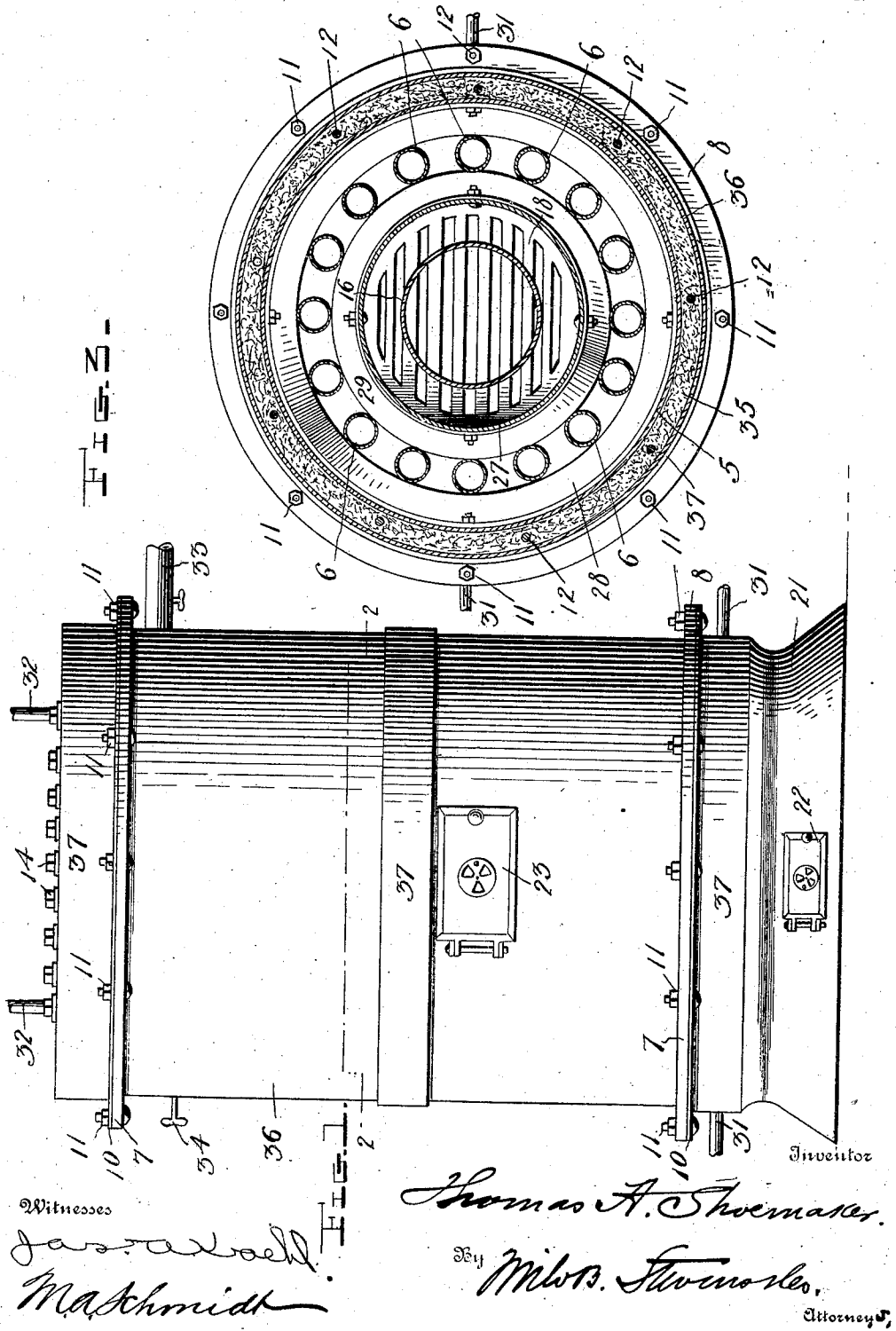


No. 851,183.

PATENTED APR. 23, 1907.

