

(No Model.)

C. H. PAGE, Jr.
APPARATUS FOR HEATING WATER.

No. 521,917.

Patented June 26, 1894.

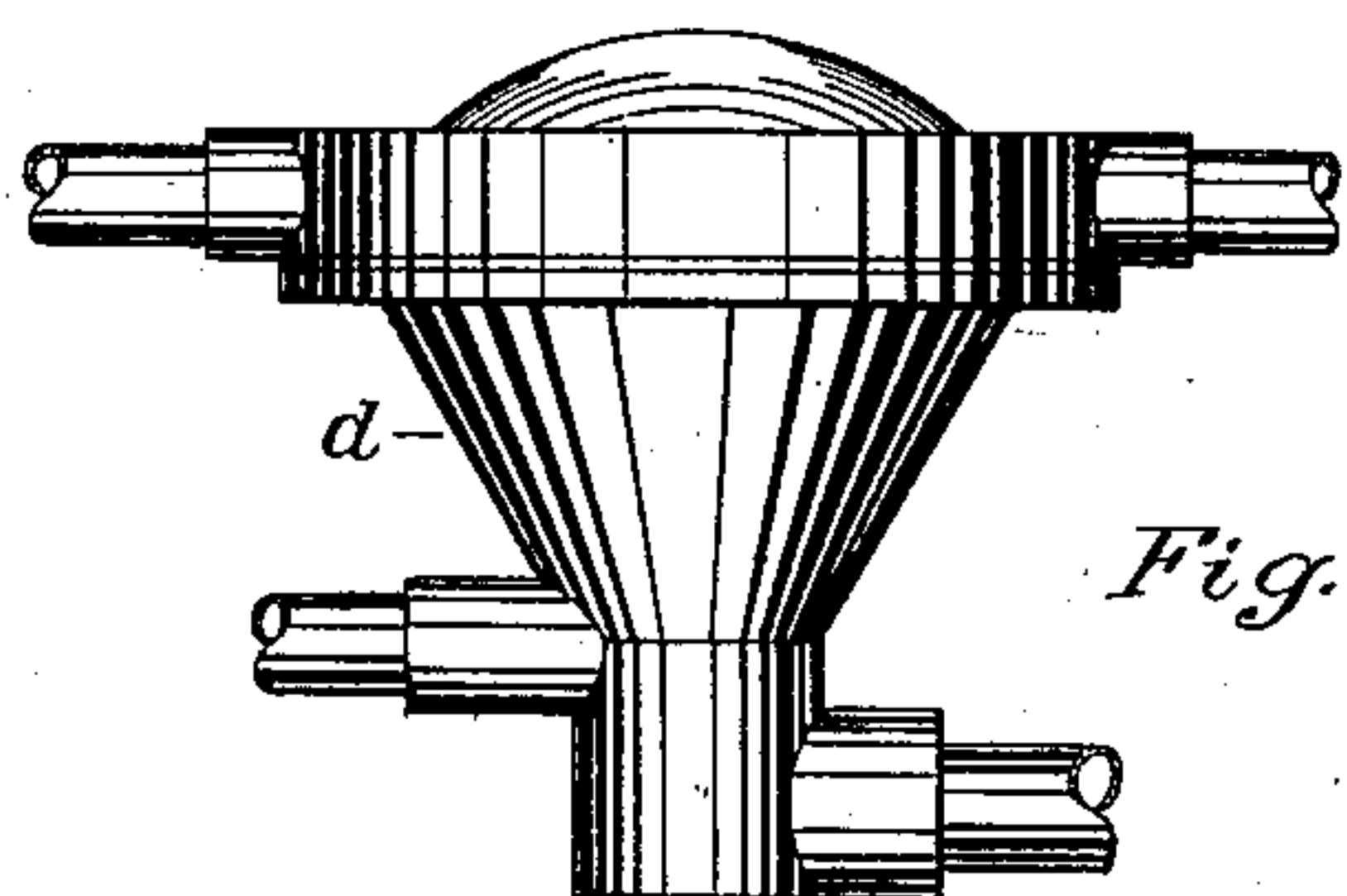


Fig. 3

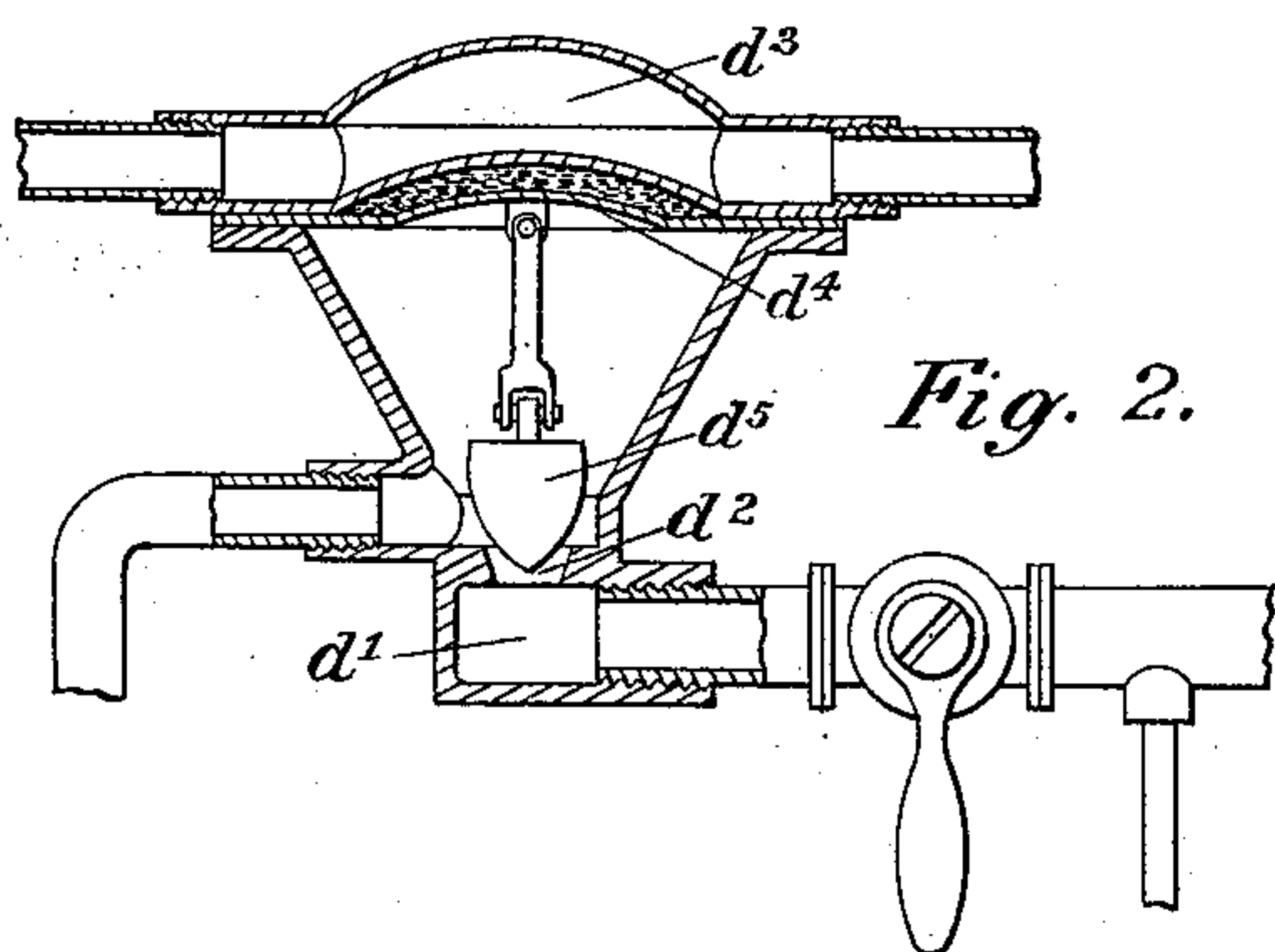


Fig. 2.

