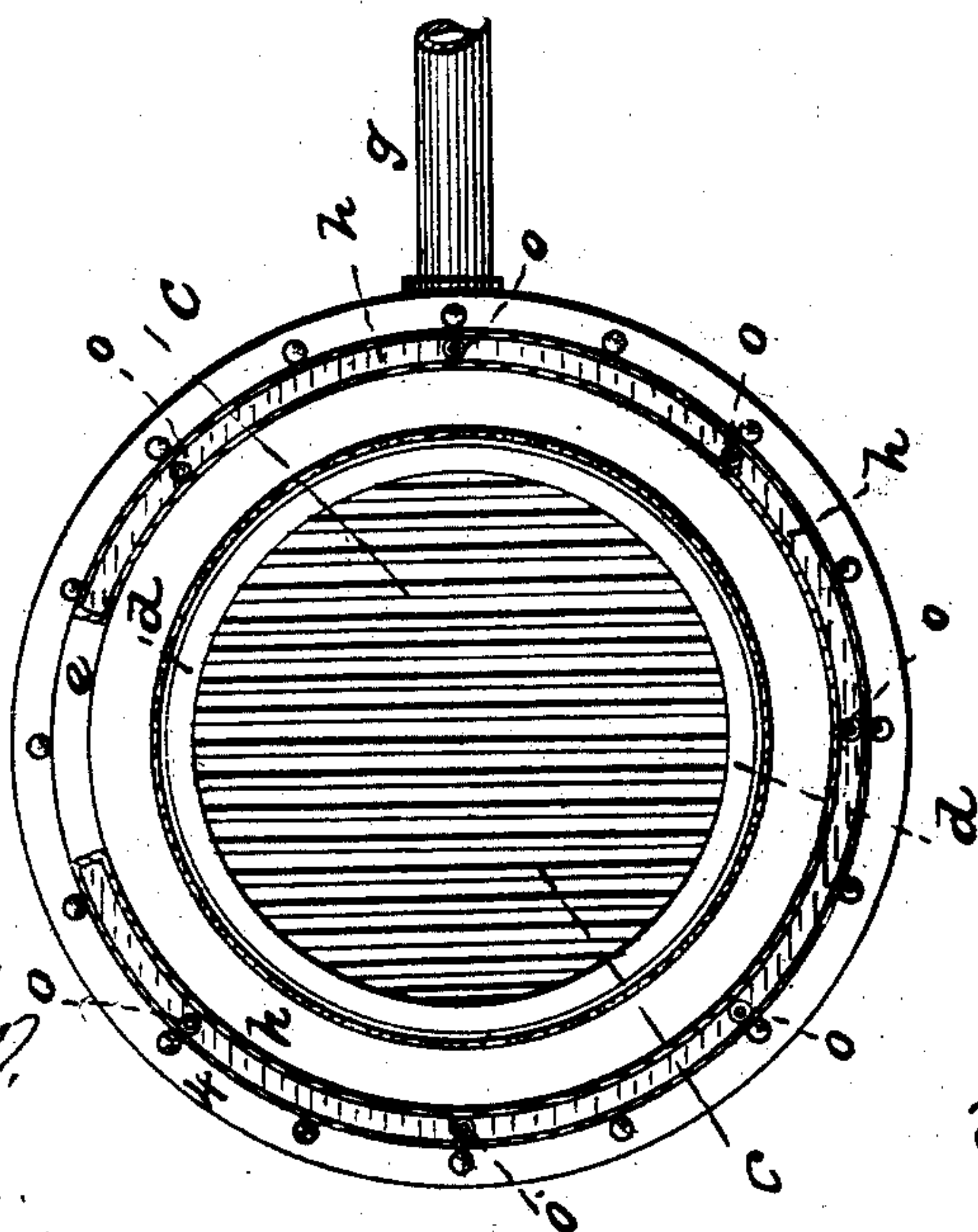
