

J. W. TUFTS & W. HELMER.

AUTOMATIC HEAT REGULATOR FOR HOT SODA APPARATUS.

No. 519,440.

Patented May 8, 1894.

Fig. 2.

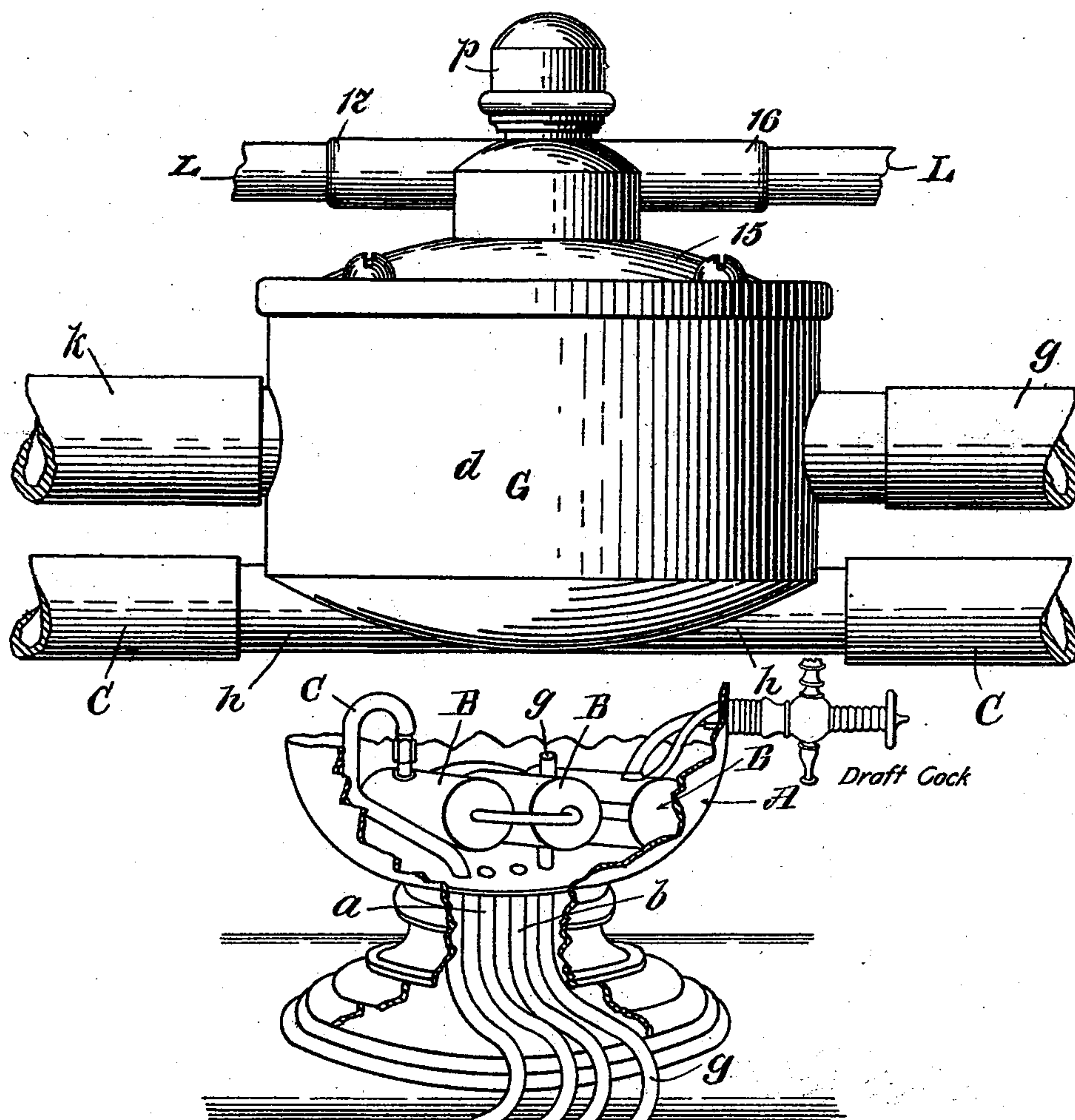
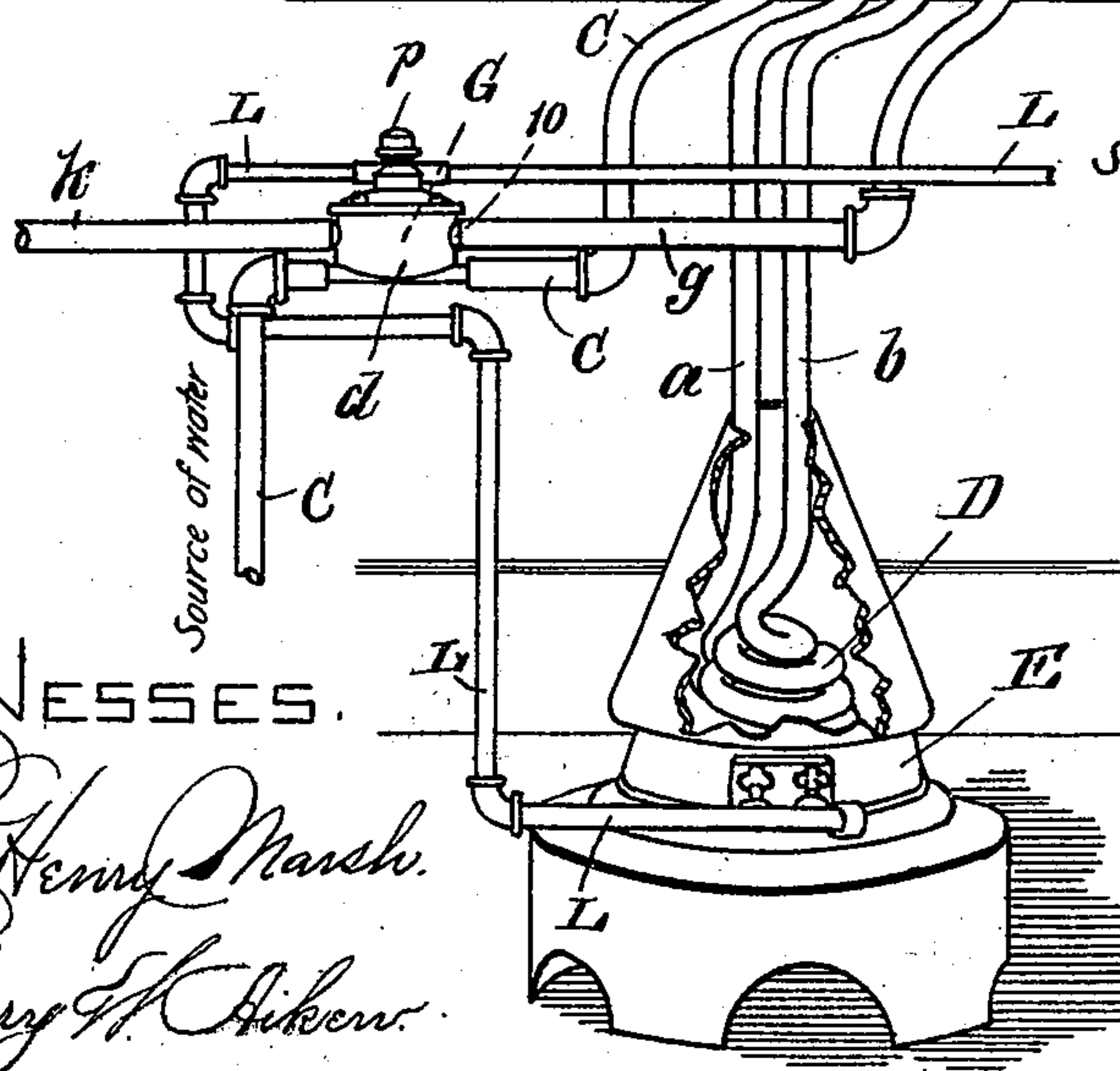


