

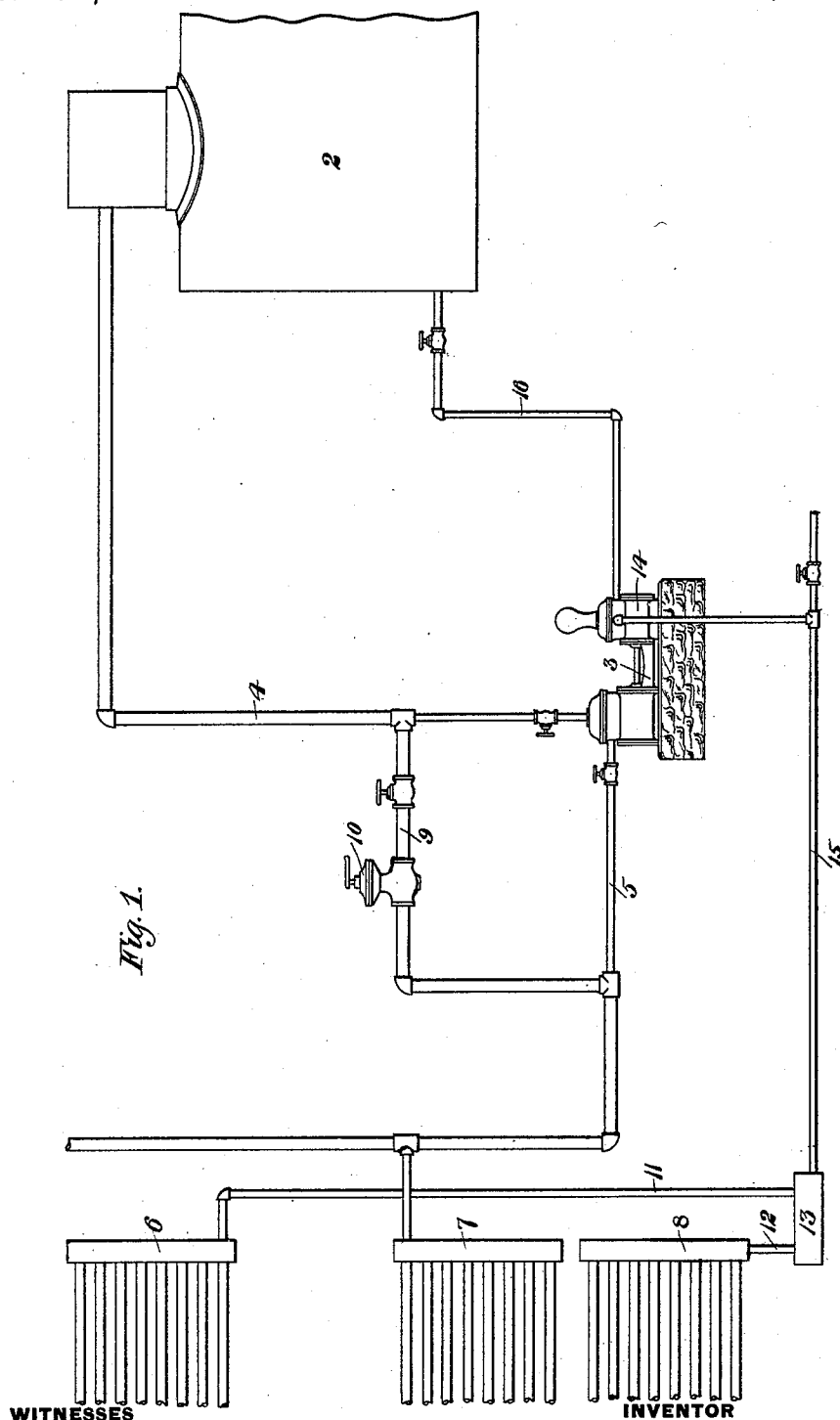
(No Model.)

2 Sheets—Sheet 1.

I. N. GORDON.
HEATING SYSTEM.

No. 499,339.

Patented June 13, 1893.



