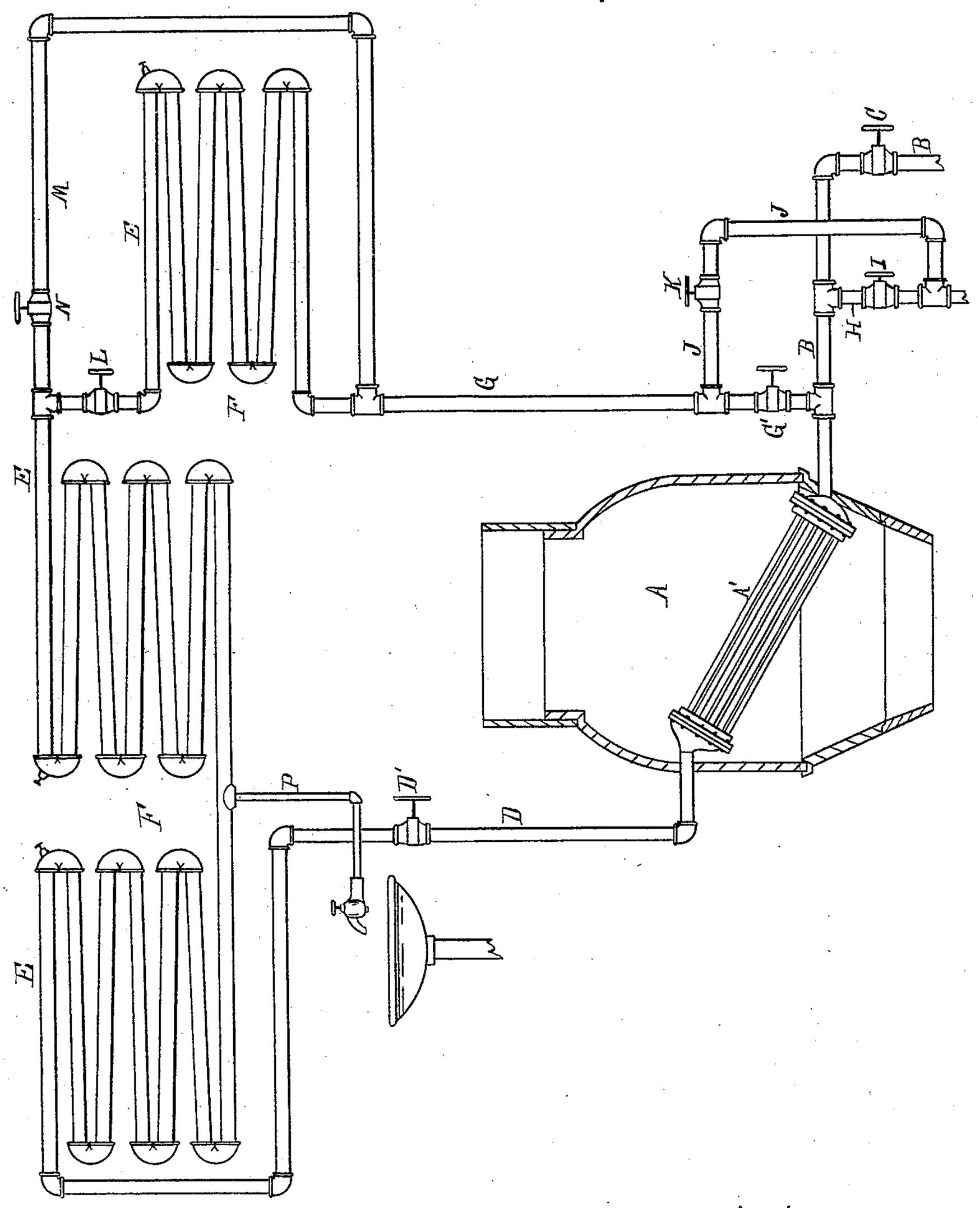
(No Model.)

R. BOTTSFORD.

SYSTEM OF HOT WATER CIRCULATION.

No. 452,505. Patented May 19, 1891.



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UNITED STATES PATENT OFFICE.

RUSSELL BOTTSFORD, OF CLEVELAND, OHIO.

SYSTEM OF HOT-WATER CIRCULATION.

SPECIFICATION forming part of Letters Patent No. 452,505, dated May 19, 1891.

Application filed May 17, 1890. Serial No. 352,168. (No model.)

To all whom it may concern:

Be it known that I, RUSSELL BOTTSFORD, 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 Systems of Hot-Water Circulation, of which the following, with the accompanying drawing, is a specification.

The invention relates to certain new and useful improvements in hot-water circulation for heating purposes.

The invention has for its object an improved system of piping for the purpose of heating houses, rooms, &c., through the medium of circulating hot water, whereby is insured a continuous hoop-circuit of the water from the point of its issuance from the heater to the point of return thereto, thus establishing what I term a continuous "hoop-circuit," which can be carried through various rooms or apartments upon the same or different floors. By this system I avoid the necessity of carrying risers and returns to the different rooms or apartments to be heated, and hence I materially lessen the cost of piping. I also provide means in the present system for emptying the pipes, and when the system is connected to a "water-supply system," as in cities, water may be drawn from the heating-pipes at various points for use in stationary basins and the bath without detracting from the efficacy of the system as a means of heating.

