

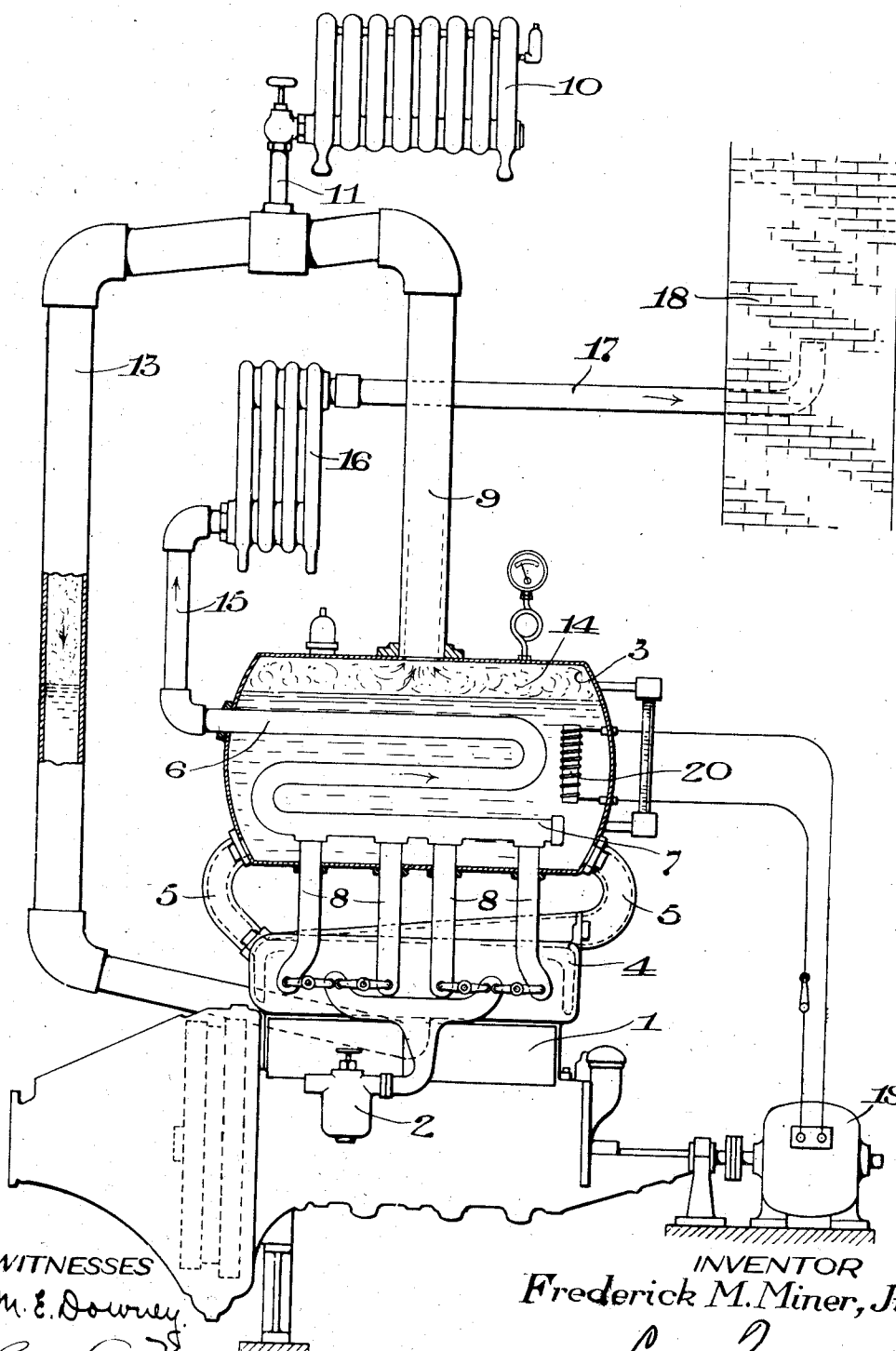
April 8, 1924.

1,489,501

F. M. MINER, JR

HOUSE HEATING SYSTEM

Filed Jan. 16, 1922



WITNESSES

M. E. Downey

C. L. Naal

INVENTOR

Frederick M. Miner, Jr.

Louis Leibel
ATTORNEY

UNITED STATES PATENT OFFICE.

FREDERICK M. MINER, JR., OF MADISON, WISCONSIN, ASSIGNOR TO MADISON HEATING COMPANY, A CORPORATION OF WISCONSIN.

HOUSE-HEATING SYSTEM.

Application filed January 16, 1922. Serial No. 529,420.

