

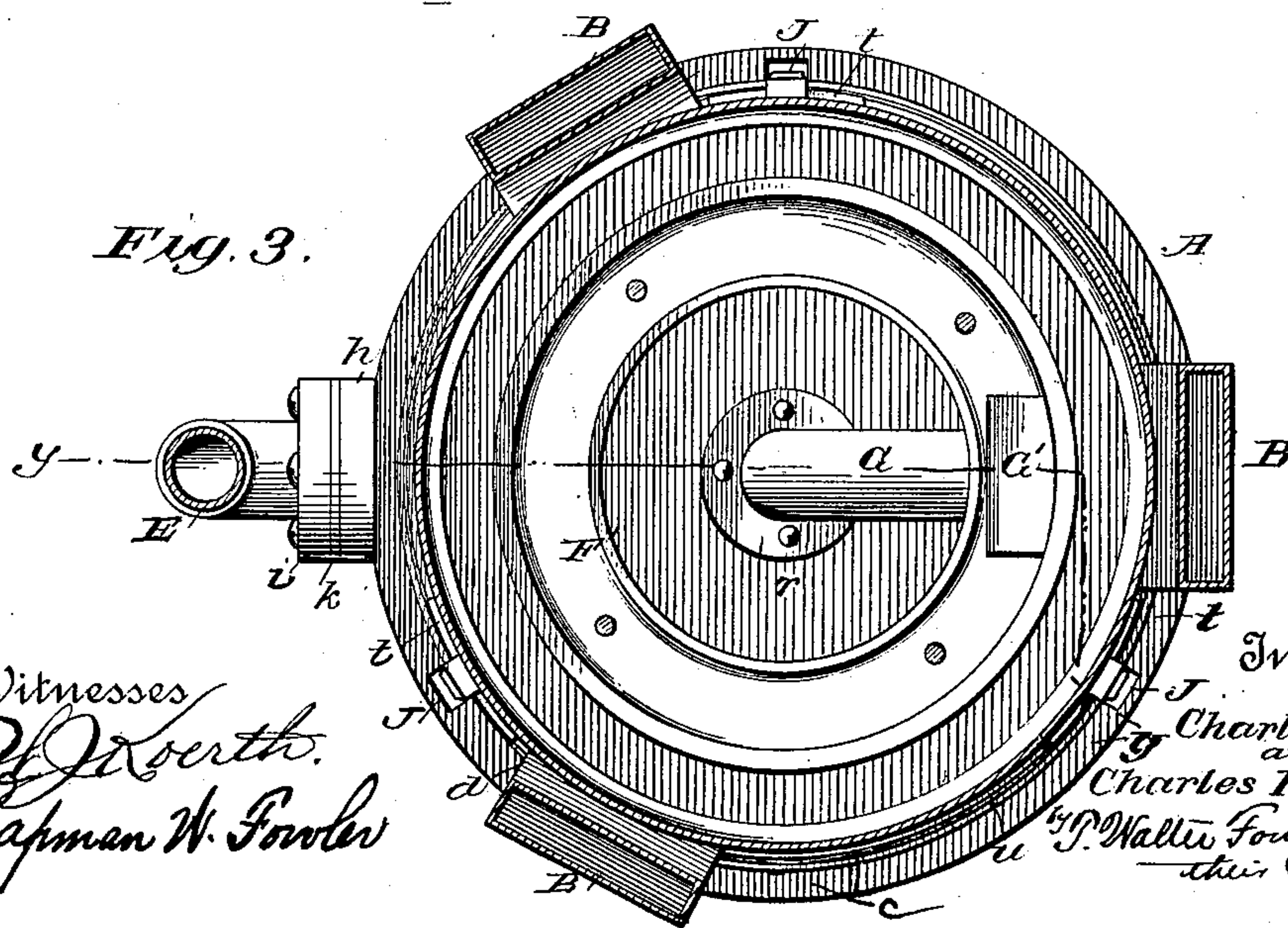
