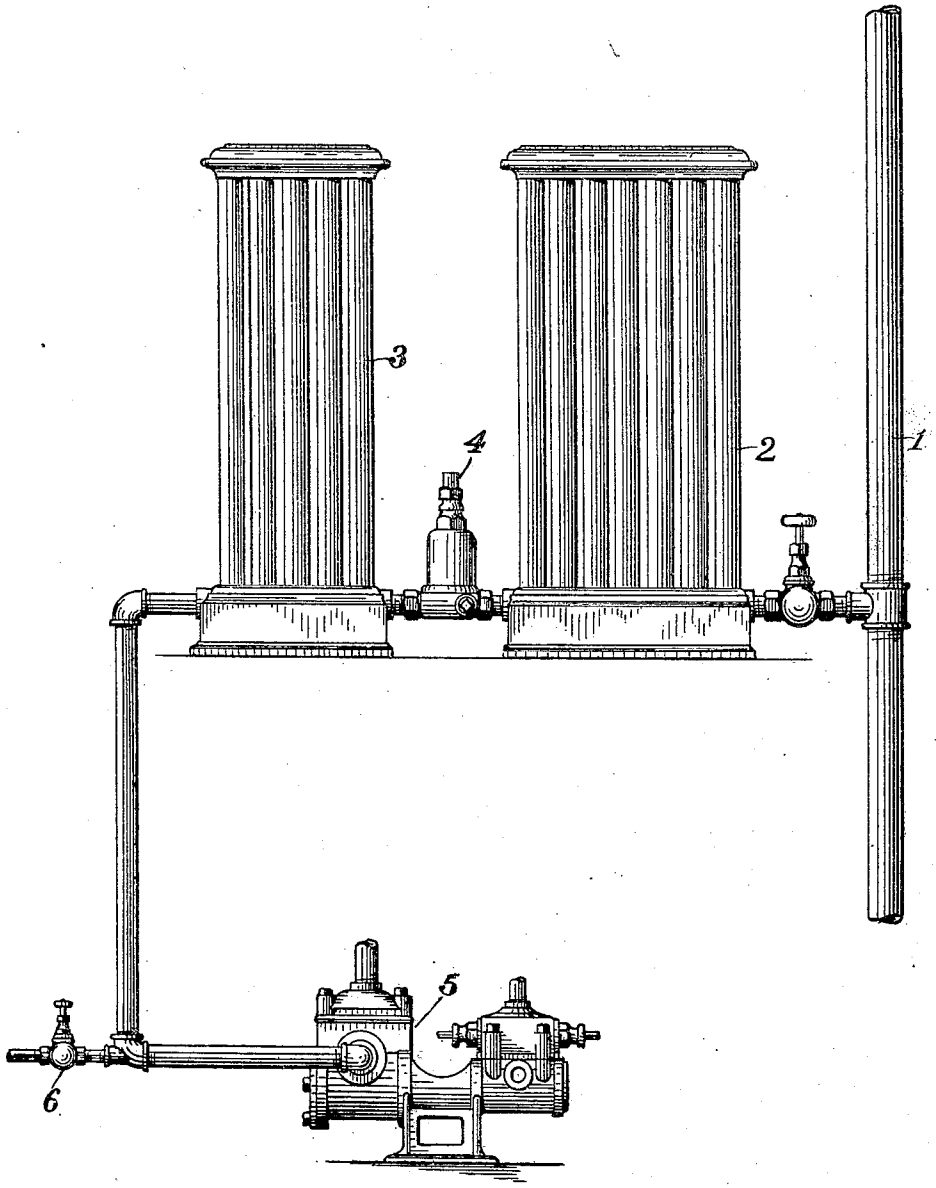
No. 860,700. PATENTED JULY 23, 1907.

F. A. SIMONDS.

METHOD OF HEATING.

APPLICATION FILED APR. 29, 1904. RENEWED DEC. 14, 1905.



Witnesses
Georgiana Chace
Edward R. Monroe.

Inventor
Frank A. Simonds
By Luther V. Moulton
Attorney

THE NORRIS PETERS CO., WASHINGTON, D. C

UNITED STATES PATENT OFFICE.

