

No. 606,661.

Patented July 5, 1898.

J. C. HENDERSON.
HEATING OR COOLING APPARATUS.

(Application filed Aug. 4, 1897.)

(No Model.)

Fig. 1.

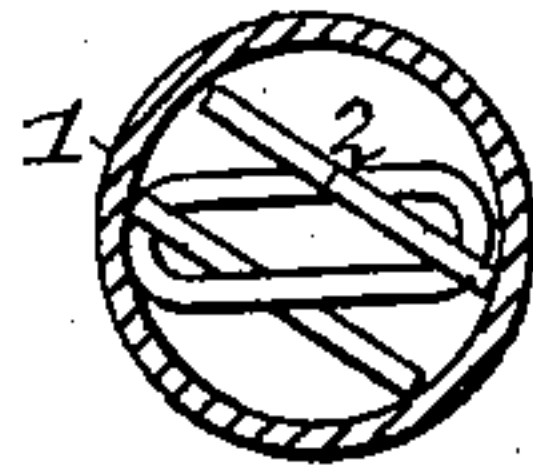
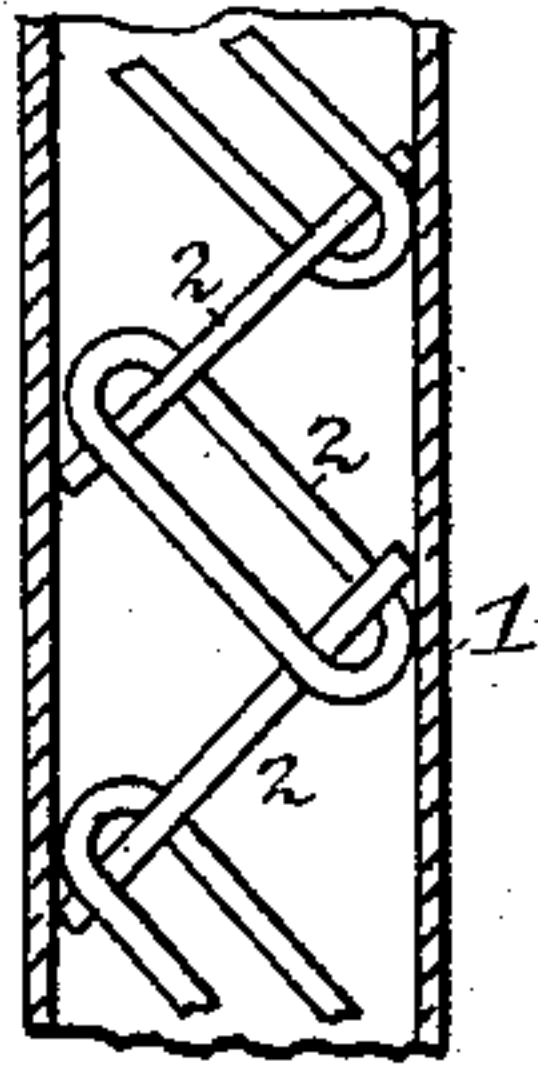


Fig. 2.

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HEATING OR COOLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 606,661, dated July 5, 1898.

Application filed August 4, 1897. Serial No. 647,122. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. HENDERSON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Heating or Cooling Apparatus; 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.

This invention relates to heating and cooling apparatus, and particularly to improvements in the same adapted to act as a heat-conductor, by means of which heat is introduced into and throughout the medium to be heated from the walls of the heating-receptacle, and also whereby the heat may be extracted from the heated medium and conducted to the walls of the receptacle, and at the same time the improvements herein described operate to break, stop, or change the direction of the flow of the medium employed.

It is well known that in heating and cooling gases each atom or molecule must individually come in contact with the heating or cooling surface, as the conductivity of gas is so slight or small as hardly to be taken into account in practice. Tubes of round section and cylinders give the least surface in comparison to their area, and therefore gases are heated and cooled much slower in tubes of this shape than in those of other shapes, and cylindrical shape tends to prevent the atoms from leaving the central zones, as the distance from and heat of the walls are equal at similar concentric points, thus creating the tendency to continue in a volume of concentric zones of differential temperature, thus requiring increased surface (by reducing the diameter and increasing the number of tubes or cylinders) and more time than necessary to effect a given amount of change in temperature. To obviate this, I introduce into tubes and cylinders, as well as receptacles of other shapes of sections, in apparatus for heating or cooling, continuous chains of any good conducting material, preferably of square, rectangular, or polysided section, loose enough to drop or come in contact with the outside walls as often as possible, and thus by con-

tact convey the heat to or from the outside walls in and through the different zones, while at the same time breaking up and distorting the line of flow, thus decreasing the amount of surface required in outside walls and the time as now employed.

With these and other objects in view the invention consists, substantially, in the construction, combination, and arrangement of parts hereinafter more fully described in the specification and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of a heating and cooling tube or cylinder provided with my improvement, and Fig. 2 is a transverse section of the same.

Similar characters of reference designate like parts throughout both views.

In the accompanying drawings I have selected a conduit or receptacle to which my improvements have been applied as an exemplification thereof; but it will be understood that I do not confine myself to the use of such conduit or receptacle, for my improvements may be applied to heating apparatus of any preferred construction.

Referring to the drawings, the reference character 1 indicates a portion of a heating and cooling conduit or receptacle within which is located, in any preferred manner, a continuous chain or number of links 2, preferably square, rectangular, or polysided in cross-section, and these links or the continuous chain are preferably constructed of any good conducting material, and this chain is adapted to contact frequently with the walls of the conduit or receptacle 1, and thereby act as a conductor or transmitter of heat to or from the walls of the conduit or receptacle within which it is located, in and through the different zones of atoms or molecules of the medium employed, and at the same time interrupting the line of flow of the medium.

It will be understood that the chain or number of links above described will break up or distort the line of flow or molecules of the medium employed and can be employed to convey a heat from the walls to the conduit or receptacle into and throughout the medium employed, or to take up or absorb the heat from the medium and convey the heat

so absorbed to the cooled walls of the conduit or receptacle when it is desired to use this apparatus for cooling the media employed.

5 The operation of my improvements will be readily understood from the foregoing description, when taken in connection with the accompanying illustration of the same, and further explanation thereof will not be required.

10 I do not desire to confine myself to the construction, combination, and arrangement of parts herein shown and described, and I therefore reserve the right to make all such changes in and modifications of the same as
15 come within the scope of my invention.

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

The combination of a conduit or receptacle with a heat-conductor situated therein, said conductor consisting of a chain formed of links of a length greater than the diameter of said conduit or receptacle, and arranged to extend from side to side thereof.

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

JOHN C. HENDERSON.

Witnesses:

C. S. ROGERS,

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