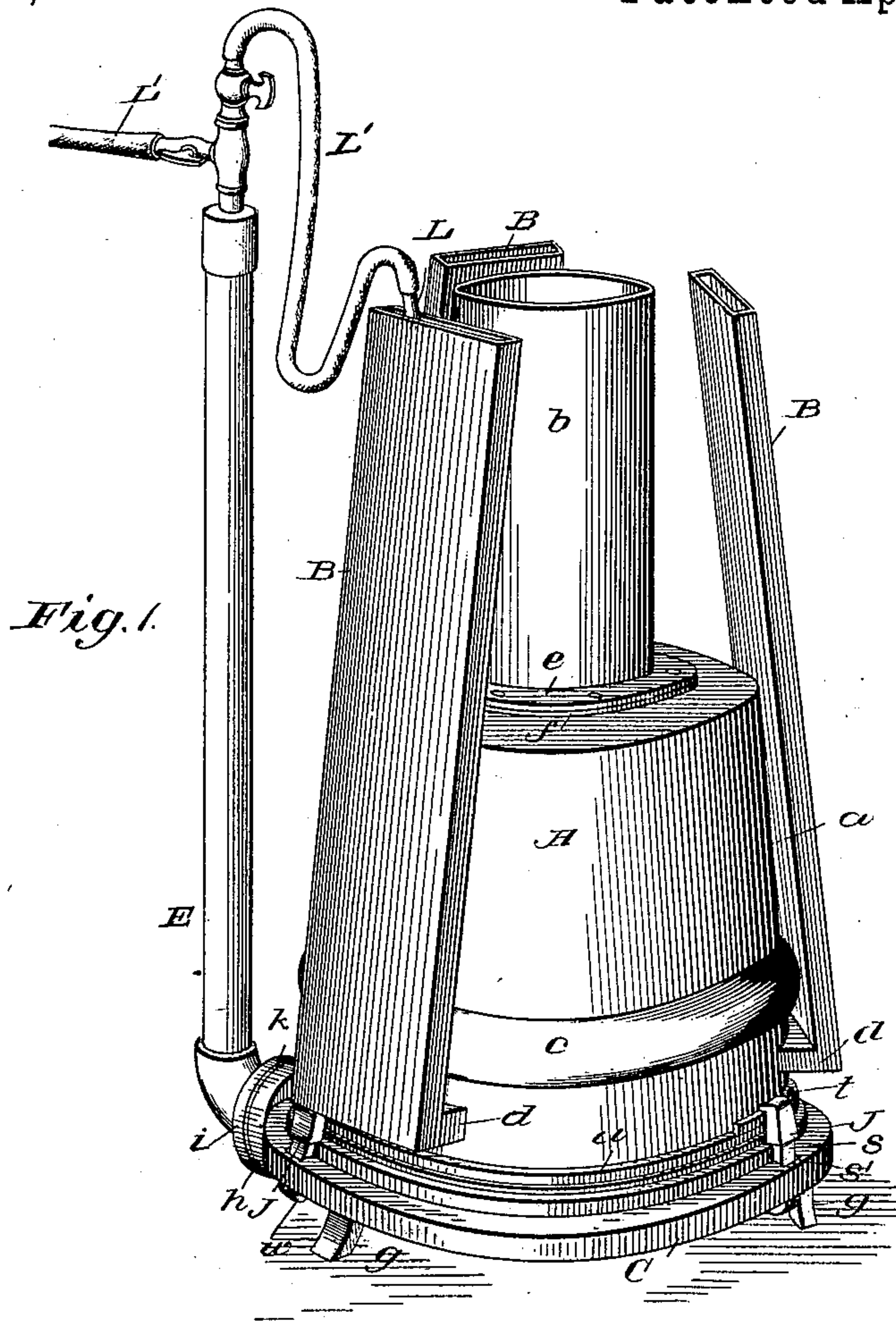
(No Model.)