Fig. 1.



WITNESSES.

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Fig. 3.

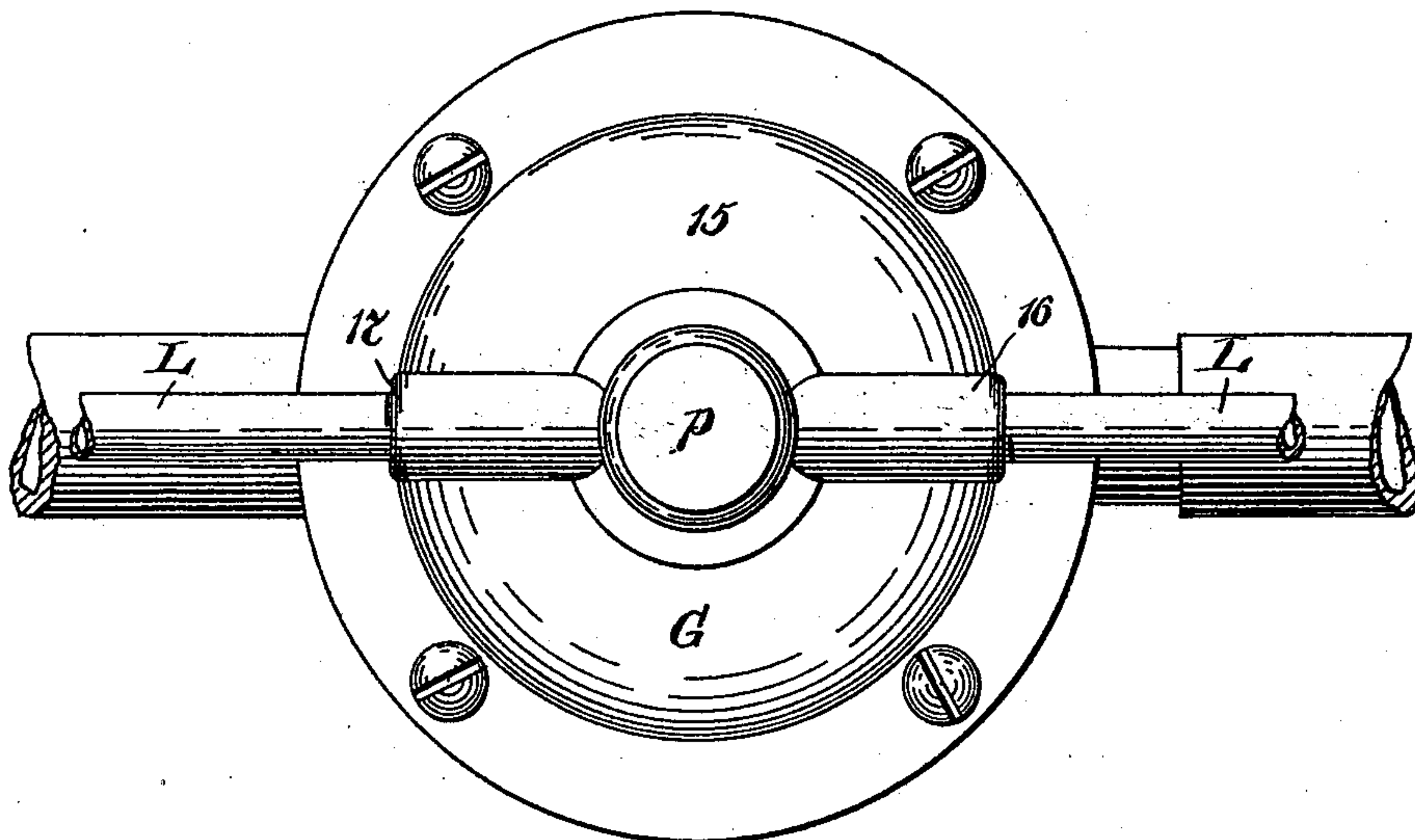
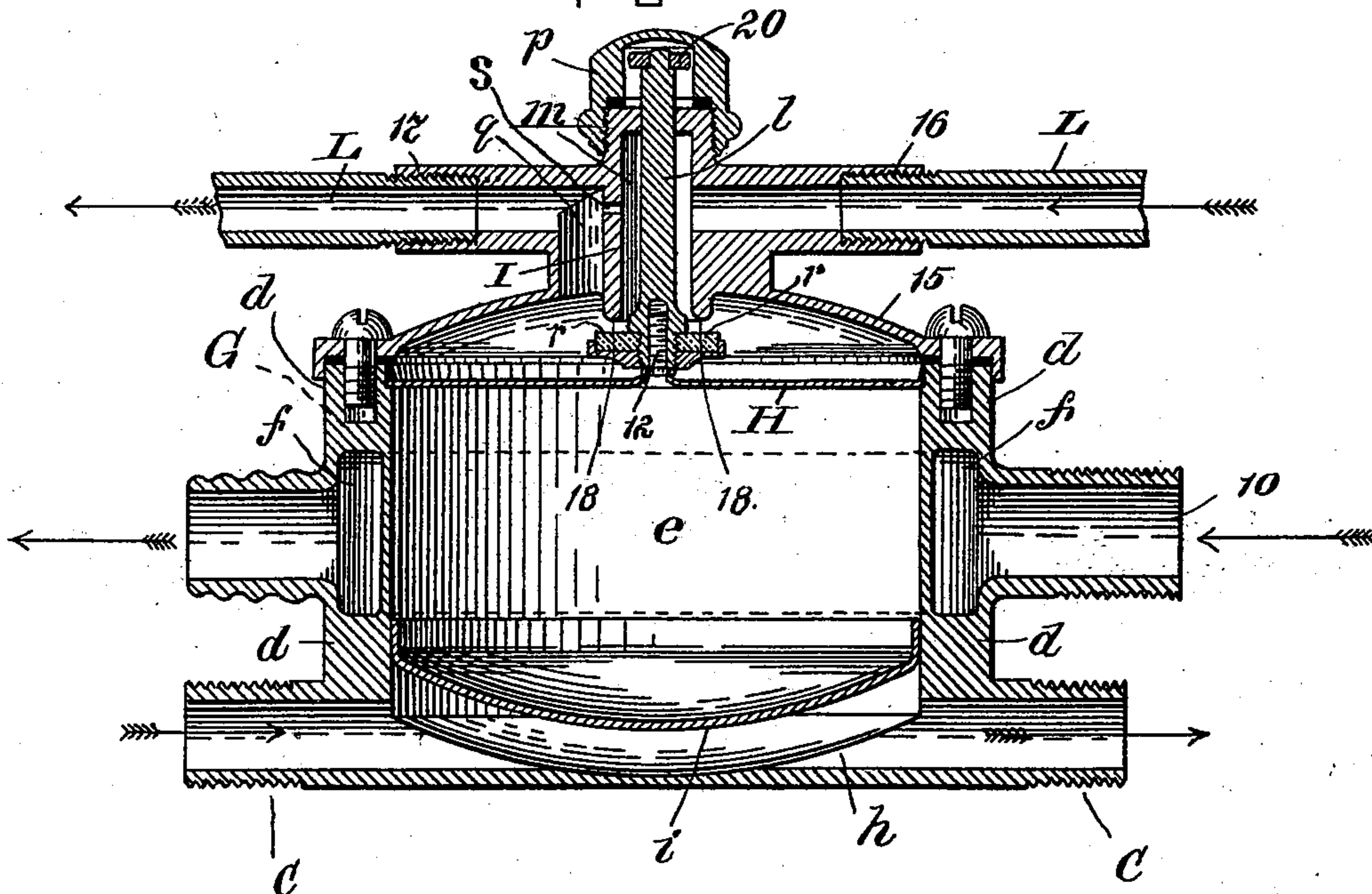