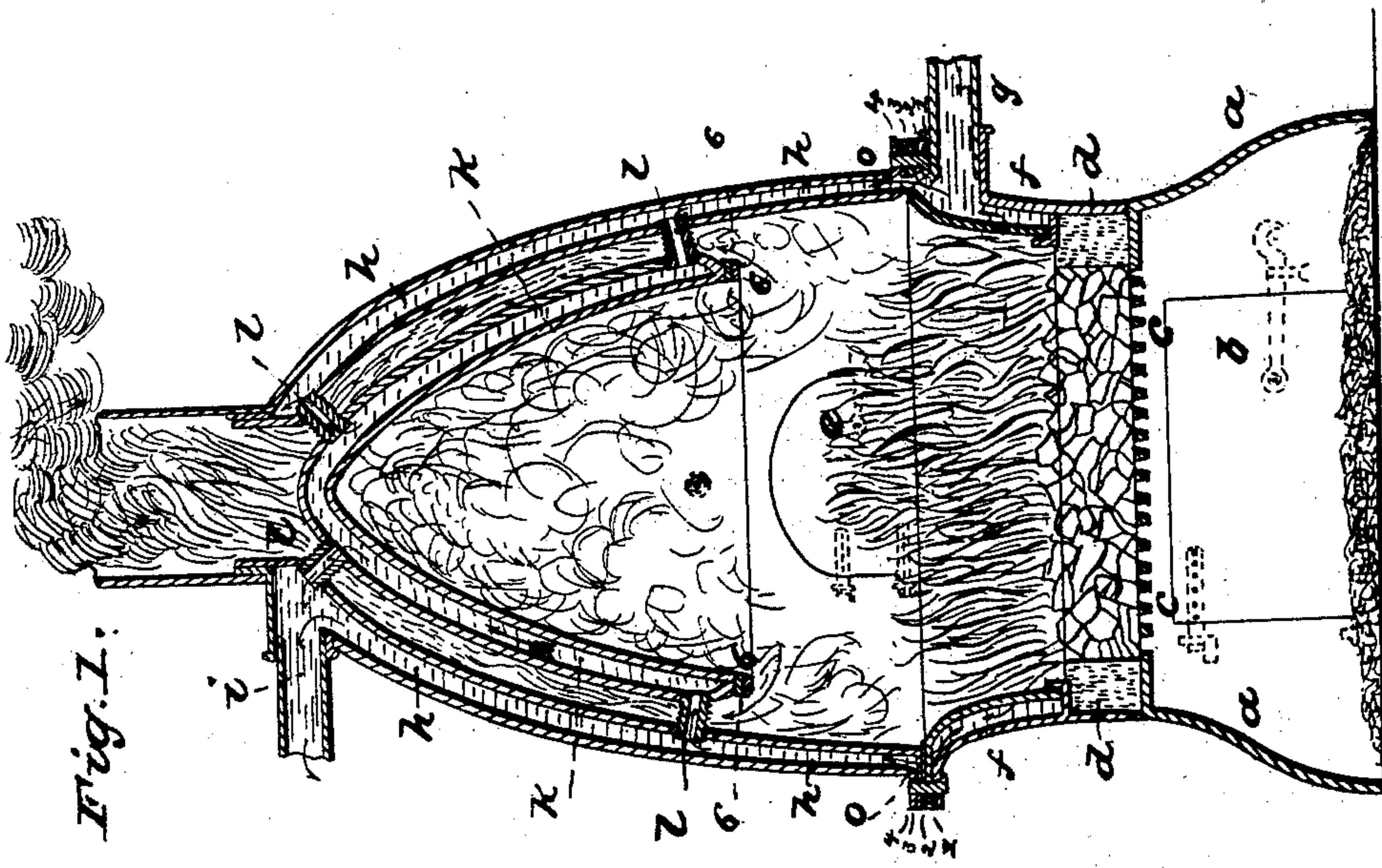


