

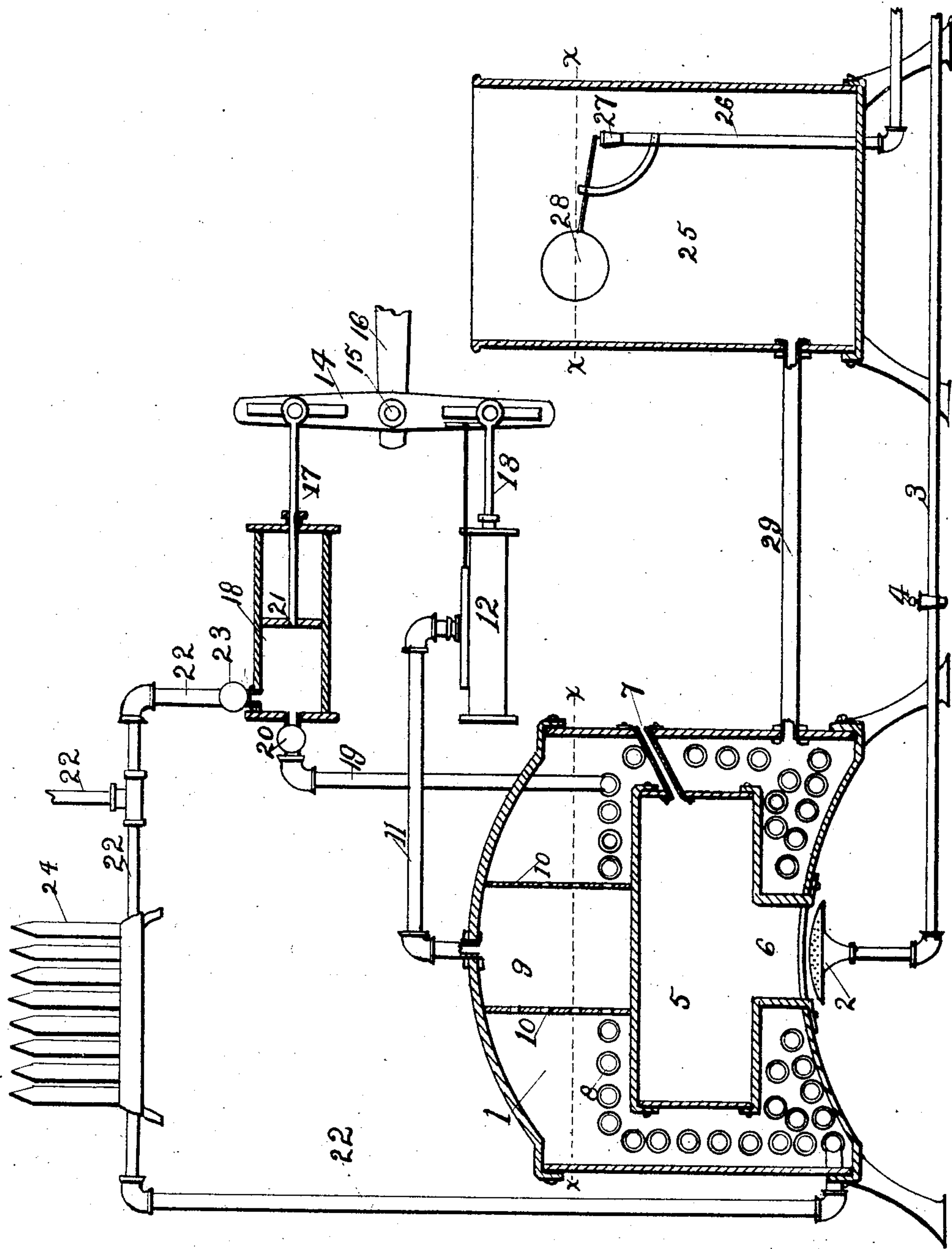
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A. H. FREERICKS.
HOT WATER HEATING APPARATUS FOR BUILDINGS.

APPLICATION FILED JULY 7, 1904.

NO MODEL.



Witnesses.

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HOT-WATER HEATING APPARATUS FOR BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 777,894, dated December 20, 1904.

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To all whom it may concern:

Be it known that I, ARTHUR H. FREERICKS, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Hot-Water Heating Apparatus for Buildings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification.

My invention relates to simple and efficient means for heating water to be passed through the heating-pipes and radiators of buildings for heating the different rooms and compartments of said buildings and whereby such heated and heating water is maintained in constant circulation through the heater and through the various pipes and radiators of the building.

The novelty of my invention will be hereinafter more fully set forth, and specifically pointed out in the claims.