WITNESSES

INVENTOR

Warren W. Swartz
H. M. Curran

Isaac N. Gordon
by W. Baxewell & Sons
his Attorneys.

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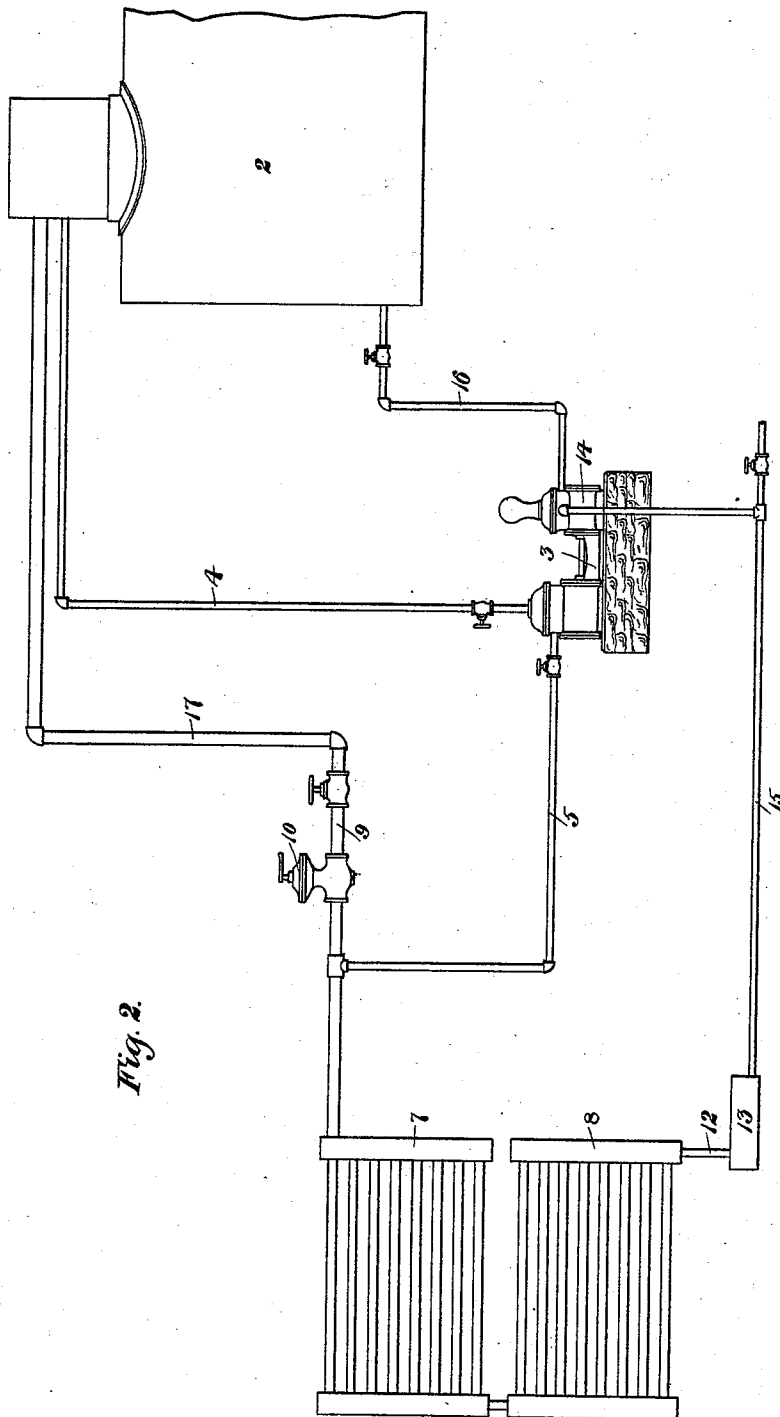


Fig. 2.

WITNESSES

Warren W. Swartz
H. M. Corwin

INVENTOR

Isaac N. Gordon
by W. B. Baxendale & Sons
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UNITED STATES PATENT OFFICE.

ISAAC N. GORDON, OF BELLEFONTE, PENNSYLVANIA.

HEATING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 499,339, dated June 13, 1893.