Steam Heater.

Patented June 28, 1859.



Witnesses:
 Samuel W. Merrill,
 Thos Geo. Harold.

Inventor
C. B. Chung.

UNITED STATES PATENT OFFICE,

EDMUND B. CHEREVY, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND THOS. W. WEATHERED, OF SAME PLACE.

IMPROVEMENT IN FURNACES.

Specification forming part of Letters Patent No. 24,599, dated June 28, 1859.

To all whom it may concern:

Be it known that I, EDMUND B. CHEREVY, of the city, county, and State of New York, have invented, made, and applied to use a certain new and useful Improvement in Furnaces for Hot-Water Heating Apparatus and Boilers; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a vertical section of my furnace, and Fig. 2 is a sectional plan of the same at the line A A.

Similar marks of reference indicate the same parts.

My said invention relates to furnaces or boilers that are used with hot-water-circulating apparatus for warming buildings. For this purpose both horizontal and vertical boilers have before been used, and these formed with one or two water-spaces.

My invention consists in a peculiar construction of furnace in which two water-spaces are used, the one within the other, and formed of a dome shape in such a manner that the heat first circulates up into the dome and then descends and passes away between the two domes, thereby confining the heat in such a manner as to make it the most efficient in heating the water that circulates through said boiler.

In the drawings, *a* is the base of the furnace, forming an ash-pit with the door *b*.

c c are the grate-bars, and *d* the fire-brick or soapstone surrounding the fire.

f is a double casing surrounding the fire, into which the return circulating water is led by the pipe *g*.

h is a water-space between two dome-shaped casings, and the flanges of these casings are all turned outward, as seen at 1, 2, 3, and 4, Fig. 1, where they are riveted or bolted together and packed with cement or iron-filings or other material. The flanges and joints are thus entirely out of reach of the fire and are accessible for repairs in case of necessity, instead of requiring the boiler to be taken to pieces for repairing or repacking any leaky joints. Before these flanges are attached to-

gether or the outer case of the dome *h* put on I bore holes through the flanges 2 and 3—say about eight holes—around the dome, tap a screw-thread therein, and screw in short thimbles or sections of pipes to provide openings, as at *o o*, through which the water circulates, as shown by the arrows.

k is a double dome, the edges of which are connected together and packed, as at 6 6, that sets within the dome *h*, leaving a flue or space between the domes *k* and *h* for the passage of draft to the smoke-pipe *m*.

l l are screwed pipes or thimbles of any desired number connecting the water-spaces *h* and *k*, so that the water will circulate as shown by the arrows and pass away by the flow-pipe *i* to the hot-water warming-pipes, in which said water circulates and returns by the pipes *g*. These thimbles *l* are to be inserted before the outer dome is put on. The inner and outer domes *h* are to be packed at 5 5.

The operation of my furnace is as follows: The heat rises from the fire into the hollow dome *k*, imparting thereto its heat, and having to descend before passing away between the domes *h* and *k*, maintains a plenum in said dome *k*, and again the heat is absorbed still further by the outer casing of the dome *k* and inner casing of the dome *h*, as said heat passes between these casings before going off by the flue *m*. Thus a perfect combustion and complete absorption of the heat is obtained and a very large extent of surface is obtained in a small space, and that without any tendency to obstruct free circulation of the hot water or any opportunity for steam to form at any place to allow the heat to injure the boiler. The whole apparatus is easily constructed or repaired whenever necessary, and is durable and highly efficient, producing a great saving in consumption of fuel.

Having thus described my said invention, I do not claim one water-space within another, neither do I claim a vessel containing water within a dome or boiler; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The hollow dome *k* over the fire, in combination with the dome *h*, in the manner and

for the purposes specified, whereby the heat ascends into said dome *k* and then passes away between the domes *h* and *k*, heating the circulating water, as specified.

2. The thimbles *o o*, passing through the flanges 2 and 3 and forming openings for the circulating water, substantially as specified.

In witness whereof I have hereunto set my signature this 23d day of May, 1859.

E. B. CHEREVY.

Witnesses:

LEMUEL W. SERRELL,
THOS. GEO. HAROLD.