T. A. SHOEMAKER.
WATER HEATER.
APPLICATION FILED NOV. 19, 1906.

28 SHEETS—SHEET 1.



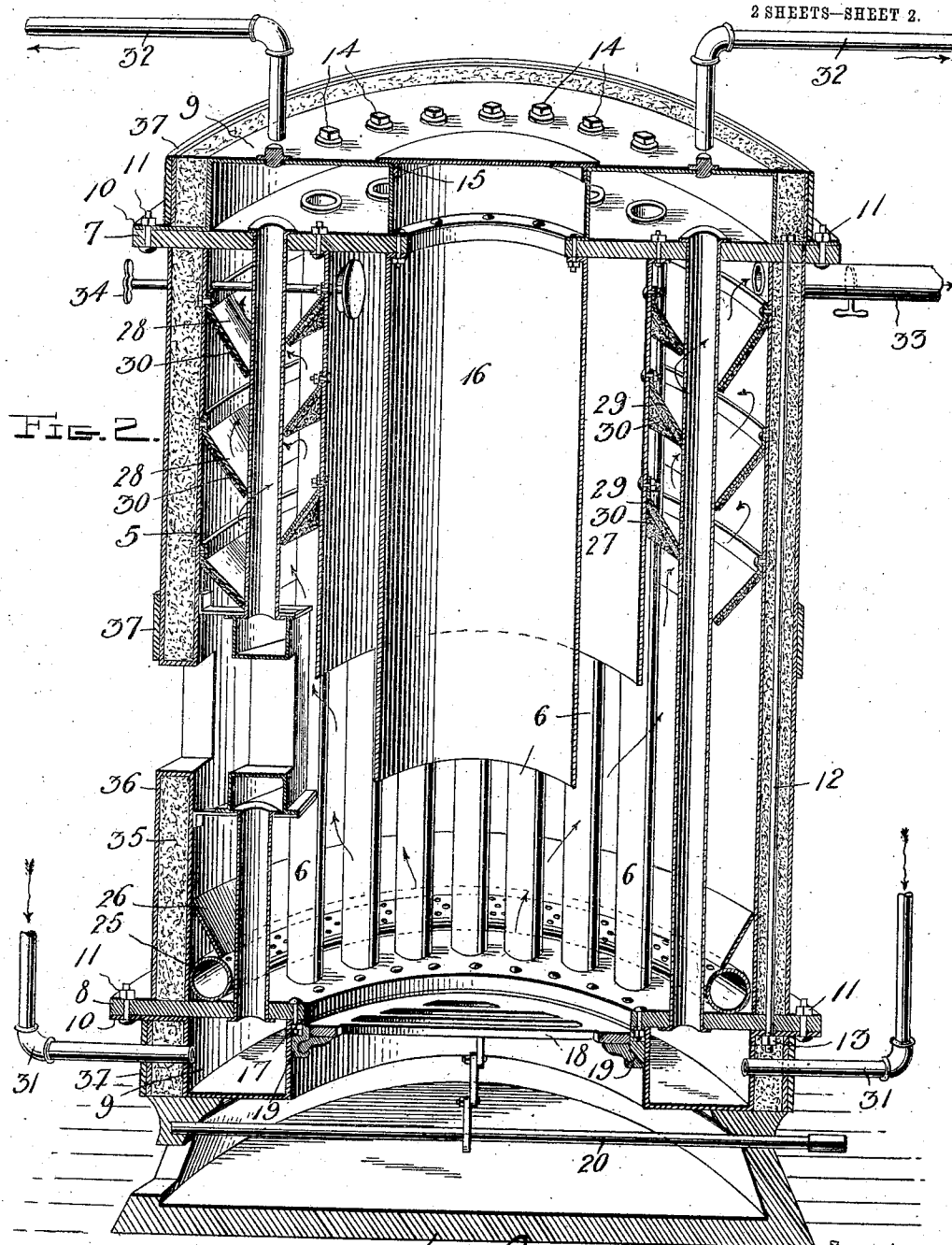
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WATER HEATER.

APPLICATION FILED NOV. 19, 1906.

2 SHEETS—SHEET 2.



Witnesses

Jas. A. Roach.
W. A. Schmidt

21 Thomas A. Shoemaker. Inventor

By M. B. Stearns. Attorney

UNITED STATES PATENT OFFICE.

THOMAS A. SHOEMAKER, OF DANVILLE, ILLINOIS.

WATER-HEATER.

No. 851,183.

Specification of Letters Patent.

Patented April 23, 1907.

Application filed November 19, 1906. Serial No. 344,048.

