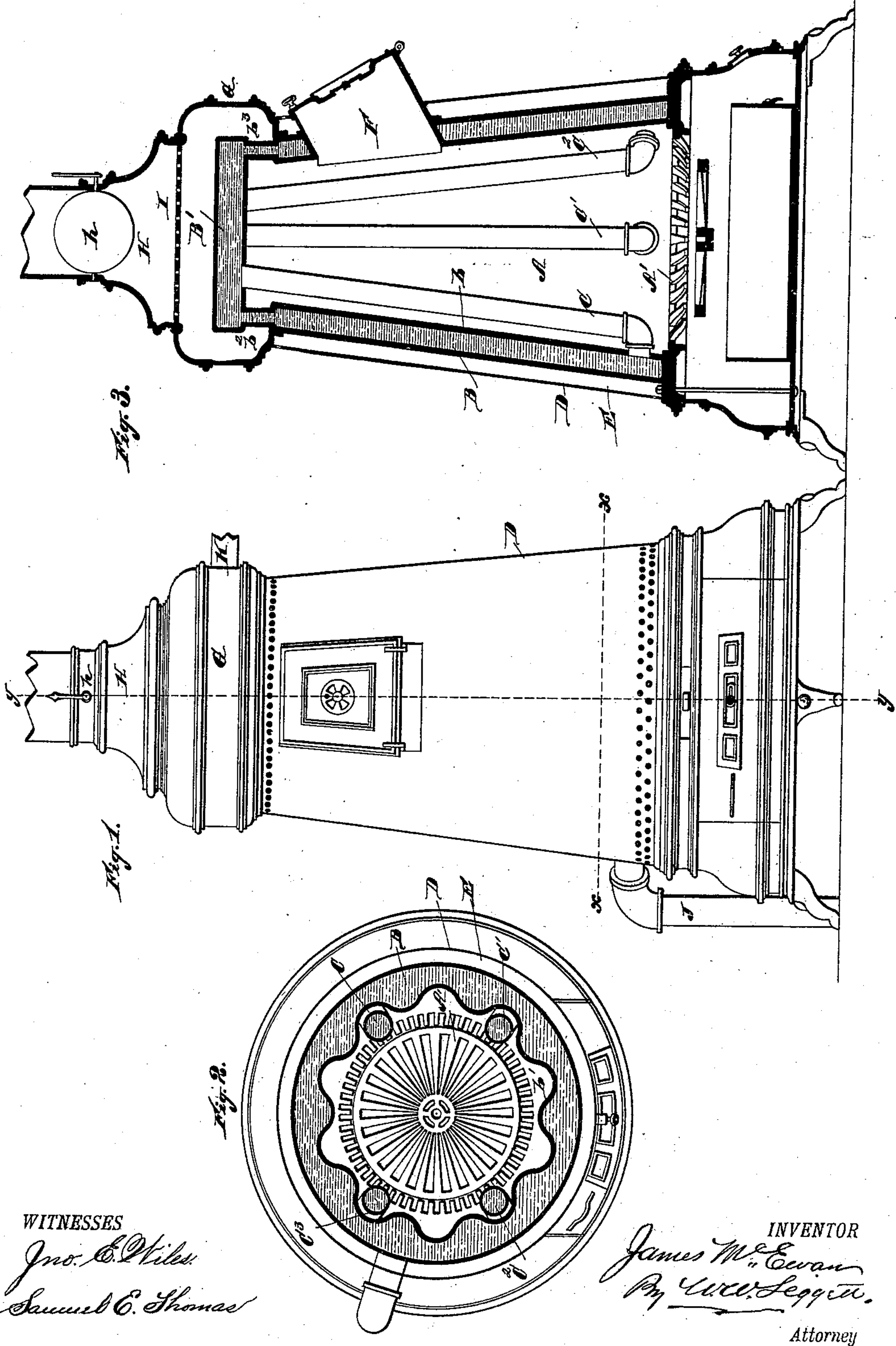


(No Model.)

J. McEWAN.
STEAM BOILER.

No. 326,440.

Patented Sept. 15, 1885.



WITNESSES
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JAMES McEWAN, OF DETROIT, MICHIGAN, ASSIGNOR TO ELIZABETH L.
McEWAN, OF SAME PLACE.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 326,440, dated September 15, 1885.

Application filed June 27, 1885. (No model.)