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES W. TUFTS, OF MEDFORD, AND WILLIAM HELMER, OF BOSTON, ASSIGNORS TO THE AMERICAN SODA-FOUNTAIN COMPANY, OF BOSTON, MASSACHUSETTS.

AUTOMATIC HEAT-REGULATOR FOR HOT-SODA APPARATUS.

SPECIFICATION forming part of Letters Patent No. 519,440, dated May 8, 1894.

Application filed November 6, 1893. Serial No. 490,159. (No model.)

To all whom it may concern:

Be it known that we, JAMES W. TUFTS, of Medford, in the county of Middlesex, and WILLIAM HELMER, of Boston, in the county of Suffolk, State of Massachusetts, citizens of the United States, have invented certain Improvements in Automatic Heat-Regulators for Hot-Soda Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a view of a portion of a hot-soda-water apparatus having our improved heat-regulator applied thereto. Fig. 2 is a side elevation of our heat-regulator. Fig. 3 is a plan of the same. Fig. 4 is a central vertical section of the same.

Our invention has for its object to provide a simple and effective device for automatically regulating or controlling the temperature of the water contained in the tank in which are immersed the cylinders or heaters through which the water passes to the draft-cock, whereby the water drawn from said draft-cock is prevented from becoming overheated and is maintained at a proper uniform temperature.

To this end our invention consists in certain novel features and combinations of parts as hereinafter set forth and specifically claimed.

In the said drawings, A, Fig. 1, represents the tank or bath of a hot-soda apparatus, within which are placed the cylinders or heaters B, through which the water passes from the street-pipe C or other source of supply to the draft-cock, not shown; and as these cylinders or heaters B are immersed in the hot water contained in the tank A, the water under pressure passing through them to the draft-cock is heated to the required temperature without the evolution of steam within said heaters, in the usual manner. The water in the tank A is heated as usual by means of circulatory pipes *a, b*, the upper ends of which enter the bottom of the tank A, while at the lower ends of these pipes is formed a coil D which is arranged within a gas-stove or heater E conveniently placed beneath the apparatus.