2 Sheets—Sheet 1.

C. R. TYLER & C. F. PRIES.
WATER HEATER.

No. 602,040.

Patented Apr. 5, 1898.



Witnesses
J. Koertth.
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Inventors
Charles R. Tyler.
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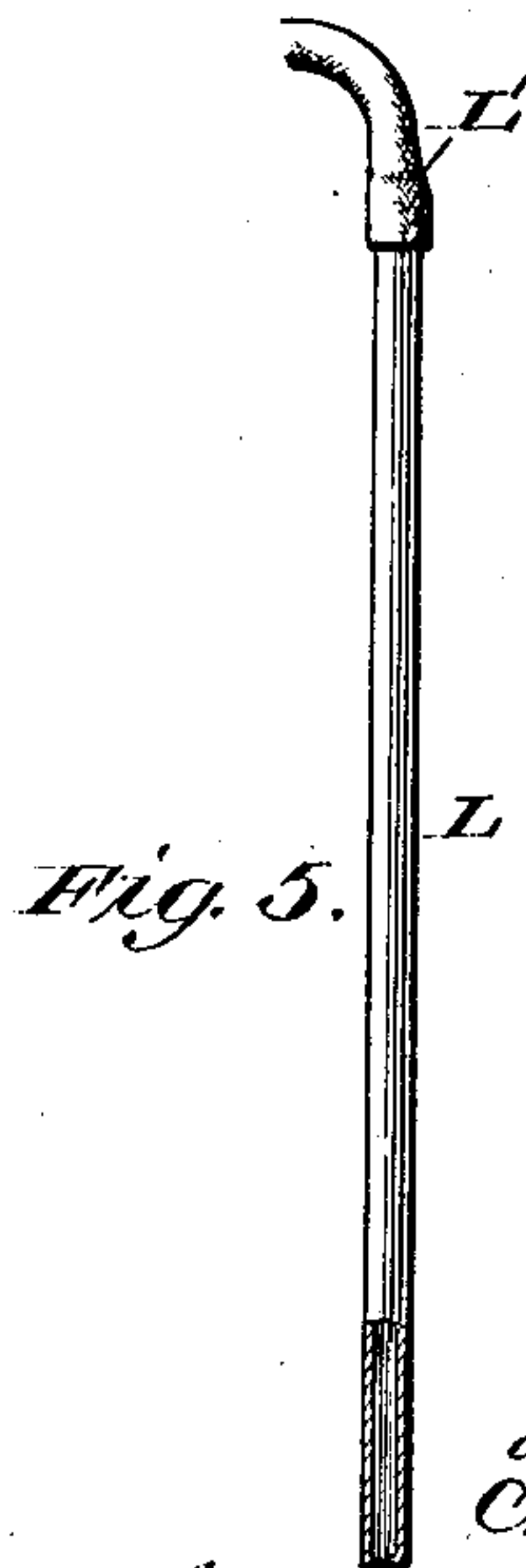