Application filed April 22, 1892. Serial No. 430,271. (No model.)

To all whom it may concern:

Be it known that I, ISAAC N. GORDON, of Bellefonte, in the county of Centre and State of Pennsylvania, have invented a new and useful Improvement in Heating Systems, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a diagram view illustrating my improved system; and Fig. 2 is a similar view of a modified form of the same.

My invention relates to the pumping systems employed for draining the condensed water from heating coils or radiators, and it consists principally of a boiler, a steam-pump, an exhaust pipe leading from the steam cylinder of the pump to the heating pipes or coils, a by-pass pipe also connecting the heating pipes or coils with the boiler, a return-pipe connecting the heating pipes or coils with the pump-cylinder, and a return-connection between the pump-cylinder and the boiler adapted to return to the latter the steam and water from the heating-coils.

In the drawings, in which similar numerals indicate corresponding parts, 2 indicates a boiler which is connected to the steam cylinder of a pump 3 by a valved pipe 4. From the steam-cylinder the exhaust steam passes through the pipe 5 to the heating coils 6, 7 and 8, while a branch pipe 9 directly connects the pipes 4 and 5 and leads the steam directly from the boiler to the coils, a reducing valve 10 being employed to reduce the pressure of the steam and prevent such back pressure in the pipe 5 as would stop the working of the pump. From the coils the pipes 11 and 12 lead to a receiver 13 for the saturated steam and water of condensation and this reservoir is connected with the pump-cylinder 14 of the pump by a pipe 15. A valved discharge pipe 16 leads from the pump-cylinder to the boiler and directs the steam and water back into the boiler. In the form of Fig. 2 the arrangement is substantially the same, except that a separate pipe 17 conducts the steam from the boiler to the heating coils.

The operation is as follows:—The pump being actuated by the steam passing to the steam cylinder, the exhaust steam passes therefrom to the coils through the pipe 5, together with

the steam of reduced pressure passing through the valve 10. From these coils the steam and water of condensation are drawn through the pipe 15 into the pump-cylinder, and thence forced into the boiler, and the piston in the pump-cylinder moves in unison with that in the steam-cylinder, the waste steam and water being admitted upon the same side of the pump piston as that of the live steam upon its piston. As the pump is run continuously, in practice no water accumulates in the receiver, but a constant circulation of live dry steam is induced in the coils and connecting pipes, and hence the coils heated to a much higher point than was before possible, where only the water was drained from the coils and hence saturated steam was necessarily present.

Any ordinary type of steam pump may be used, but I prefer the one in which the steam cylinder is much larger than the pump-cylinder, a proportion of two to one being usually employed, though if a high pressure in the boiler and a low pressure in the coils is desired, the proportions may be changed as desired. If the coils are of such a size that the exhaust steam is sufficient to supply them, the direct pipe from the boiler may be dispensed with.

The advantages of my system are apparent. A constant circulation of live dry steam is induced throughout the system, and there is no waste of steam, it passing through the heating coils and returning to the boiler to again receive its increment of heat. The system is simple and easily applied, and enables a much greater heat to be attained than in former systems.

Many variations may be made in the form and arrangement of the parts without departure from my invention, since

What I claim is—

1. A heating system comprising a boiler, a steam-pump, an exhaust pipe leading from the steam cylinder of the pump to the heating pipes or coils, a by-pass pipe also connecting the heating pipes or coils with the boiler, a return pipe connecting the heating pipes or coils with the pump-cylinder, and a return connection between the pump-cylinder and the boiler; substantially as and for the purposes described.

2. A heating system comprising a boiler, a
pipe connecting a steam-pump therewith, an
exhaust pipe leading from the steam-cylinder
to the heating-coils, a pipe connecting the
5 boiler with the heating coils and having a re-
ducing valve therein, a pipe connecting the
coils with the pump-cylinder, and a connec-
tion between the pump-cylinder and the boil-

er; substantially as and for the purposes de-
scribed.

In testimony whereof I have hereunto set
my hand this 12th day of April, A. D. 1892.

ISAAC N. GORDON.

Witnesses:

EDWARD CHURCH,

H. KAUFFMAN.