To all whom it may concern:

Be it known that I, JAMES McEWAN, a subject of the Queen of Great Britain, residing at Detroit, county of Wayne, State of Michigan, have invented a new and useful Improvement in Hot-Water or Steam Boilers; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to water heaters and circulators, and has for its object the novel combination and arrangement of devices and appliances whereby an improved water heater and circulator shall be effected for various purposes—such as heating buildings, cars, &c.—to which it might be applicable, the object of the invention being more especially to provide such a heater and circulator in which the heat derived therefrom may be maintained with the greatest economy and efficiency.

I carry out my invention as follows:

In the drawings, Figure 1 is a side elevation; Fig. 2, a horizontal section along the line X X. Fig. 3 is a vertical section along the line Y Y.

A is a combustion-chamber; A', the grate. B is a water-jacket surrounding the combustion-chamber, said jacket communicating at the top with a water-chamber, B', located directly above and over the combustion-chamber, so as to receive the influence of the heat in the most direct manner as the heat rises in the combustion-chamber, and thereby to utilize its power in heating the water in said chamber with the least possible expenditure of fuel. The inner casing, b, of this water-jacket I prefer to construct of corrugated metal, as a much larger area of surface may be thereby presented to and brought into contact with the combustion-chamber. This corrugated surface gives a greater heating capacity to the water-jacket. I do not limit myself to this construction.

C C' C², &c., represent water-pipes arranged in the combustion-chamber, and communicating at their base with the water-jacket and at the top either with the chamber B' or with the upper portion of the water-jacket B. These

pipes provide additional surface for heating the water, and also facilitating circulation. I do not limit myself to any precise number of these water-pipes, but would have it understood that any desired number may be used without departing from the principle of my invention. Should the corrugated inner casing of the water-jacket be employed, these pipes may conveniently be arranged in the cavities of said case.

D represents the outer shell of the heater, forming an air-space, E, between it and the water-jacket, to prevent undue radiation of heat.

F is the chute through which fuel is fed to the combustion-chamber. The chamber B' communicates with the water-jacket through a series of pipes or connections, b² b³, &c.

Surrounding the water-chamber B' is a drum, G, communicating with the combustion-chamber, permitting the products of combustion to circulate freely around upon all sides of said chamber.

H is a smoke-flue chamber provided with a damper, h. I prefer, also, to locate at the top of the drum a metallic screen, I, which may serve as a spark-arrester, and which in case of accident, should the device be used upon a railway, for instance, would be serviceable in preventing the escape of fuel from the combustion-chamber.

J is an inlet-pipe; K, an outlet-pipe. These pipes connect with the coils of pipes which may be led through the building or car for heating purposes.

The operation of the device is as follows: Water admitted to the water-jacket surrounding the combustion-chamber through the inlet-pipe is heated by the products of combustion coming in contact with the interior of said jacket and with the pipes C C' C², &c., the water-chamber B' facilitating the heating and the circulation, the products of combustion passing forward through the drum and the smoke-flue.

The device is simple and economical.

By this means the circulation of water may be maintained at a high temperature and without undue expenditure or waste of fuel, as all the heat is economized in the most thorough manner.

It is evident that the device may also be used as a steam-heater, in which case the chamber B' would become a steam-dome, the water being allowed to rise to about the top 5 of the jacket, the dome acting as a super-heater; and I would have it understood that I contemplate its use in this manner. The outer case may also be dispensed with, and the water-jacket be bricked in when desired. 10 Should the case be employed, it may be suitably perforated, as shown in the drawings, to admit air. It is noticeable that a large fuel-chamber is provided for distribution.

What I claim is—

15 1. The combination of the combustion-chamber A, the water-jacket B, surrounding the same, the separate chamber B' over the combustion-chamber, the tubes b^3 , connecting the separate chamber B' with said water-jacket, 20 the outside casing, D, the drum G, made separate from said casing D and inclosing chamber B', and communicating with the combustion-chamber, and the water-tubes connecting the lower portion of the water-jacket with 25 chamber B', substantially as and for the purposes described.

2. The combination of combustion-chamber A, water-jacket B, surrounding the same, the inner wall of said jacket being corrugated, the chamber B' over the combustion-chamber, 30 and the tubes C, lying in the corrugations of the jacket and connecting the lower portion of the jacket with chamber B', substantially as and for the purposes described.

3. The combination of combustion-chamber A, water-jacket B, surrounding the same, 35 chamber B' over the combustion-chamber, and communicating with said jacket, tubes C, connecting the water-jacket and chamber B', drum G, inclosing chamber B' and communicating with the combustion-chamber, and 40 screen I in said drum above chamber B', substantially as and for the purposes described.

In testimony whereof I sign this specification in the presence of two witnesses.

JAMES MCEWAN.

Witnesses:

N. S. WRIGHT,

M. B. O'DOHERTY.