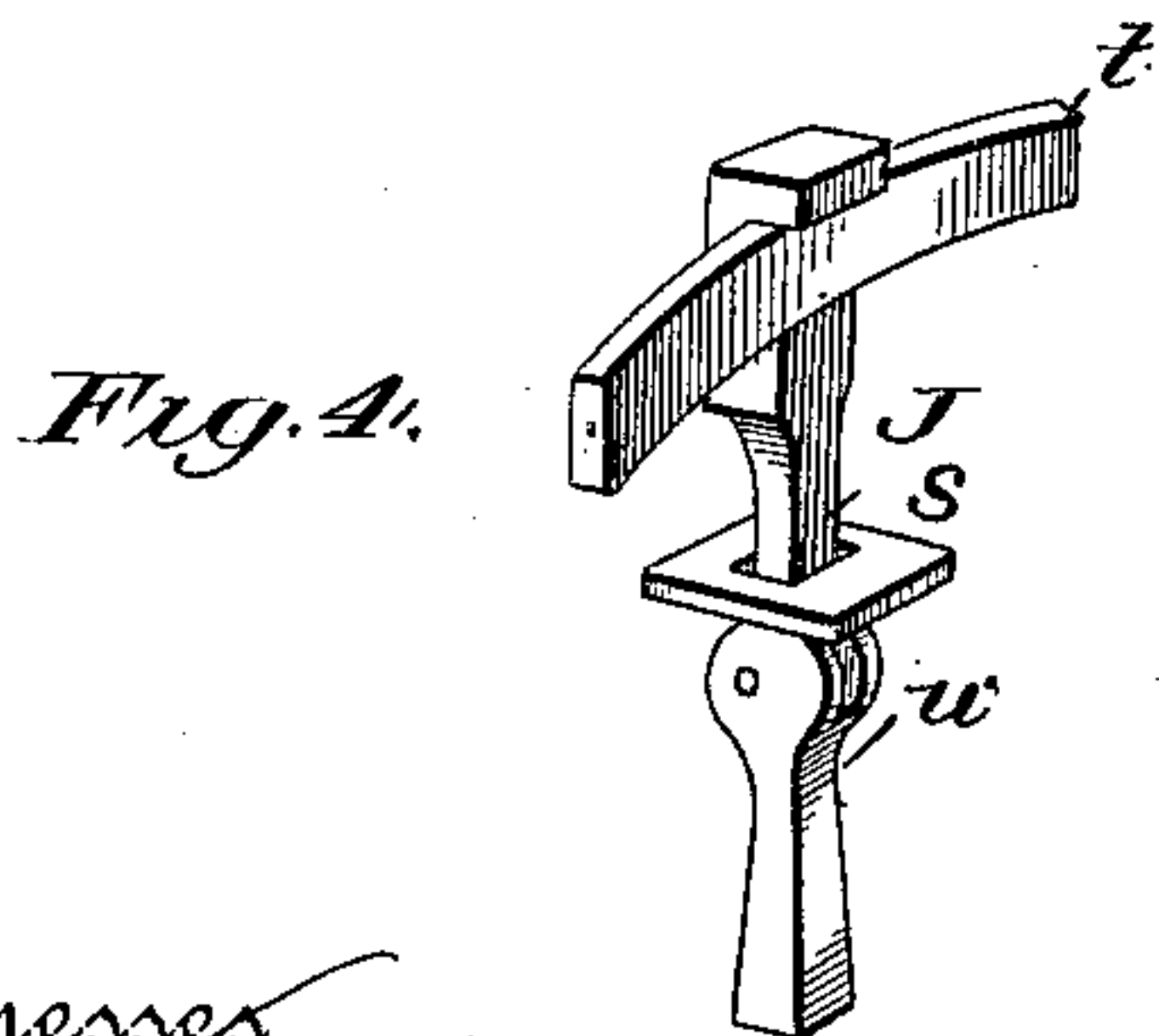
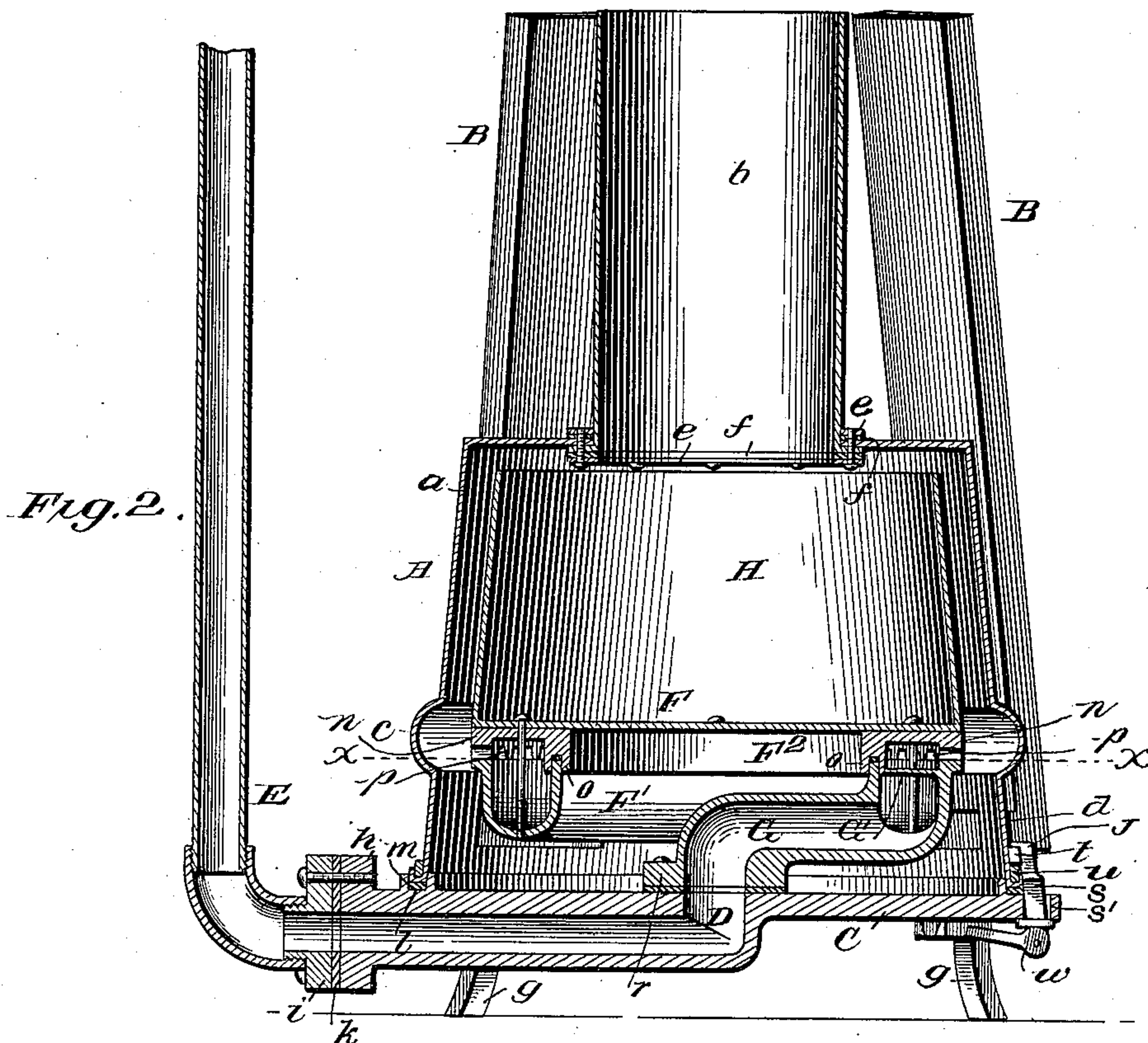
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Inventors
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Charles F. Pries,
by *J. Walter Fowler* their Attorney