FRANK A. SIMONDS, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO SIMONDS HEATING AND SPECIALTY COMPANY, OF FREMONT, MICHIGAN, A CORPORATION OF MICHIGAN.

METHOD OF HEATING.

No. 860,700. Specification of Letters Patent. Patented July 23, 1907.

Application filed April 29, 1904, Serial No. 205,567. Renewed December 14, 1905. Serial No. 291,730.

To all whom it may concern:

Be it known that I, FRANK A. SIMONDS, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Methods of Heating; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in methods of heating, and more particularly to a method of utilizing a fluid heating medium flowing through radiators; and its object is to provide means whereby a greater amount of heat may be extracted from the medium while passing through the radiators, the said medium preferably being steam or water: and it consists essentially of the method of first extracting the heat from the medium in a radiator under the usual pressure preferably until the same is condensed, then passing the medium thus condensed into a second radiator in which preferably a vacuum is maintained, whereby the medium is again vaporized in the second radiator, and a further abstraction of heat therefrom is thus obtained. It is obviously unnecessary to carry the reduction of heat to actual condensation of the medium, before passing the medium into the next radiator and under materially reduced pressure.

The apparatus consists of the combination and arrangement of two radiators with a steam trap or other obstruction sufficient to materially restrict the flow and lower the pressure, located therebetween, means for supplying steam under pressure to the first radiator, and means for maintaining a vacuum in the second radiator.

Referring to the accompanying drawing, 1 represents any pipe or steam line for supplying the radiators with steam under pressure; 2 represents one of a series of radiators connected thereto and supplied with steam thereby; 3 represents a supplemental radiator connected directly to each radiator 2 through a steam trap 4, which trap permits the water of condensation to pass freely from the radiator 2 into the radiator 3, and prevents any great amount of steam or pressure from passing; 5 represents means for producing a vacuum in the radiator 3, which means herein shown consists of a vacuum pump connected to the discharge side of the radiator; and 6 represents suitable means for injecting cold water into the circuit between the radiator 3 and the pump, as occasion requires. The pipe 1 is supplied with steam from any convenient source. The pump 5 may obviously be displaced by any other suitable means for producing a vacuum in the radiator 3. The water jet 6 may be dispensed with under some circumstances, and the trap 4 may consist of any suitable device for the purpose of sufficiently reducing the flow to maintain a considerable difference of pressure in the respective radiators, whereby the steam having been cooled in the first radiator to, or near to the condensing point under the higher pressure will either reëvaporate or remain vapor in the second radiator because of the materially reduced pressure therein.

The operation of my invention is as follows: Steam is admitted to the radiator 2 and heat abstracted therefrom to such an extent as to produce a cooling or condensation of the steam therein under pressure that may be carried. This water obviously retains a considerable amount of heat and the higher the pressure on the radiator 2, the greater the heat of the water will be when so cooled or condensed. This water is taken out by the trap 4, and flows into the secondary radiator 3. The pressure being removed, the water will remain vapor or revaporize and heat this second radiator giving off a further quantity of heat until it is re-condensed therein at a still lower temperature, depending upon the amount of vacuum carried upon this second radiator. The water is then discharged from this second radiator at a temperature considerably below the boiling point, having parted with more heat than would be possible in a single radiator operating under pressure, and regardless of any pressure, or temperature in the line 1, or radiator 2.

The apparatus shown is not herein claimed, but is reserved for a separate application in accordance with an office action requiring division.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent is:

1. The improved method of steam heating consisting of abstracting heat from the steam while under pressure until the steam is condensed, removing the pressure from the condensed water until the same is reëvaporated, and further abstracting heat from the reëvaporated water until again condensed.

2. The improved method of steam heating, consisting of abstracting the heat from steam in a radiator containing the steam under pressure, removing the condensed water to a second radiator, in which second radiator a vacuum is maintained, and further abstracting the heat from the medium in said second radiator.

3. The improved method of steam heating comprising abstracting a portion of the heat from the steam in a radiator containing the steam under pressure, removing the hot water so condensed to a second radiator, re-vaporizing the hot water in said second radiator by removing the pressure therefrom, and abstracting a further quantity of heat from the same until the steam is re-condensed in the second radiator.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK A. SIMONDS.

Witnesses:
LUTHER V. MOULTON,
WARREN W. ANNABLE.