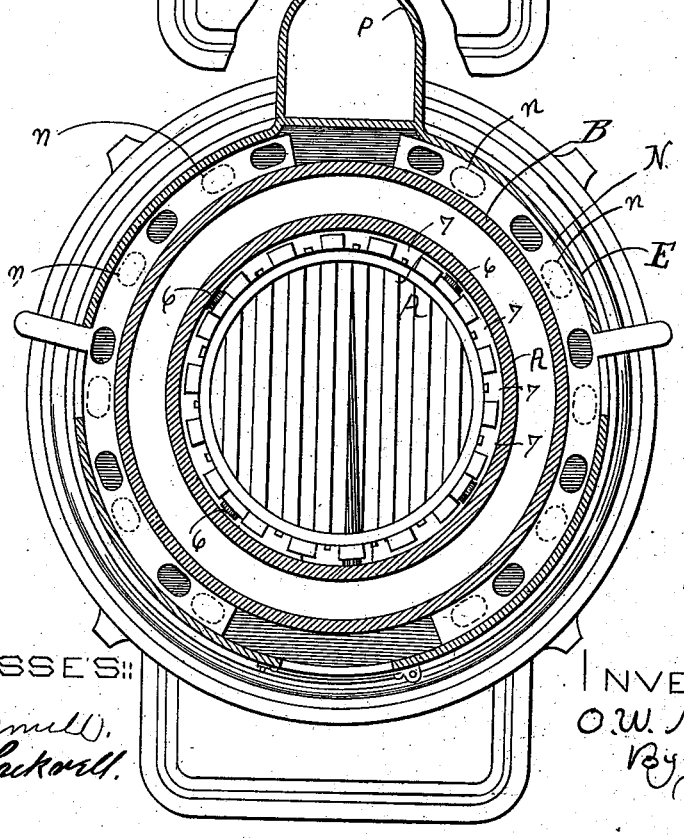

Fig. 3.

WITNESSES:
C. C. Hamill.
E. M. Blackwell.

INVENTOR:
O. W. Noble.
By C. B. Tutts
Atty

(No Model.)

5 Sheets—Sheet 3.

O. W. NOBLE.

HOT WATER BOILER.

No. 382,660. Patented May 8, 1888.

