J. C. SPOTTS.

APPARATUS FOR HEATING OR COOLING FLUIDS.

APPLICATION FILED AUG. 23, 1912.

1,067,689.

Patented July 15, 1913.

3 SHEETS—SHEET 1.

Fig. 1.

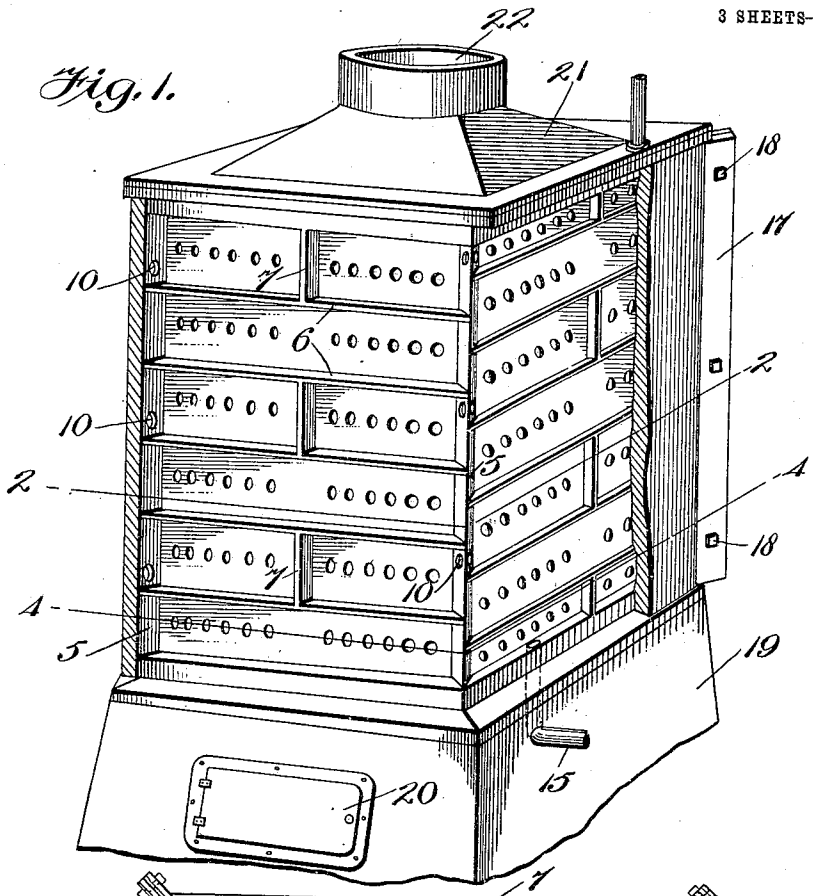
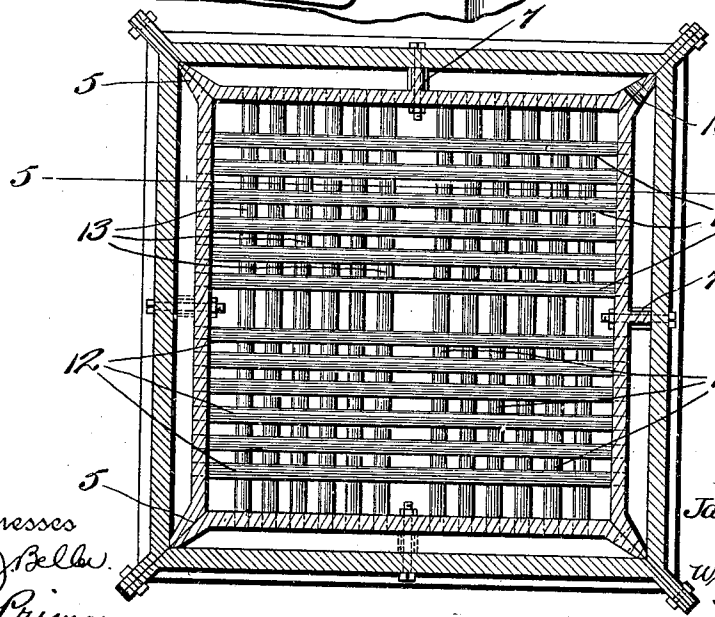