UNITED STATES PATENT OFFICE.

CHARLES RACINE TYLER AND CHARLES F. PRIES, OF BROOKLYN, NEW YORK;
SAID TYLER ASSIGNOR TO CHARLES F. WALTHER, OF SAME PLACE.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 602,040, dated April 5, 1898.

Application filed November 13, 1897. Serial No. 658,408. (No model.)

To all whom it may concern:

Be it known that we, CHARLES RACINE TYLER and CHARLES F. PRIES, citizens of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Water-Heaters, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates to portable devices adapted to be placed in or under water for the purpose of heating the same; and it consists of the parts and the constructions and combinations of parts which we shall hereinafter fully describe and specifically claim.

The essential object of our invention is to provide a heating device adapted to be partly or wholly submerged in water for the purpose of raising the temperature of the same, the heater being especially useful for removing the chill from the natural temperature of water used in bath-tubs for bathing purposes. In most instances water used for the purpose mentioned is heated by boiler connected with the kitchen-range, although gas stoves and appliances are frequently used during warm weather. Devices of the character herein specified save heating the water by separate boilers and transporting it from said boiler to the bath-tub, which latter fixture is in many instances located one or two stories from the place where the water is first heated.

The present arrangement provides a simple and comparatively inexpensive heater which has water-tight joints, adapting it to be wholly or partly submerged in the bath-tub, whereby the temperature of the water in the tub may be raised by the heat generated from the burning of gas supplied to the interior of the heater from the ordinary house gas-burners.

In the accompanying drawings we illustrate an improved water-heater, and wherein—

Figure 1 is a perspective view of a water-heater constructed according to our invention. Fig. 2 is a vertical sectional view of the same on the line *yy* of Fig. 3. Fig. 3 is a horizontal sectional view on the line *xx* of Fig. 2. Figs. 4 and 5 are details of construction to be hereinafter referred to.

In said drawings, A represents the outside shell or casing, which may be made of any

suitable material, such as copper. This shell or casing comprises a dome or cylinder *a*, which preferably is tapered from its lower end upwardly, and from its upper end extends a pipe or tube *b*, which serves as a flue for the escape of the products of combustion. The lower end of the tapering dome or cylinder is open, and a short distance above this end the cylinder or dome is expanded or formed with an annular enlargement *c*, to be hereinafter referred to.

Exterior of the cylinder or dome and formed rigid with it, so as to provide against leakage to the inside of the heater, are a series of tubes *B*, herein shown as three in number, spaced equidistant around the cylinder and having elbows *d*, which open to the inside of the cylinder, just above its bottom edge. These tubes *B* may be of any appropriate form, but are herein shown as rectangular in cross-section, and they extend upwardly above the cylinder and serve as air-tubes for supplying to the heater the necessary constituents to promote the combustion of the fuel (gas) used, the air entering open tops of the tubes and passing in a downward direction through them and being discharged within the cylinder proximate to the burner, as shown.

