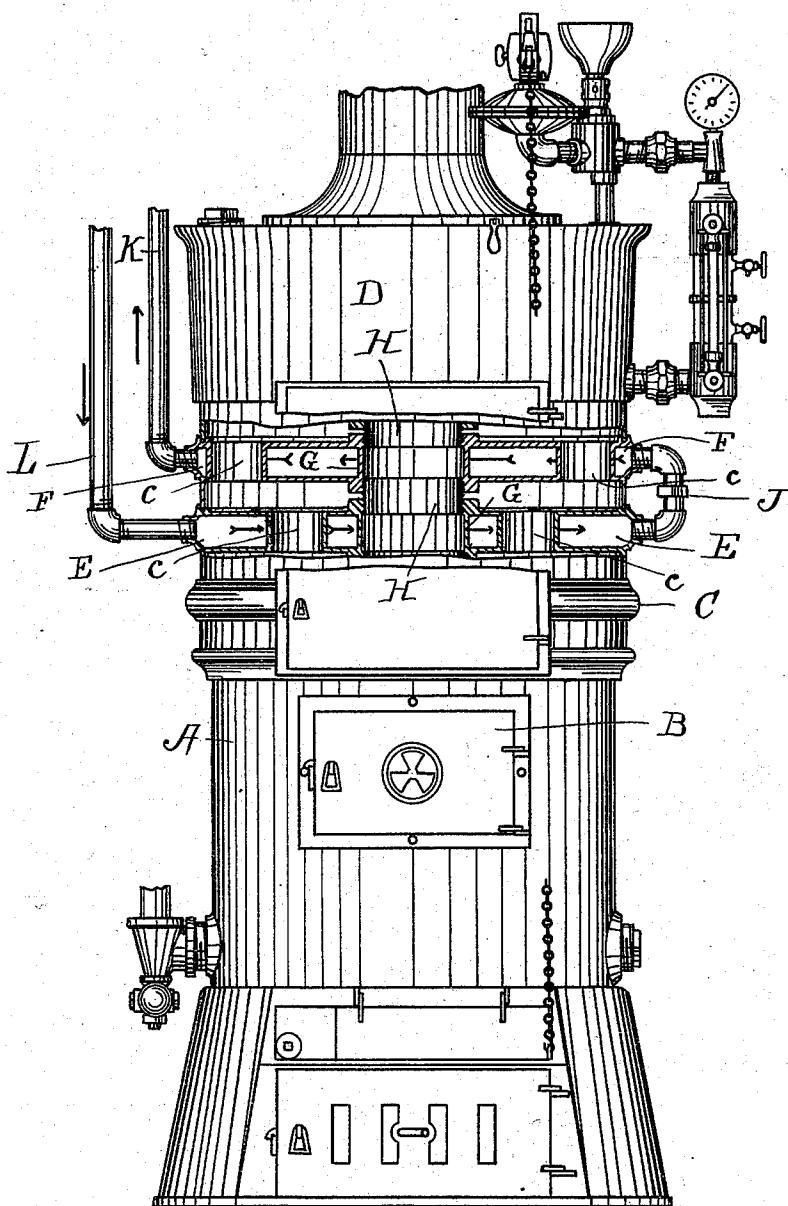


(No Model.)

N. E. FROST.
HEATING APPARATUS.

No. 558,017.

Patented Apr. 7, 1896.



WITNESSES.

Matthew M. Blunt.
B. L. Makepeace.

INVENTOR.

Newland B. Frost.
by N. H. French.
ATT'Y

UNITED STATES PATENT OFFICE.

NEWLAND E. FROST, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE SMITH & THAYER COMPANY, OF MAINE.

HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 558,017, dated April 7, 1896.

Application filed September 21, 1895. Serial No. 563,192. (No model.)

To all whom it may concern:

Be it known that I, NEWLAND E. FROST, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Heating Apparatus, of which the following, taken in connection with the accompanying drawing, is a specification.

The object of this invention is to provide a combined steam and hot-water heating apparatus in one and the same structure, or, in other words, to incorporate in a steam heating apparatus devices for heating also by hot-water circulation.

My invention is embodied in a steam-heater having between its fire-pot and steam-dome a series of broad hollow water-containing disks, with smoke-flues or caloric-passages through them, and a central connection and continuous water-passage upwardly through all the disks, two of them being isolated from the steam system by internal tubular partitions and connected to each other marginally by a tubular coupling at one edge and by flow and return pipes at the opposite edge for continuous water-circulation through said isolated disks and to and from the radiators in rooms to be heated. By my improved system and apparatus water for steam-making rises centrally from the top of the fire-pot through all the hollow disks and through the tubular central partitions of those isolated, as stated, to the steam-dome at the top of the series, becoming sufficiently heated meanwhile by its circulation and exposure in the other disks and in the dome, the steam being carried thence as usual. At the same time and heated by the same fire the water contained in two of the disks is entirely cut off from the steam system, but circulates for hot-water heating through the annular interiors of said disks and their coupling, flow and return pipes, independently of the steam heating-disks.

The drawing is an elevation of a heater constructed according to my invention, the disks isolated for hot-water circulation being shown in section to represent their construction and relation to the other parts.

A is the body of the heater, and B the fuel-door leading into the fire-pot.

C represents one of the flat disks for steam-making, connected by an enlarged central nipple with the hollow water-containing top of the fire-pot, and D is the steam-drum at the top of the heater. The top of the fire-pot, each of the disks, and the steam-drum has a series of vertical openings *c* through it for the passage of the caloric-current.

Between the fire-pot and the steam-drum, and centrally connected with both, I introduce two flat annular disks E F, having similar flue-openings *c*, and each disk having centrally a tubular partition or circular wall G uniting the upper and lower surfaces and fixed permanently in place surrounding the opening into the connecting-nipple H. These nipples and circular walls or partitions constitute a continuous waterway upwardly through the disks E and F, preventing the water which is rising from the fire-pot wall to the steam-dome D from traversing the broad interior of disks E F, and thus isolating their annular bodies from the steam-heating system.

The two disks E F are marginally connected to each other by a union-coupling J, permitting the water in disk E to rise into and circulate through the disk or hollow annular section F, and also by flow-pipe K running from disk F to a radiator in the room to be heated, and by return-pipe L from such radiator to disk E, so as to give repeated circulation to the same water independent of the water and steam in the other parts of the heater.

I claim as my invention—

1. The described steam heating apparatus, having water-containing sections centrally connected and successively exposed to the rising caloric-current in combination with a hot-water-circulation device, comprising two of such sections having annular bodies isolated from the steam system, coupled marginally, and connected together by flow and return pipes, substantially as set forth.

2. In a combined steam and hot-water

heater, the annular sections E F formed with
the central tubular partition G, in combina-
tion with the coupling J uniting them tubu-
larly at one edge and with the flow and return
5 pipes K L connecting them at the other edge
for continuous circulation, substantially as
set forth.

In testimony whereof I have signed my

name to this specification, in the presence of
two subscribing witnesses, on this 27th day of 10
June, A. D. 1895.

NEWLAND E. FROST.

Witnesses:

G. S. KING,

H. MELLEFONTE.