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

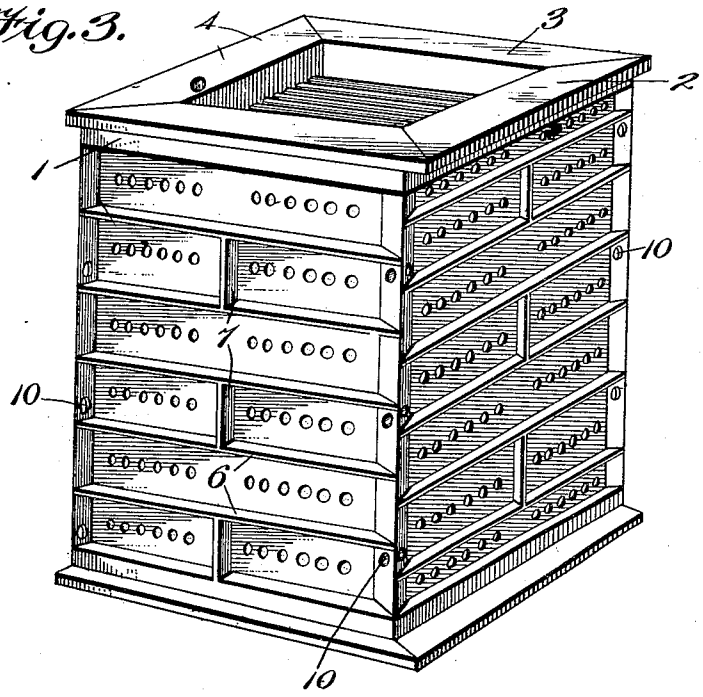
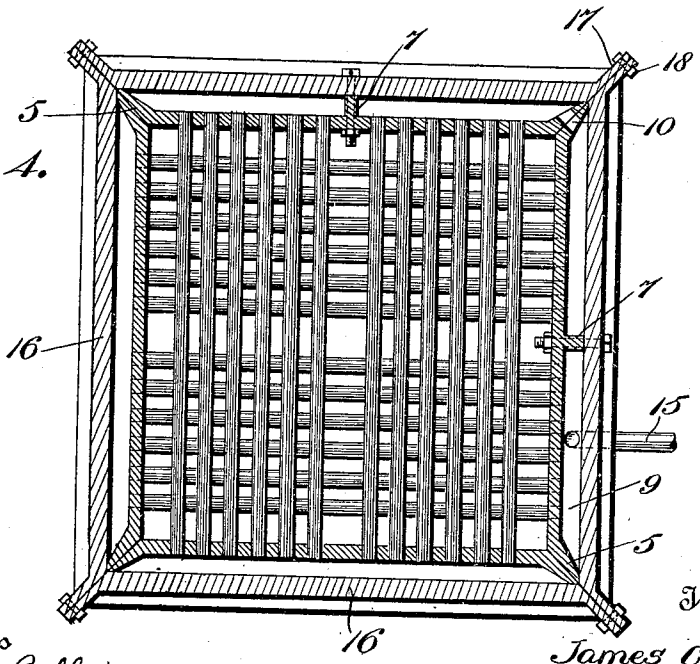


Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 5.

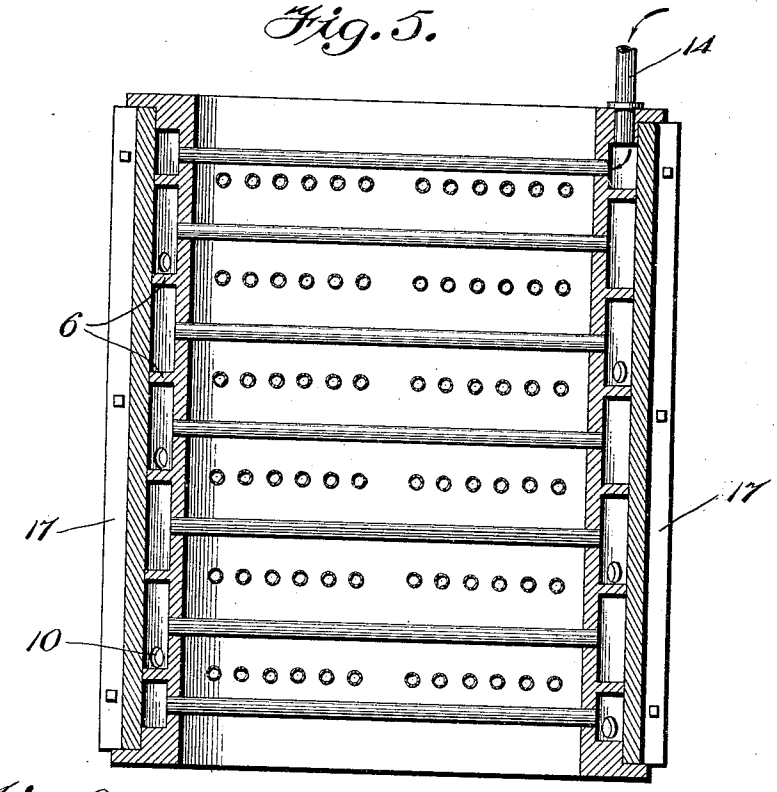
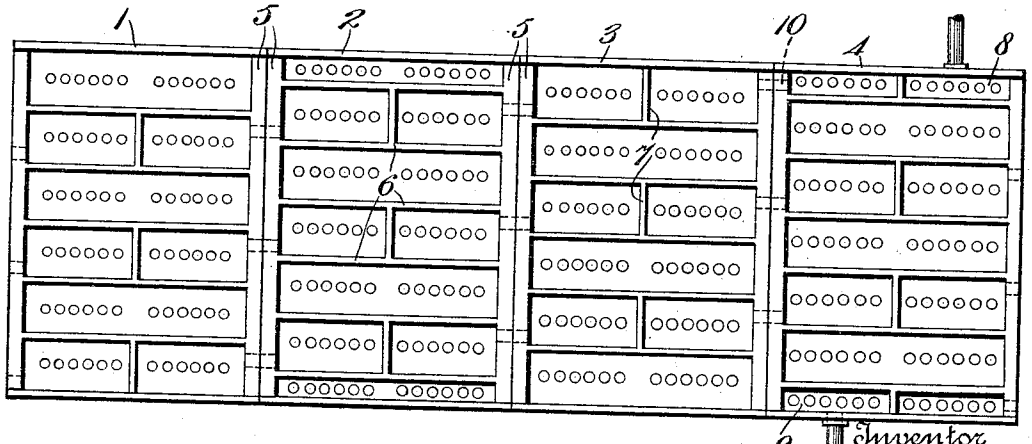