The parts so far mentioned—namely, the cylinder or dome and the air-tubes—are made as a single substantially integral structure, the air-tubes being brazed or soldered or otherwise made rigid with the cylinder, and the central flue riveted in place and made water-tight by means of suitable rings or plates *e* and washers *f*, as shown in Fig. 2.

The base *C* of the heater is formed as a single casting and is supported upon short legs *g*. It has in its under side a passage *D*, which opens up through the center, while the inlet end of this passage has a head or flange *h*, to which is bolted a head or flange *i*, provided with a short threaded nipple, to which the gas-inlet pipe *E* is screwed, said heads or flanges having an asbestos or other packing or washer *k* between them to insure a water-tight joint at this point.

On the upper side of the base and near the outer edge thereof is formed an upwardly-projecting flange provided with a groove or channel *l*, in which is placed a rubber, as-

bestos, or other washer or packing *m*, and within this groove or channel and upon the said washer or packing the lower edge of cylinder or dome *A* is seated, the parts being drawn closely together to make a water-tight joint by means of suitable locking devices, which we will presently refer to.

Just above the base is located a burner *F*, which comprises a fixed and removable part. The fixed part *F'* is formed as a single casting and has an open center, and it comprises an annular ring substantially U-shaped in cross-section to form a containing-chamber for the gas. The removable part *F²* is designed to be seated on the fixed part and secured thereto by means of bolts adapted to pass through holes in said part *F²* and to be screwed into corresponding holes in the base or bottom of the companion part *F'*. The removable part *F²* or upper section of the burner also has a depending flange *n* around its outer circumference and a second depending flange *o* surrounding its inner circumference or central opening, said flange *o* having a groove or channel with contained packing or washer adapted to be seated closely upon the flange which circumscribes the open center of the fixed member or lower section *F'* of the burner, and said upper section has its exterior flange *n* radially grooved or formed with outlets *p* for the gas, as shown in Fig. 2.

The upper section *F²* covers and forms the top of the gas-chamber in the lower section, and the lower section or member is cast with a curved tube or channel *G*, which carries a flange or head *r* at one end, which enables it to be bolted to the top of the base directly in line with the discharge end of the pipe or passage *D*, the opposite end of the curved pipe *G* opening through the inner wall of the lower section of the burner, so as to admit the gas to the interior chamber. In this gas-chamber and just over the discharge end of the curved pipe is a plate or shelf *G'*, which substantially closes the chamber at this point and serves to deflect the inflowing gas, so that it will circulate in the chamber and be discharged through the burner-outlets.

The major diameter of the burner is sufficiently less than the interior diameter of the outer shell or casing to provide for the free passage of the heat, and the burner outlets or openings are in line with and discharge into the enlarged or expanded portion of the outer shell or casing, so as to temporarily retard the upward passage of the flame and heat and to give more surface heat.

To further increase the heating capacity of the heater, we secure to the top of the burner by the same bolts or screws which secure the members of the burner together a cylinder *H*, which may be made of sheet-iron or other suitable material, and which is slightly tapered from its bottom upwardly to substantially correspond with the taper of the cylinder or drum *A*. This cylinder *H* has a closed bottom resting directly on the burner and an

open top, and its object is, with the companion exterior cylinder or drum, to increase the heat-radiating surface and thereby facilitate the more rapid heating of the water. To further increase the heating capacity of the heater, the central flue or pipe *b* is materially less in diameter than the top of the cylinder or drum *A*, and the heat from the gas passes from the burner and first impinges on the expanded annular part of the cylinder and then passes upwardly between this cylinder and the inner cylinder *H* and strikes against the top surface of the cylinder *A* before it escapes through the flue, the latter, because of its contracted size, serving to hold the heat in the heater as long as possible, so that the maximum amount of heat may be secured with as little consumption of gas as possible.