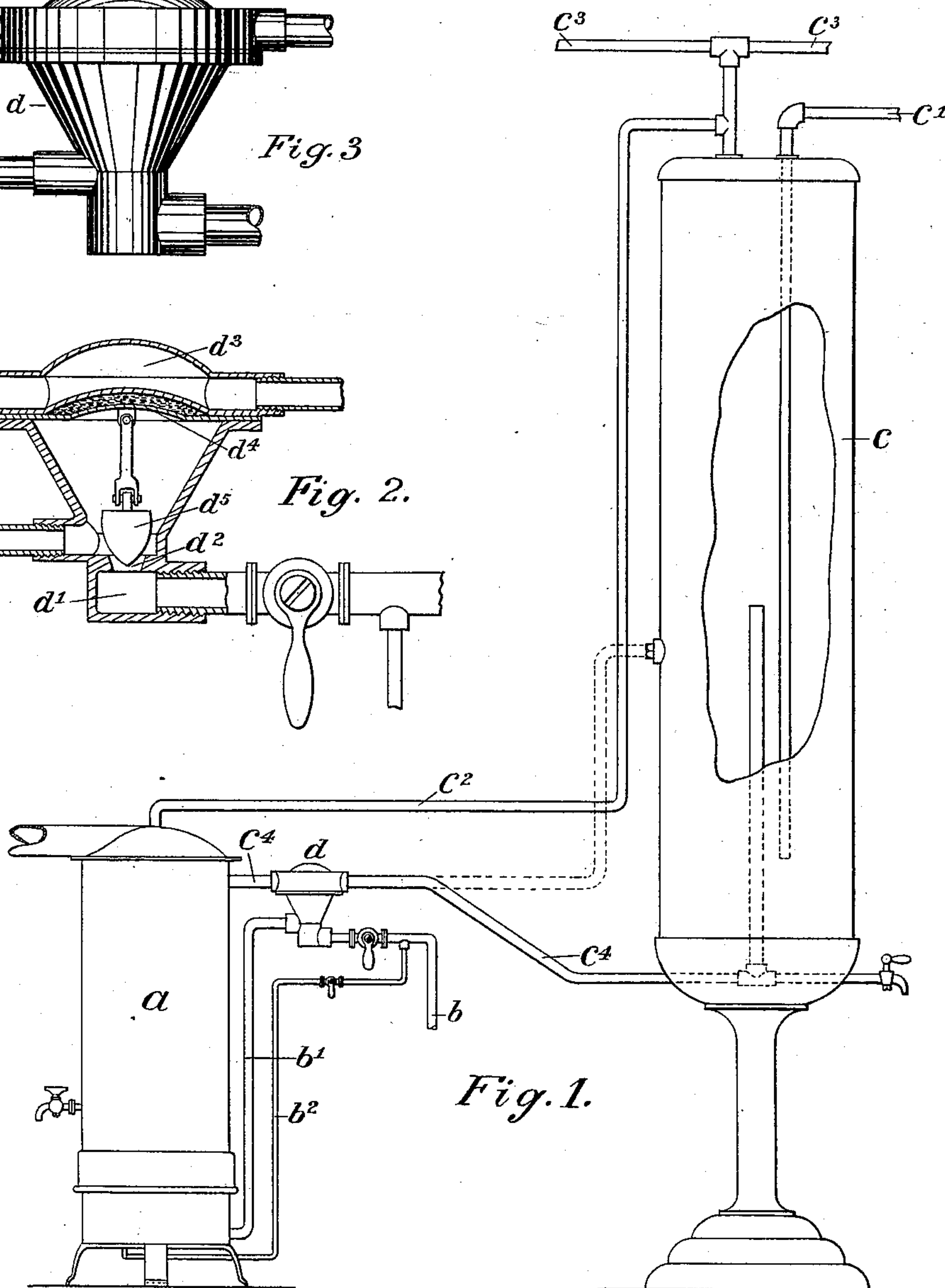


Fig. 1.

WITNESSES:

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UNITED STATES PATENT OFFICE.

CARTER H. PAGE, JR., OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
UNITED GAS IMPROVEMENT COMPANY, OF SAME PLACE.

APPARATUS FOR HEATING WATER.

SPECIFICATION forming part of Letters Patent No. 521,917, dated June 26, 1894.

Original application filed September 25, 1893, Serial No. 486,400. Divided and this application filed December 30, 1893. Serial
No. 495,241. (No model.)

To all whom it may concern:

Be it known that I, CARTER H. PAGE, Jr., a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Heating Water, (for which I filed an application, Serial No. 486,400, dated September 25, 1893,) of which the following is a divisional specification.

The principal objects of my present invention are, first, to provide simple, efficient, and economical apparatus for insuring a supply of water heated to the required temperature, and, second, to provide a compact, reliable, and comparatively inexpensive thermostatic device exposed to the incoming water only and adapted to accurately control the supply of gaseous fuel.

My present invention consists in the apparatus hereinafter fully described and claimed.