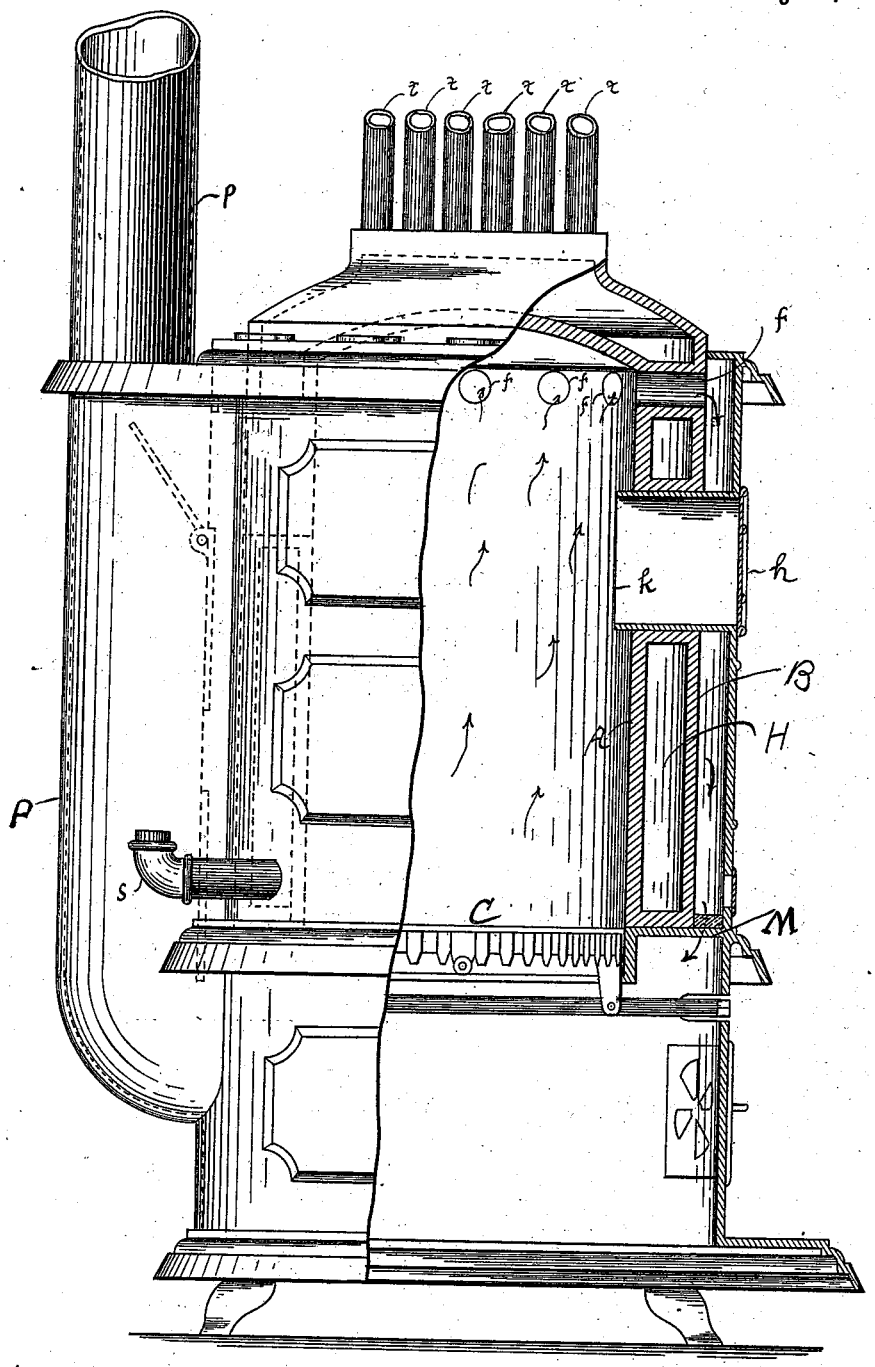

Fig. 4.

WITNESSES:
E. E. Hamilb.
E. L. Blackwell.

INVENTOR:
O. W. Noble.
By C. B. Tuttle
Atty.

(No Model.)

5 Sheets—Sheet 4.

O. W. NOBLE.

HOT WATER BOILER.

No. 382,660. Patented May 8, 1888.