This system is especially designed for use in connection with a heater for which Letters Patent were issued to me January 21, 1890, and numbered 419,817, though the same is applicable to any heater for hot-water circulation.

The invention consists in the peculiar arrangement or system of piping, in combination with any suitable heater, all as more fully hereinafter described, and pointed out in the claims.

In the drawing is shown a diagram illustrating my system of piping, particularly defining the arrangement and connections between the supply or feed pipe, the return-pipe, and the waste-pipe. It also shows the arrangement of piping when it is desired to admit of the "cutting out" of one or more radiators, carrying the circulation of water around such radiator, and still preserve the hoop-circuit.

A represents a heater, which is provided with a multiple manifold located within said heater and adapted to conduct the water to be heated into close proximity to the heating agent and to be connected to the system of piping through which the circulation is carried on.

B represents the water-supply pipe, one end of which in cities is connected to the city water-supply, the opposite end of such pipe B being connected to the manifold. This pipe B is provided with a valve C.

D represents the riser-pipe of the system, which is connected to the upper end of the manifold, as shown. This pipe D is provided with a valve D′. The riser connects with the system of piping E and radiators F, forming a continuous or hoop circuit from the riser D to the return-pipe G, which in turn connects with the supply-pipe B, as shown, and it is also provided with a valve G′.

H is a waste-pipe that connects the supply-pipe B with the sewer, and this waste-pipe is provided with a valve I.

J represents a shunt-pipe connecting the return-pipe G with the waste-pipe H, communication with the latter being outside of the valve I, and this pipe J is also provided with a valve K.

The system of piping being connected substantially as described, the valve I in the waste-pipe and the valve K in the shunt-pipe J are closed, and the valve C in the feed-pipe B and the valve G′ in the return-pipe G are opened. This allows the water to flow into the system of piping under the force of the city pressure. To provide a means for the escape of air in advance of the entering water, I slightly open the petcocks or valves in the radiators, which allows the air to be forced out and thus fill the pipe without leaving air-cushions.

When it is desired to provide for the cutting out of a radiator from the system, I provide the supply-pipe of such radiator with a valve L and connect one end of a pipe M to such supply-pipe above said valve, its opposite end being connected to the system below the radiator, as shown, and this pipe M is also

provided with a valve N. By closing the valve L and opening the valve N the water is permitted to pass through the pipe around the radiator and not through it, and hence there will be no heat radiated into the apartment containing such radiator other than that thrown off by the single pipe M. By opening the valve L and closing the valve N the circulation will be carried on through the radiator.

It will be readily seen that by closing the valve C in the feed-pipe B, the valve G′ in the return-pipe G, and the valve K in the shunt-pipe J and opening the valve I in the waste-pipe H and the valve B′ in the riser-pipe D I am able to draw the water from the system down through the manifold and thus flush the same. Again, by closing the valve C in the pipe B, the valve D′ in the pipe D, and the valve G′ in the pipe G and opening the valve K in the shunt-pipe J the water in the system may be drawn off in the opposite direction, discharging through the waste-pipe.

By closing the valve D′ in the pipe D, the valve G′ in the pipe G, and the valve K in the shunt-pipe J, and also the valve C in the feed-pipe B, and opening the valve I in the waste-pipe H the water can be retained in the system of piping above the said valves D′ and G′ and K and be drawn off below them for the purpose of repairs to the manifold or heater, should it become necessary.

In a practical use of the system herein described I have found that the shunt-pipe J very materially aids in creating a circulation, particularly when starting up or filling the system, as it enables me to shunt the return water to the waste around the point of intersection between the return and the supply-pipe, while without the shunt-pipe the establishment of the circulation is very slow, inasmuch as it must be established against the force of the supply.

What I claim as my invention is—

1. In combination, in a hot-water heating apparatus, a water-heater, a primary system of water-circulating pipes provided with suitable radiators, a discharge-pipe communicating with the supply-pipe outside of the point of intersection between said supply-pipe and the return-pipe of the system, a shunt-pipe communicating with said return-pipe and with said discharge-pipe, a valve in said return-pipe between the supply-pipe and said shunt-pipe, a valve in the waste-pipe between the supply-pipe and the point of intersection between said shunt-pipe and said waste-pipe, and a valve in said shunt-pipe, the parts being constructed, arranged, and operating substantially in the manner and for the purposes herein described.

2. In a hot-water heating apparatus, the combination of a stove A, a manifold A′, located within the combustion-chamber of said stove, a primary system of piping E, terminating in a return-pipe G, which communicates with a supply-pipe B, a shunt-pipe J, communicating with said return-pipe G and with a waste-pipe H, which latter communicates with the supply-pipe B, a valve G′, located in said return-pipe G between the supply-pipe B and the shunt-pipe J, a valve I, located in the waste-pipe H between the supply-pipe B and the point of intersection of said shunt-pipe J with the said waste-pipe H, a valve K in said shunt-pipe, and a valve C in said supply-pipe B, located outside the point of intersection between said supply-pipe B and said waste-pipe H, when constructed, arranged, and operating substantially in the manner and for the purposes set forth.

In testimony whereof I affix my signature, in presence of two witnesses, this 29th day of January, 1890.

RUSSELL BOTTSFORD.

Witnesses:
H. S. SPRAGUE,
O. L. BAKER.