G represents our improved heat-regulator, by which the supply of gas to the stove E may

be automatically controlled in order to prevent the water in the tank or bath A from becoming overheated which would not only cause it to boil and evaporate too rapidly, but would heat the water passing from the cylinders B to the draft-cock beyond the temperature required for a beverage.

The regulator G is connected with the water supply-pipe C, as shown in Fig. 1, at any suitable portion of its length, and is composed of a casing *d*, provided with an air-chamber *e*, Fig. 4, which is surrounded by an annular chamber or jacket *f* formed in the wall of the casing *d* and having an inlet 10 to which is connected the overflow or waste pipe *g* which extends up within the tank A to the high-water level, and through this pipe *g* the steam rising from the water in the tank A, together with the hot-water produced by the condensation of the steam, pass to the jacket *f* and thence by the outlet pipe *k* to a bucket, sink, or other receptacle adapted to receive it, the air in the chamber *e* being thus heated in proportion to the amount of steam or hot water passing through the jacket *f*. At the bottom of the casing *d* is a straight passage *h* through which the cold water from the source of supply passes directly in contact with the bottom *i* of the air-chamber *e*, the air in which is thus cooled by the passage of the cold water. At each end of the passage *h* is formed a screw-threaded nipple which is adapted to be coupled to the end of the supply pipe C next adjacent thereto.

Secured within the casing *d* and forming the top of the air-chamber is a flexible diaphragm H, from the center of the upper side of which projects a vertical screw 12, upon which is screwed a valve *r* having a vertical stem or spindle *l* which projects up through a cylindrical chamber *m* formed in the casing I of the gas-valve, which casing is formed integral with or secured to the removable top 15 of the casing *d*. This valve casing I is connected at 16, 17, with the pipe L, through which gas is supplied to the gas-stove or heater E.

The upper end of the valve-stem *l* passes freely through the top of the chamber *m*, above which it is provided with a knob or handle 20

by which it may be turned to raise or lower the gas-valve *r* on the vertical screw 12 away from or toward the diaphragm *H*, and thus vary its distance from the valve-seat 18 formed
 5 by the lower edge of the chamber *m*. The projecting end of the valve-stem and its knob 20 are inclosed within a cap *p* screwed tightly over the top of the casing *I* to prevent the escape of the gas at this point. When the
 10 gas-valve is open, as shown in Fig. 4, the gas passes into the chamber *m* and down under the lower edge thereof into an outlet passage *q* and thence out through the gas pipe *L* to the stove *E*, but when the valve *r* is entirely
 15 closed, as might sometimes occur, the gas passes through a small aperture *s* extending from the chamber *m* to the gas outlet in sufficient quantity to prevent the stove burners from becoming extinguished, which it is ob-
 20 vious that it would be desirable to avoid.

The operation of the regulator is as follows: When the water in the tank or bath *A* becomes highly heated, the steam rising therefrom, together with the hot water produced
 25 by condensation, passes by the waste-pipe *g* to the jacket *f* around the casing *d*, heating the air in the chamber *e* and causing it to expand and raise the diaphragm *H* and with it the valve *r*, whereby the supply of gas is partially
 30 or wholly cut off from the stove *E* according to the degree of heat in the air-chamber. As the water in the tank *A* becomes cooler, the jacket *f* receives less steam and hot water, and the air chamber becomes cooled by the cold
 35 water passing through the passage *h* in con-

tact with its bottom *i*, when the pressure of the air on the diaphragm *H* is lessened, causing the valve *r* to be withdrawn from its seat to increase the quantity of gas supplied to the stove, and in this manner the heat can be au-
 40 tomatically regulated with great nicety and all liability of the water in the tank *A* becoming overheated is thus entirely avoided.

What we claim as our invention, and desire to secure by Letters Patent, is—

The herein described automatic heat-regulator for hot-soda apparatus, consisting of a casing containing an air-chamber and provided on the outside of said air-chamber with a steam or hot-water jacket having inlet and
 50 outlet pipes connected therewith, whereby the air in said chamber is heated, and said casing having a separate passage connected with other inlet and outlet pipes through which the cold water from the source of supply
 55 passes in contact with the outside of said air chamber on its way to the boiler, in combination with a flexible diaphragm forming one side of said air chamber, and a gas-supply-pipe provided with a valve connected with
 60 said diaphragm, all constructed to operate substantially in the manner and for the purpose set forth.

Witness our hands this 3d day of November, A. D. 1893.

JAMES W. TUFTS.
 WILLIAM HELMER.

In presence of—
 WM. S. STONE,
 J. F. HINDS.