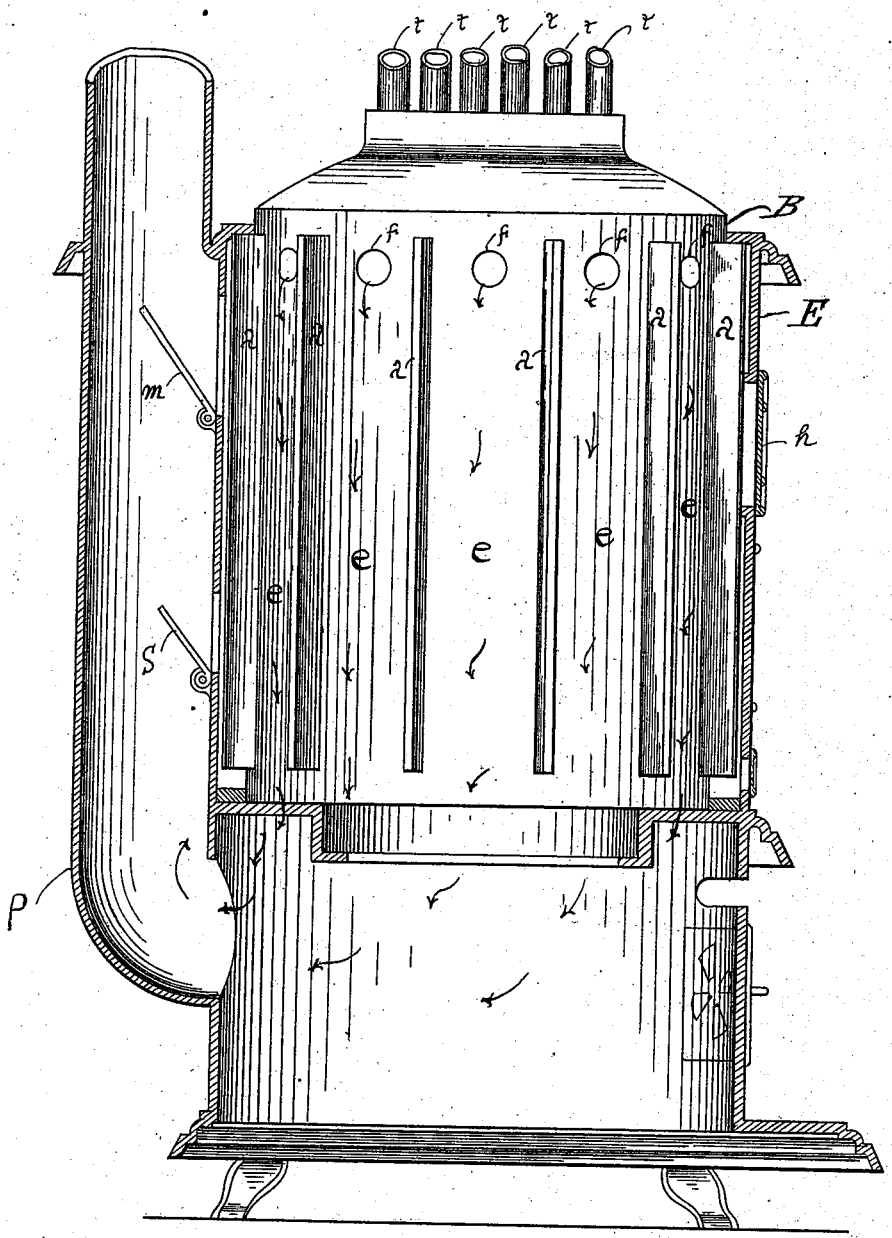

Fig. 5.

WITNESSES:
E. E. Hamill.
E. D. Blackwell.

INVENTOR:
O. W. Noble.
By C. B. Tuttle,
Atty.

(No Model.)

5 Sheets—Sheet 5.

O. W. NOBLE.

HOT WATER BOILER.

No. 382,660.

Patented May 8, 1888.

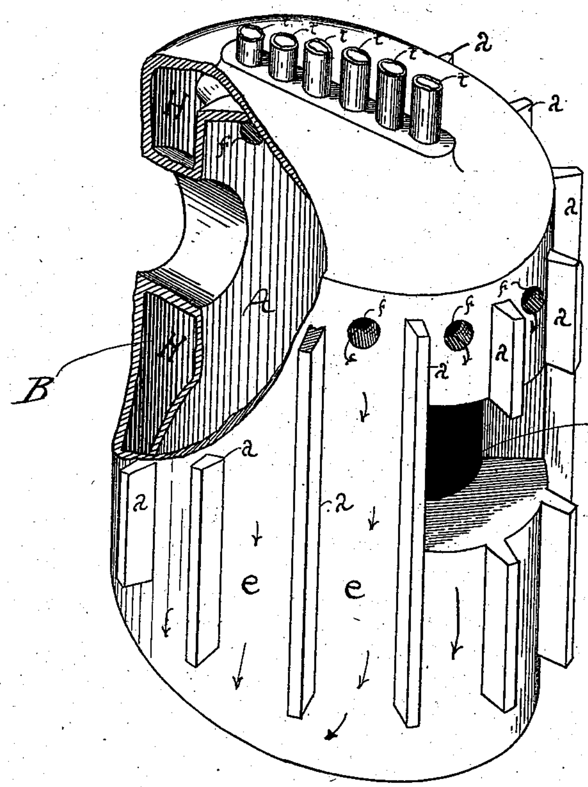

Fig. 6.

WITNESSES:
E. E. Hamill
E. D. Blackwell.

INVENTOR:
O. W. Noble.
By C. B. Tuttle,
Att'y.

UNITED STATES PATENT OFFICE.

OSCAR W. NOBLE, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE NOBLE STOVE COMPANY, OF MANCHESTER, NEW HAMPSHIRE.

HOT-WATER BOILER.

SPECIFICATION forming part of Letters Patent No. 382,660, dated May 8, 1888.

Application filed September 1, 1887. Serial No. 248,461. (No model.)

To all whom it may concern:

Be it known that I, OSCAR W. NOBLE, of Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Hot-Water Boilers, of which the following, taken in connection with the accompanying drawings, is a specification.

The nature of this invention is hereinafter fully described, and then specifically pointed out in the claims.

