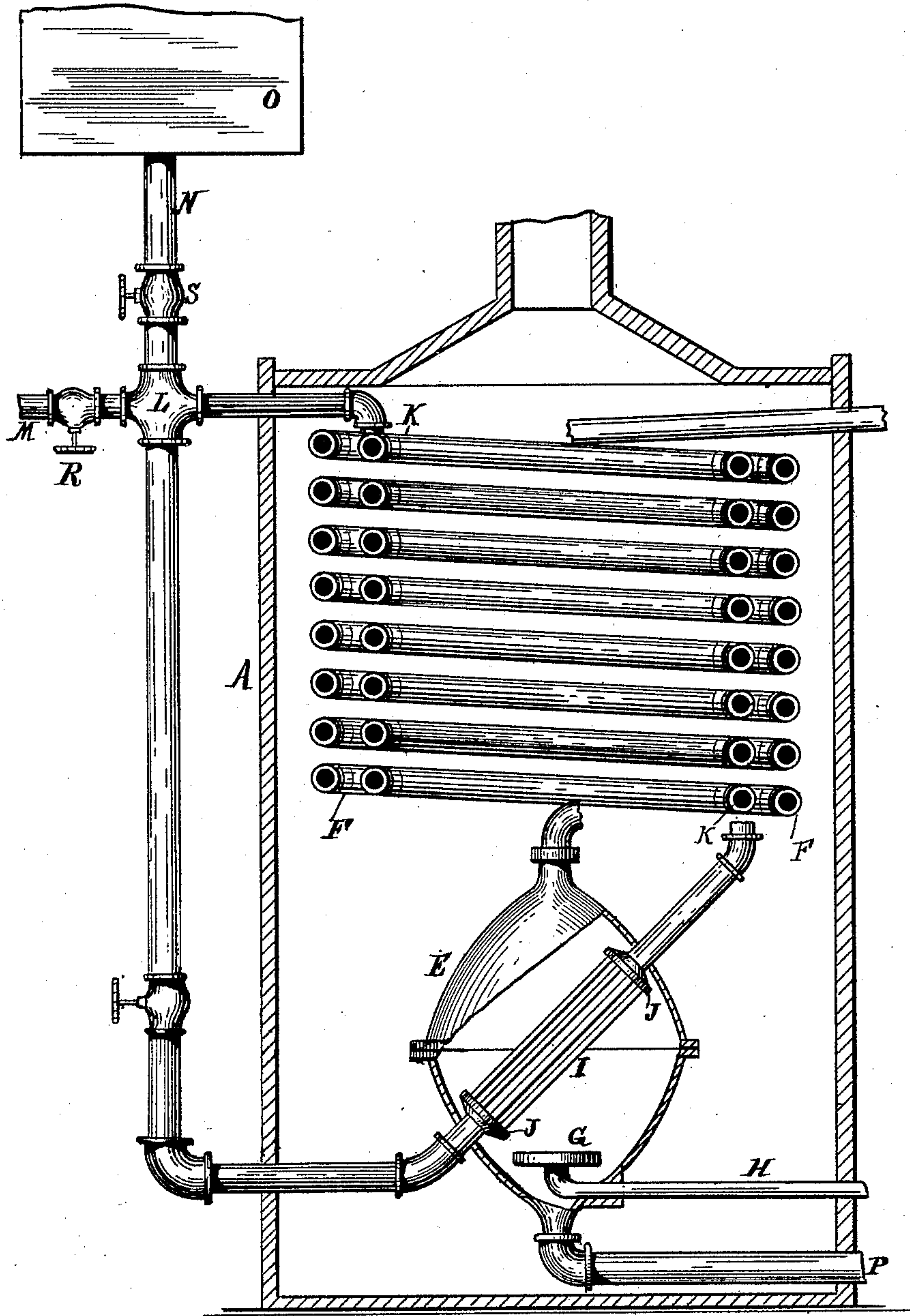


(No Model.)

C. E. MARK.
HEATING APPARATUS.

No. 434,936.

Patented Aug. 26, 1890.



Attest:

W. H. Patton

Chas. R. Dunbar

Inventor
Charlie E. Mark

By *A. J. Hargreaves*

Atty.

UNITED STATES PATENT OFFICE.