In the accompanying drawing I have shown in elevation and partly in section a diagrammatic view of an apparatus embodying, and suitable for carrying out, my invention, in which—

1 is the heater or main boiler, usually located in the basement or cellar of the building and which is preferably circular with a dome-shaped top and a concave bottom, under which latter at the center is located any suitable burner, such as a gas or hydrocarbon burner 2, with a supply-pipe 3, provided with a regulating cock or valve 4. I preferably place within the boiler 1 a heating-chamber 5, which is of drum shape, with a lower leg 6 passing through the bottom of the boiler directly over the burner 2, so that the products of combustion while being distributed over the bottom of the boiler will also pass up through said leg into the drum 5 and serve to materially heat the contents of the interior of the boiler. Any number of vents 7 may extend out from the drum 5 through the shell of the boiler to carry off the waste products of combustion.

Within the boiler 1 are coils of pipe 8 in continuous series, filling up the lower space of the boiler below the water-level, which is indicated by the dotted lines *xx*, and I pre-

fer to place directly over the center of the drum 5 a tubular chamber 9, with perforations 10 in its sides, which will permit the water therein to receive the more direct heat of the fuel and to boil quicker than the water in the other parts of the boiler. The steam is taken from the top of this chamber 9 through a pipe 11 to any suitable slide-valve engine 12, whose piston-rod 13 actuates a vibrating cross-head 14, pivoted, as at 15, to a stationary bracket-arm 16, and whose opposite end actuates the piston-rod 17 of a pump-barrel 18, receiving at one end the pipe 19 from the uppermost row of the coil of pipes 8 within the boiler 1, and which pipe 19 has in it a check-valve 20 to prevent backflow of the water on the back stroke of the piston 21 within the barrel 18. A second pipe 22 extends from the barrel 18 at the end of the same, into which the pipe 19 enters and is provided with a check-valve 23 to prevent backflow into the barrel. The pipe 22 is the beginning of the system of pipes which extends throughout the building and have connected to them at the proper points required the heating-radiators, of which one is shown at 24. After leaving the last radiator in the system the pipe 22 descends and is connected to the lowest coil of pipes 8, as indicated.

Any convenient and well-known means may be employed for keeping the boiler supplied with water, and in this instance I have shown a tank 25, receiving a constant supply of water through a pipe 26, which has at its upper end a check-valve 27, controlled by a float 28, constructed in a usual and well-known manner, and the lower ends of the tank 25 and the boiler 1 are connected by a pipe 29, so that the level of the water in the tank 25 (indicated by the dotted lines *xx*) is always maintained in the boiler. In this simple and efficient manner I am enabled at a very low cost of fuel to keep up a constant supply of hot water and at the same time generate sufficient steam to operate an engine which shall cause a continuous circulation of water heated in the boiler in a separate coil of pipes through the various pipes and radiators of the building and back again to the boiler to be reheated.

The system of piping 22 may be supplied with water from any source in any of the well-known ways, and while I have shown a light portable furnace with a hydrocarbon-burner 5 it is to be understood that my invention is not to be limited to these details, for the furnace may be of any description desired and bricked in and provided with a grate for burning solid fuel.

10 Having thus fully described my invention, I claim—

1. In hot-water heating apparatus, and in combination, a steam-boiler, containing water at a constant level, means for heating the wa- 15 ter in said boiler, an engine connected by a pipe to the steam-space of said boiler, a coil of pipe within the water-space of the boiler, one end of which has communication with a pump and the other end of which has commu- 20 nication with the entire system of piping in the building including the radiators, said pipe system extending to the said pump, piston-rods connected to the pistons in said pump and engine and having their projecting ends 25 connected to a pivoted cross-arm, whereby the reciprocation of the engine piston-rod is imparted in an opposite direction to the pump piston-rod, the arrangement being such that a constant flow of hot water is maintained

through the system of pipes and radiators and 30 the coil of pipes in the boiler, substantially as described.

2. In hot-water heating apparatus, and in combination, a steam-boiler containing water at a constant level, means for heating the wa- 35 ter in said boiler, an engine connected by a pipe to the steam-space of said boiler, a chamber within the boiler to receive the products of combustion with vents from said chamber leading out of the boiler, a coil of pipe within 40 the water-space of the boiler, one end of which has communication with the entire system of piping in the building including the radiators, said pipe system extending to said pump, piston-rods connected to the pistons in said pump 45 and engine and having their projecting ends connected to a pivoted cross-arm, whereby the reciprocation of the engine piston-rod is imparted in an opposite direction to the pump piston-rod, the arrangement being such that 50 a constant flow of hot water is maintained through the system of pipes and radiators and the coil of pipes in the boiler, substantially as described.

ARTHUR H. FREERICKS.

Witnesses:

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EDWARD SUSSDORF.