Fig. 6.



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UNITED STATES PATENT OFFICE.

JAMES CAMPBELL SPOTTS, OF NEW ORLEANS, LOUISIANA, ASSIGNOR TO CHARLES CARROLL, OF NEW ORLEANS, LOUISIANA.

APPARATUS FOR HEATING OR COOLING FLUIDS.

1,067,689. Specification of Letters Patent. **Patented July 15, 1913.**

Application filed August 23, 1912. Serial No. 716,708.

To all whom it may concern:

Be it known that I, JAMES CAMPBELL SPOTTS, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Apparatus for Heating or Cooling Fluids; 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 apparatus for heating or cooling gaseous or liquid fluids, and it consists in the constructions, combinations and arrangements herein described and claimed.

An object of my invention is to provide an improved apparatus, in which a heating or cooling medium will act efficiently on a current of fluid throughout the entire path of the latter.

A further object of my invention is to provide a compact apparatus, in which a current of fluid will be brought into contact with a maximum extent of heating or cooling surface, thereby insuring an efficient and rapid transfer of heat.

In the accompanying drawings forming a part of this application, and in which similar reference symbols indicate corresponding parts in the several views:—Figure 1 is a perspective view, illustrating one embodiment of my invention, with the outer casing partly broken away; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a perspective view of the rectangular conduit provided with exterior chambers and the connecting tubes between said chambers; Fig. 4 is a section on the line 4—4 of Fig. 1; Fig. 5 is a section on the line 5—5 of Fig. 2; and Fig. 6 is an elevation of the four walls of the rectangular conduit, showing the relative arrangement of the series of chambers in said several walls.

Referring to the drawings, 1, 2, 3 and 4 indicate the several walls of a rectangular conduit provided with end flanges and edge flanges 5 beveled to form close joints in the assembled position of said walls. Ribs 6 extend between said edge flanges 5 to provide series of external chambers extending transversely across the several walls; the alternate chambers of each series being subdivided by ribs 7 into pairs of independent compartments. As shown in the drawings, the series of transverse chambers on each wall of the rectangular conduit is arranged in alinement with the chambers of the opposite wall and in staggered relation to those of the adjacent walls; each of said compartments, with the exception of the initial inlet compartment 8 and final exhaust compartment 9, being connected by a passage 10 through the edge flanges 5 with a compartment in the adjacent conduit wall. Sets of supply tubes 12 and return tubes 13 extend across said conduit and connect the several chambers of each series with the alined compartments of the opposite series, thereby providing a continuous path through the successive chambers and compartments from an inlet conduit 14 to an outlet conduit 15. An outer casing is shown comprising four walls 16 adapted to fit closely between the end flanges of said conduit walls and provided with inclined edge flanges 17 rigidly clamped together by bolts 18; said casing walls engaging the conduit flanges 5 for firmly clamping the latter together. The conduit is shown supported on a hollow base 19, preferably formed of sheet metal, and provided with a door 20 for convenient access to a heater or other device positioned therein; the upper end of said conduit being provided with a cap 21 having an outlet 22 for the heating gases or other fluid circulating therethrough.

I have illustrated and described my device especially adapted as a superheater for steam, or similar use, but it will be obvious that any desired heating or cooling medium could be passed through the conduit for affecting the heat of a fluid circulating through the several chambers and across the tubes of said conduit.

I claim:—

1. In an apparatus of the character described, the combination of a rectangular conduit provided with series of external chambers extending transversely across its several walls, longitudinal partitions subdividing the alternate chambers of each series into pairs of independent compartments, conduits connecting the respective independent compartments of each series with those of the adjacent series, and supply and return tubes connecting alternate chambers

of the several series with a pair of independent compartments of the opposite series.

2. In an apparatus of the character described, the combination of a rectangular conduit, a series of external chambers on each wall of said rectangular conduit arranged in alinement with the chambers of the opposite wall and in staggered relation to those of the adjacent walls, longitudinal partitions subdividing the alternate chambers of each series into pairs of independent compartments, conduits connecting the respective independent compartments of each series with those of the adjacent series, and supply and return tubes connecting alternate chambers of the several series with a pair of independent compartments of the opposite series.

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

JAMES CAMPBELL SPOTTS.

Witnesses:
JOSEPH F. DUVAL,
AZZO J. PLOUGH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."