CHARLIE E. MARK, OF CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO RUSSELL BOTTSFORD, OF SAME PLACE.

HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 434,936, dated August 26, 1890.

Application filed February 4, 1888. Serial No. 263,013. (No model.)

To all whom it may concern:

Be it known that I, CHARLIE E. MARK, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Heating Apparatus, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to certain new and useful improvements in hot-water-circulating heaters; and the invention consists in the peculiar construction and arrangement of the parts whereby the device is adapted to heat apartments and in the peculiar construction, arrangement, and combinations of the various parts, all as more fully hereinafter set forth, and specifically pointed out in the claims.

In the accompanying drawing, which forms a part of this specification, my invention is shown in vertical section and partially in elevation, and wherein—

A represents a cylindrical heater shell or drum.

E represents a stove of substantially the form shown, and this stove is surmounted by a coil of pipe F, through which the products of combustion find escape to the chimney. Within this stove is secured a gas-burner G, of any suitable construction, and which is provided with a pipe H, through which gas is admitted to said burner.

P is a pipe that conducts atmospheric air to the base of the stove below the burner.

I represents a nest of small pipes connected at their inner ends to the manifolds J. These pipes I preferably arrange diagonally across the path of the flame of the burner G and entirely within the stove. The upper manifold is connected to a coil of pipe K, inclosed within the coil F, such coil K forming part of a system of hot-water-circulating pipes the return of which is to and through the lower manifold.

In the drawing I have represented this system as connected to a four-way coupling L, the supply-pipe M being designed to be connected to a water-supply and the stand-pipe N to an expansion-chamber O, both pipes M and N being provided with suitable valves R S, respectively. If it is convenient to connect to a public water-supply, as in cities, by means of the pipe M, then the expansion-chamber

may be dispensed with or its valve S closed. In this case the expansion takes place against the head or force of the water-supply. Where this cannot be done, the valve R is closed and the valve S opened and connected with the expansion-chamber, in which has been placed the desired quantity of water, and in which the expansion takes place, as is well known and applied in various systems of hot-water circulation.

While I have shown the circulation as established substantially through the heater alone, it is evident that the piping may be extended, so as to provide for the heating of one or more rooms or compartments, without departing from the spirit of my invention.

One or more nests of pipes I may be employed, if desired, each being connected to the system of circulating-pipes, and I consider it clearly within the spirit of my invention should such nests of pipe be constructed in the form of coils or other changes made whereby the water to be heated would be conducted through a plurality of small passages for the purpose of enabling the heating agent to the more quickly create a circulation through the system.

I am aware of the state of the art as disclosed in the patents to Fairbairn, January 1, 1884, Brown, July 24, 1860, Denslow, April 19, 1887, Bell, September 11, 1866, Muller, March 1, 1870, Root, August 5, 1873, and Caldwell, March 15, 1887, of record in this case, and make no claim to the constructions shown in said patents.

I am also aware that various other styles of horizontal, vertical, and inclined tubular boilers have been invented and patented; but in all of those constructions of which I have any knowledge the tubes or flues have been constructed as forming integral parts of the boilers and have not been separable therefrom, as shown in my present application, and they have all necessarily been connected with a boiler of greater or lesser capacity. In my invention the construction of the manifold, consisting of the heads and communicating series or plurality of pipes with the system of circulating-pipes, is a complete structure independent of the heater or furnace.

What I claim as my invention is—

1. In a heating apparatus, the combination
of an outer drum, a combustion-chamber,
a coiled flue or pipe for the products of com-
bustion within said drum, heating-pipes
5 within the combustion-chamber, and a coil of
circulating water-pipes communicating with
the heating-pipes arranged within the coiled
flue in the drum, substantially as described.

2. In a heating apparatus of the character
10 described, the combination of an outer drum,
a combustion-chamber, coiled flue or pipe
for the products of combustion, a nest of pipes
arranged diagonally across and within the

combustion-chamber, and a coil of circulating
water-pipes communicating with the nest of 15
pipes in the combustion-chamber and ar-
ranged within the coiled flue, substantially as
described.

In testimony whereof I affix my signature,
in presence of two witnesses, this 2d day of 20
February, 1888.

CHARLIE E. MARK.

Witnesses:

W. H. PATTON,

CHAS. R. DUNBAR.