Referring to the drawings, Figure 1 is a front elevation of a hot-water heating apparatus embodying this invention. Fig. 2 is a plan view of the same. Fig. 3 is a plan view of a section on line 3 3. Fig. 4 is a side elevation of Fig. 1, partly in section. Fig. 5 is a side view partly in section. Fig. 6 is a perspective view representing the fire-pot and water-jacket.

In the drawings, A represents the fire-pot casing, B an outer jacket which surrounds the same, and C the fuel-grate. Between the casings A and B is a chamber, H, for holding water. The jacket is formed to surround the fire-pot, as shown in Fig. 7. The water chamber extends entirely round the fire-pot and over the top thereof.

E represents an outer casing entirely surrounding the water-jacket and arranged so that a space exists between the outer surface of the water-jacket and the inner surface of said casing. This space is divided by vertical plates *a* into separate channel-spaces *e*, as represented in Fig. 6 of the drawings. Said channels communicate at their top ends with apertures *f*, which apertures extend through the water-jacket to the fire-pot, so that the heat and products of combustion may pass outward from the fire-pot and downward through the channels *e* to the bottom of the water-jacket and through the ash-chamber to the smoke-pipe P, as indicated in Fig. 6. The apertures *f* are preferably made in size so that their aggregate size will about equal the aperture in the smoke-pipe P, to the end that the heat and products of combustion will pass through all the apertures *f*, simultaneously and be equally distributed around the water-jacket and compelled to travel down through the channels *e* along the entire length of the water-jacket.

In the outer casing, E, are apertures *q* above the channels *e*, covered by suitable plates, *r*, to the end that a rod may be introduced into the apertures from above for the purpose of cleaning the channels, and through the base-plate M are corresponding apertures, *n*, through which the soot removed by said rod may pass to the ash-chamber. The apertures *n* are covered by a movable damper, N, (see Fig. 3,) and when standing open the heat and products of combustion also pass through these apertures from the channel *e* to the ash-chamber and smoke-pipe, as shown in Fig. 6. In some cases I have found it desirable to close the apertures *n* and carry the products of combustion to the smoke-pipe by a shorter path. To this end I provide a damper, S, (see Fig. 6,) and allow communication between the channels *e* at their lower ends, whereby the products of combustion may be abruptly turned and carried through the damper S whenever occasion requires.

In the outer casing, E, is a door, *h*, with which coincides an opening, *k*, extending through the water-jacket for the introduction of fuel into the fire-pot, and in the rear wall of the jacket is a damper, *m*, arranged to be opened when the fuel-door is opened to prevent the escape of smoke and gases into the apartment. Said damper may be closed at other times to cause the products of combustion to pass through the openings *f* and down the channels *e*, as before described.

s represents the pipe through which water enters the lower portion of the water-jacket, and *t* represents the pipe through which the heated water passes from the jacket to the radiating-coils.

I claim—

1. A hot-water-heating apparatus having a fire-pot and hot-water jacket surrounding the same, and a series of independent channels extending through the water-jacket and down the outside thereof for conducting heat and products of combustion out of the fire-pot and down the outer surface of the water-jacket to the ash-chamber and smoke-pipe, substantially as described.

2. In a hot-water-heating apparatus, the combination of a fire-pot, A, a water-jacket, B, having apertures *f*, the outside casing, E, and the plates *a*, arranged to form channels *e*, com-

municating at one end with the aperture *f* and at the opposite end with the ash-chamber and smoke-pipe, substantially as described.

3. In a hot-water-heating apparatus, the combination of the fire-pot, the water-jacket surrounding the same, the apertures *f* therein, the plates *a*, the channels *e* between the plates, the outer casing, E, the draft-openings *n* in the plate M, and movable dampers N for covering the same, substantially as described.

4. In a hot-water-heating apparatus, the combination of a fire-pot, the water-jacket surrounding the same, having apertures *f*, the outer casing, E, and the plates *a*, arranged to form the channels *e*, said casing E being provided with apertures above the channels *e* for the introduction of a cleaning-rod and corresponding apertures in the plate M at the bottom of said channels for the exit of soot, substantially as described.

Signed at Lynn, Massachusetts, this 5th day of August, 1887, in the presence of two witnesses.

OSCAR W. NOBLE.

Witnesses:
E. E. HAMILL,
C. B. TUTTLE.