The nature, characteristic features and scope of my present invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, and in which—

Figure 1, is an elevational view illustrating apparatus embodying features of my invention and showing the thermostatic device disposed between and located outside of a heater and a boiler. Fig. 2, is a transverse central section of the thermostatic device illustrated in Fig. 1, and Fig. 3, is a side elevational view of the thermostatic device.

In the accompanying drawings, *a*, is a water heater.

b b', is a pipe for supplying gaseous fuel to the burner of the heater *a*.

b², is a pipe for supplying gas to a continuously burning pilot light located adjacent to the burner.

c, is an ordinary boiler such as is to be found in the kitchens of most dwellings.

c', is a pipe through which water, at approximately the same temperature, is introduced from the main or other source of supply and discharged near the bottom of the boiler.

c², is a pipe through which water previously heated in the heater *a*, is discharged into the

top of the boiler *c*, or is led directly off through the pipes *c³*, for use or distribution. Water to be heated by the heater *a*, is led from at or near the bottom of the boiler *c*, through a pipe *c⁴*. This pipe *c⁴*, may be permitted to extend upward through the interior of the boiler *c*, as indicated by full lines in Fig. 1, or it may be permitted to extend upward and penetrate the curved wall as indicated by dotted lines.

d, is a thermostatic device comprising a gas way *d'*, provided with a valve seat *d²*, and an arched way *d³*, having one of its walls together with a movable arched diaphragm *d⁴*, arranged and constructed to form an inclosed space or chamber for the reception of a volatile substance or material. *d⁵*, is a valve connected with the movable diaphragm *d⁴*, and adapted to co-operate with the seat *d²*. This thermostatic device *d*, is located between and outside of the heater *a*, and boiler *c*, and the respective sections of the inlet water pipe *c⁴*, are connected at opposite ends of the water way *d³*, and the respective sections *b* and *b'*, of the gaseous fuel supply pipe are connected at the opposite ends of the gas way *d'*.

The mode of operation of the hereinabove described apparatus is as follows: Assuming that the water in the boiler *c*, has become cooler than is desired, either by reason of the drawing off of hot water through the distribution pipe *c³*, or for any other reason, it follows that the water flowing through the pipe *c⁴*, and water way *d³*, will condense or contract the volatile material of the thermostat, whereby the diaphragm *d⁴*, is permitted to spring upward and cause the valve *d⁵*, to be lifted from its seat *d²*. Under these circumstances, gaseous fuel is freely supplied through the pipe *b b'*, and gas way *d'*, to the heater *a*, so that the latter heats the water and causes the same to be returned through the pipe *c²*, to the boiler *c*, at the required temperature. This heated water, as it flows past the diaphragm *d⁴*, causes the volatile substance or material of the thermostat to expand, thus shifting the diaphragm *d⁴*, and valve *d⁵*, downward with the result that the supply of gaseous fuel is cut off.

From the foregoing description, it is appar-

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ent that the thermostat d , responds to changes in temperature of the water contained in the boiler c , and is not influenced in any wise by the temperature of the heater a , or of the water contained therein. This is important because it insures a supply of water in the boiler c , at the temperature required for use and without undue expenditure of gaseous fuel. Moreover the thermostat d , is not acted upon by the water from the main or other source of supply. This is advantageous because the temperature of the water from the main or other source of supply is usually approximately constant, varying only with the seasons of the year, and consequently not suitable for controlling the supply of gaseous fuel.

It will be obvious upon reference to Fig. 2, that when the valve d^5 , is open, gas penetrates the interior of the casing and consequently exerts pressure upon the diaphragm d^4 , thus preventing the latter from closing too rapidly and before the temperature of the water in the boiler c , has been substantially raised. Moreover the pressure of the gas in the cas-

ing is exerted upon the diaphragm and by causing the same to tend to open the valve insures a good supply of hot water at all times.

Having thus described the nature and objects of my present invention, what I claim as new, and desire to secure by Letters Patent, is—

A thermostatic device comprising a casing having a gas-way and a water way, a movable diaphragm applied to the water way and exposed to the interior of the casing, a volatile substance or material contained in said casing and a valve attached to the diaphragm and adapted to admit and exclude gas to and from the interior of the casing and the gas-way, substantially as described.

In testimony whereof I have hereunto signed my name in the presence of two witnesses.

CARTER H. PAGE, JR.

Witnesses:

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K. M. GILLIGAN.