As before stated, the outer shell or casing and the base or table are securely locked together to form a water-tight joint, and the means we prefer to use for this purpose consist of suitable lock-ups or fastenings *J*. (Shown in Figs. 2 and 4.) These comprise suitable bars *s*, having reduced shanks which are loosely passed through openings *s'* in the base and near the outer edge thereof, said bars having cross-bars *t* secured to their upper ends and curved to correspond with the curvature of the outer shell or case, which latter is provided around its bottom with a flange *u*, over which the curved bars *t* are passed. The shanks of the bars *s* extend below the base and have pivotally secured to them the cam-levers *w*, a washer being preferably placed between the cam-heads of the levers and the under side of the base to receive the wear of said heads. These locking devices are disposed around the base of the heater at regular intervals and their shanks are sufficiently loose in the openings through which they pass that said devices have enough movement laterally to enable the curved bars *t* to be passed over and removed from the flange *u*. To lock the base to the shell or casing, the latter is placed on the former, with the bottom edge resting in the groove or channel *l*. Then the curved cross-bars *t* are passed over the flange *u* and the levers *w* are turned about their pivots to cause the cam-heads to press against the bottom of the base or the interposed washer and thereby draw the said cross-bars tightly down upon the flange *u*. To release the parts, as when access is desired to the interior of the heater, the levers *w* are pressed in the opposite direction and the curved cross-bars lifted off the flange *u*.

In addition to the parts described we employ a pilot-light to ignite the gas at the burner. This preliminary lighter consists of a tube *L*, carried by a flexible tube *L'*, connected with the gas-service pipe by a valve-controlled coupling. When the gas is turned into this flexible tube and lighted at the end of the tube *L*, the latter is passed down into one of the air-tubes and the gas fed to the burner is lighted at the burner-outlets.

The device described is cheaply constructed, compact, and effective and will be found extremely useful for the purposes described. It is air and water tight at its joints and presents a maximum of surface area for effecting a rapid increase of the temperature of the water in or under which the heater is placed.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a water-heater, the combination of a base or table having a circumferential groove or channel and a passage or pipe in its under side and leading up through its center, a burner supported above said base or table and having a pipe or passage connecting with the passage in the base, and discharging within the burner, a shell or casing surrounding the burner and having its lower edge seated in the groove or channel of the base so as to make a tight joint therewith, means for detachably locking the shell or casing to the base and means for admitting air to the burner.

2. A heater adapted to be placed in or under water and consisting of a base formed integrally with a pipe or passage, and means connecting the same with a gas-supply pipe, said pipe or passage opening up through the center of the base; a two-part burner, one of whose members is formed rigid with a pipe or passage which connects at one end with the passage in the base and whose opposite end discharges into the burner, and an exterior shell or casing and means for detachably locking it to the base, and making a tight joint therewith, said shell or casing having an expanded or enlarged annular portion in line with the burner-openings.

3. In a heater to be placed in or under water, the base or table and the burner and means for admitting gas thereto, in combination with a shell or casing surrounding the burner and made rigid with air-feeding pipes or tubes, a cylinder inside of the shell or casing and secured directly on top of the burner, and located in the upper part of the shell or casing,

and a flue or pipe of reduced diameter leading from the upper part of said shell or casing.

4. The combination with the base or table, a burner supported above the same and means for supplying gas thereto, of an exterior shell or casing tapering from its bottom upwardly and made rigid with air-feeding tubes and a central flue of reduced diameter, said shell or casing having an expanded portion or annular enlargement approximately in line with the burner outlets or openings.

5. The combination of the base, the burner, the exterior shell or casing having a flange around its lower portion, the locking devices for the shell consisting of vertically-disposed bars placed around the base and having shanks fitting openings therein, curved transverse bars on the upper ends of the vertical bars, and adapted to engage the said flange of the shell, and levers pivotally secured to the shanks of the vertical bars and having cam-heads to engage the base whereby the upper transverse bars draw the shell or casing down on the base to make a tight joint, and means for feeding gas and air to the burner.

6. An improved water-heater consisting of a base formed integral with a gas-supply passage and annular groove or channel, a burner having a gas-passage communicating with the passage in the base, an interior cylinder secured to the top of the burner, an exterior shell or casing seated on the base and made rigid with air-feeding pipes and having a central flue of reduced diameter, leading from its upper end, means for detachably locking the shell or casing to the base, means for supplying gas to the burner and a pilot-light consisting of a tube to be passed into one of the air-feeding tubes to ignite the gas at the burner.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES RACINE TYLER.
CHARLES F. PRIES.

Witnesses:

JOHN P. WILVER,
A. B. LOCKWOOD.