To all whom it may concern:

Be it known that I, FREDERICK M. MINER, Jr., a citizen of the United States, residing at Madison, county of Dane, and State of Wisconsin, have invented certain new and useful Improvements in House-Heating Systems, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The invention relates to heating systems. In the usual oil-burning heating systems, combustion is carried out at atmospheric pressure or slightly above such pressure. Such systems do not give as high a heat return as may be obtained by generating the heat at relatively high pressures. It is the object of this invention to generate the heat at high pressure by consuming the fuel in an explosive or constant pressure internal combustion engine in which the heat from the cylinders and the exhaust is utilized to produce hot water or steam for a house heating system, and in this way it is possible to utilize almost the entire heat output of the engine. Furthermore, when it is desired to run the engine forming the combustion apparatus under load it may be coupled to a generator which furnishes its current to an electrical heating coil in the boiler forming a part of the system.

With the above and other objects in view, the invention consists in the apparatus hereinafter described and all equivalents.

The drawing shows an elevation view partly in section of an apparatus embodying the invention.

In the drawings the numeral 1 designates an internal combustion engine. While the engine shown is of the explosive type, using a carburetor 2, an oil engine or gas engine may also be used in this system.

A boiler 3 is connected to the jacket space 4 of the engine 1 by pipes 5 which also act as supports for the boiler. A heating coil or other suitable system of piping is mounted in the boiler and its lower section 7 is connected by pipes 8 to the exhaust passages leading from each of the cylinders of the engine, there being four cylinders in the engine shown. The pipes 8, as well as the pipes 5 and the other piping in the system, are preferably provided with suitable heat-insulating coverings to reduce radiation losses. The arrangement of separate pipes from the exhaust of each cylinder prevents

back pressure interfering with the proper operation of the engine.

A riser pipe 9 leads from the boiler 3 and a radiator 10 is connected to said pipe by a pipe 11, and a wet return pipe 13 leads to the lower portion of the water jacket space of the engine. I have shown a steam heating arrangement in which the pipe 9 leads from the top of the boiler to conduct the steam 14 formed therein to the radiator 10, but hot water may be used as the heat conveying medium, if desired. Other radiators may also be connected up with the pipes 9 and 13, as will be readily understood by those skilled in this art.

With this construction the operation of the engine heats up the water in the jacket space, which is in direct communication with the water in the boiler 3, so that the heat conducted through the cylinder walls of the engine is used for heating the water, and as the exhaust gases from the engine discharge into the coil in the boiler the greater proportion of the heat of the exhaust gases is used to heat the water in the boiler.

The remaining available heat in the exhaust gases, with the exception of a very small amount, is recovered by passing the exhaust gases from the coil 6 through a pipe 15 to a radiator 16 and thence through a pipe 17 to the chimney 18, which provides a good draft to carry away the spent exhaust gases. This radiator 16 imparts its heat to the air in the room in which it may be located by direct radiation.

In some instances where the engine is directly connected to a generator 19, as in a farm lighting plant, or where such generator or other power consuming device is provided for putting a load on the engine, the current from the generator may be conducted through a circuit including an electrically heated resistance element 20 located in the boiler.

The system may be started by turning the engine over by hand or by starting systems now used on automotive vehicles.

I desire it to be understood that this invention is not to be limited to any specific form or arrangement of parts except in so far as such limitations are specified in the claims.

What I claim as my invention is:

1. In a heating system, the combination of a boiler, a radiator, and piping connect-

ing said radiator with the boiler, an internal combustion engine having its jacket space communicating with the boiler, an exhaust-heated radiator, and means for conducting the exhaust from said engine through the boiler and then through said last named radiator.

2. In a heating system, the combination of a boiler, an internal combustion engine, means for conducting the exhaust from said engine through the boiler, a generator driven by the engine, and a current-consuming heating element in circuit with the generator and disposed within the boiler.

3. A heating plant comprising a water-cooled multicylinder internal combustion engine, a boiler in circuit with the jacket space of the engine, an exhaust pipe having a coil disposed within the boiler, and separate exhaust pipes from the engine cylinders passing into the boiler to conduct the exhaust gases to said coil.

4. A heating plant comprising a liquid-cooled multicylinder internal combustion engine, a boiler, piping supporting the boiler above the engine and establishing communi-

cation between the boiler and the jacket space of the engine, an exhaust pipe having a coil disposed within the boiler, and separate exhaust pipes from the engine cylinders passing into the boiler to conduct the exhaust gases to the coil.

5. In a heating system, the combination of a boiler, an internal combustion engine, means for conducting the exhaust from said engine through the boiler, a power-consuming device driven by the engine, and means for converting the energy of said device into heat energy supplied to the boiler.

6. In a heating system, the combination of a boiler, an internal combustion engine having its jacket space communicating with the boiler, means for conducting the exhaust from said engine through the boiler, a power-consuming device driven by the engine and means for converting the energy of said device into heat energy supplied to the boiler whereby the entire output of the engine and the heat of the exhaust and jacket is utilized to supply heat energy to the boiler.

FREDERICK M. MINER, JR.