To all whom it may concern:

Be it known that I, THOMAS A. SHOEMAKER, a citizen of the United States, residing at Danville, in the county of Vermilion and State of Illinois, have invented new and useful Improvements in Water-Heaters, of which the following is a specification.

This invention is a water-heater for hot-water heating-systems, and has for its object to provide a heater embodying simplicity of construction so that it can be cheaply installed and readily kept in good order.

A further object is to provide a novel arrangement of water tubes and baffle-plates whereby the products of combustion are utilized to their fullest extent, and all heat extracted before their escape from the heater.

A further object is to provide a heater which can also be used as a steam generator.

In the accompanying drawings, Figure 1 is an elevation of the invention. Fig. 2 is a central vertical section. Fig. 3 is a horizontal section on the line 2—2 of Fig. 1.

Referring specifically to the drawings, 5 denotes a cylindrical shell which forms the casing of the heater. At the top and bottom of the shell are drums which are connected by a series of tubes 6 arranged in a circle. In larger sized heaters two or more rows of tubes will be used. The drums are formed by the top and bottom tube-sheets 7 and 8, respectively, into which the tubes are rolled, and casings 9 having flanges 10 which are bolted as at 11 to the tube-sheets. The tube-sheets extend beyond the shell 5, and on the outside thereof they are connected by rods 12 which also extend through the flanges 10. The ends of the rods are threaded to receive nuts 13 so that the tube-sheets can be tightly drawn against the shell. In the casing 9 of the top drum in line with the tubes are plugs 14. The top drum also has a central opening 15 from which a magazine 16 extends into the heater. The bottom drum has an opening 17 below which is a grate 18 supported on lugs 19 extending from the casing 9.

A suitable shaker-bar 20 is provided which is mounted in the base 21 of the heater. The base is a hollow casing which forms the ash pit of the heater.

A door 22 to the ash pit is provided.

The doorway of the fire-door 23 is water-jacketed, and the jacket is connected to the top and bottom drums by short tubes. Fuel

is fed into the heater through the fire-door, 55 but when a long fire is desired the magazine 16 will be filled.

On top of the tube-sheet 8 behind the tubes is an annular gas burner 25 to permit the use of gaseous fuel. Between the burner 60 and the shell 5 is a shield 26 to prevent ashes from lodging behind the burner.

At 27 is indicated a cylinder which is bolted to the tube-sheet 7 and extends around the magazine 16 to within a short distance 65 from its lower end. The tubes 6 extend between the shell 5 and the cylinder 27. Between the shell and the tubes are downwardly inclined baffle-plates 28 which are bolted to the shell and extend entirely around 70 the same, the lower ends of the plates being in contact with the tubes. Similar baffle-plates 29 also extend from the cylinder 27 the lower ends of said plates also extending in contact with the tubes. The plates 28 and 75 29 are staggered so that the products of combustion take a zigzag course around the tubes as indicated by arrows in Fig. 2. By this arrangement the water is rapidly heated and a saving of fuel is also had as all the heat 80 is taken from the products of combustion before they pass out of the heater. The baffle-plates are lined on their under sides with asbestos as indicated at 30, and by inclining them as shown soot, etc., is prevented from 85 lodging thereon.

The water inlets are indicated at 31, the outlets at 32, and the smoke flue at 33. At the top of the cylinder 27 is an opening controlled by a damper 34 for establishing a 90 direct draft which may be desirable when starting the fire.

The heater is covered on the outside with asbestos as indicated at 35 over which is placed a jacket 36 of sheet iron which may 95 have ornamental bands 37.

I claim:—

1. In a heater, the combination of a casing, top and bottom drums, a magazine extending through the top drum into the casing, a cylinder depending from the top drum and surrounding the magazine, and tubes extending between the casing and the cylinder, and connecting the top and bottom drums. 105

2. In a heater, the combination of a casing, top and bottom drums, a cylinder depending from the top drum, tubes connecting

the top and bottom drums and extending between the casing and the cylinder, and baffle-plates extending from the cylinder and the casing to the tubes.

- 5 3. In a heater, the combination of a casing, top and bottom drums, a cylinder depending from the top drum, tubes connecting the top and bottom drums and extending between the casing and the cylinder, and
10 staggered and downwardly inclined baffle-

plates extending from the cylinder and the casing to the tubes.

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

THOMAS A. SHOEMAKER.

Witnesses:

ELMER R. JOY,
A. McLENNAN.