

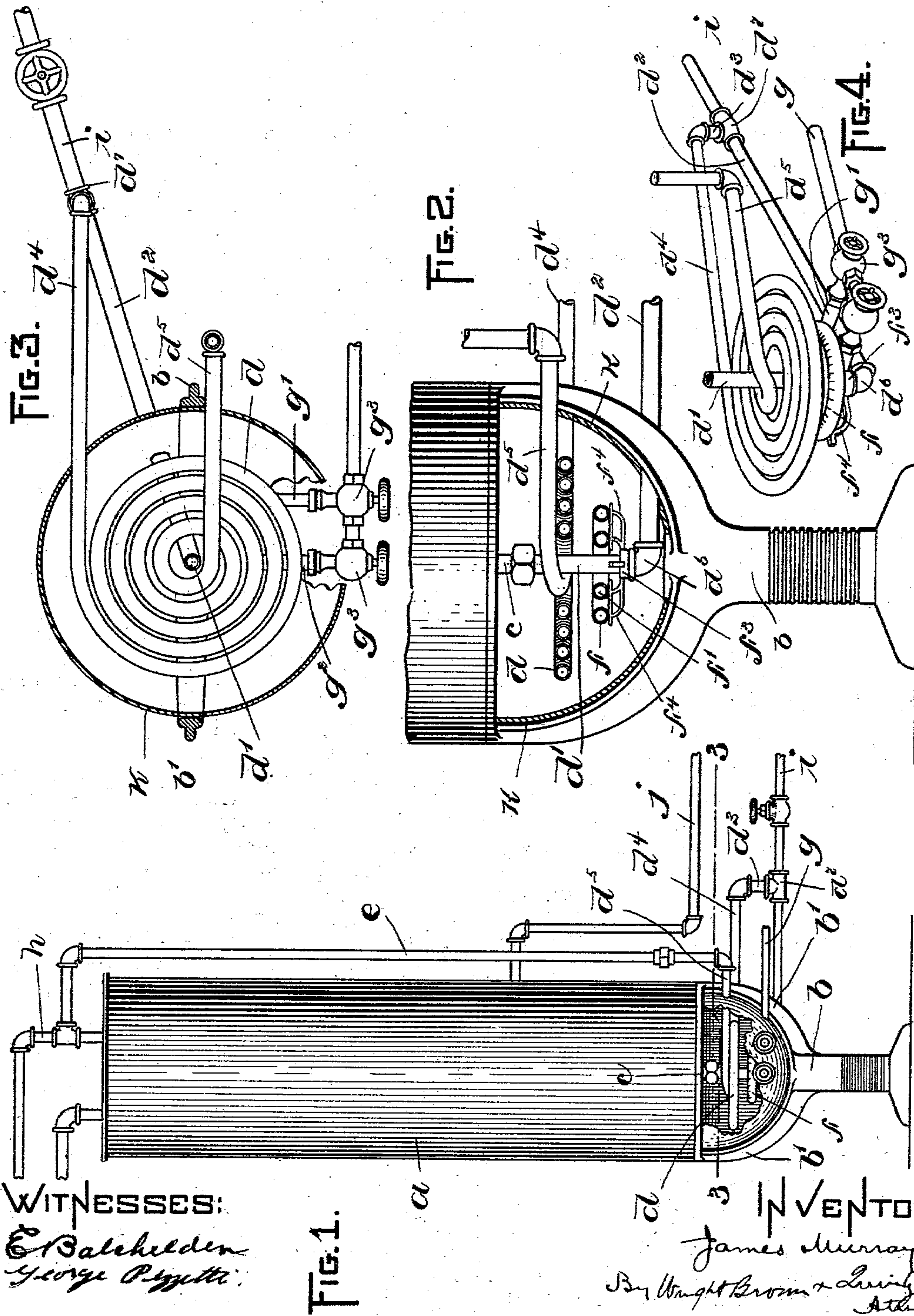
No. 694,775.

Patented Mar. 4, 1902.

J. MURRAY.  
WATER HEATING APPARATUS.

(Application filed July 10, 1901.)

(No Model.)





# UNITED STATES PATENT OFFICE.

JAMES MURRAY, OF BOSTON, MASSACHUSETTS.

## WATER-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 694,775, dated March 4, 1902.

Application filed July 10, 1901. Serial No. 67,715. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES MURRAY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Water-Heating Apparatus, of which the following is a specification.

This invention has for its object to provide a simple and effective apparatus adapted for use in connection with a hot-water reservoir such as is used in connection with kitchen-ranges, whereby water can be heated by an independent boiler when the range is not in use, so that hot water can be obtained at short notice in hot weather or at other times when there is no fire in the range.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a hot-water reservoir or "kitchen-boiler," so called, with my improved water-heating apparatus connected therewith. Fig. 2 represents an enlarged vertical section of the lower portion of the water-reservoir and the improved heating apparatus. Fig. 3 represents a section on line 3-3 of Fig. 2 and a plan view of the parts below said line. Fig. 4 represents a perspective view of my improved water-heating attachment disconnected from the water-reservoir.

The same reference characters indicate the same parts in all the figures.

In the drawings, *a* represents an ordinary hot-water reservoir or kitchen-boiler, and *b* represents the base or pedestal supporting the same, the pedestal and boiler being of the usual or any suitable construction, the pedestal having arms *b' b'*, secured to the bottom of the reservoir *a*. Between the arms *b' b'* is a space located below the bottom of the reservoir *a*, in which the different parts of my improved water-heating apparatus hereinafter described are located.

An ordinary hot-water reservoir *a* has extending downwardly from its bottom an outlet *c*, through which relatively cold water passes downwardly from the lower portion of the reservoir to the water back or front of the range, a suitable conducting-pipe being detachably connected to the outlet *c* by means

of a suitable union, said pipe constituting a connection between the outlet *c* and the water back or front of the range.

My improved water-heating attachment comprises, first, a water-circulating conduit composed of a spirally-coiled portion *d*, which is arranged in a substantially horizontal plane below the bottom of the reservoir *a*, a cold-water-conducting portion having a vertical section *d'*, extending through the coiled portion *d* and adapted at its upper end for connection with the reservoir-outlet *c*, and sections *d''*, *d'''*, and *d''''*, connected to each other and to the vertical section *d'*, as clearly shown in Fig. 4, the section *d''''* being a continuation of the outer convolution of the coiled portion *d*, and a hot-water-delivering portion comprising a section *d'''''*, constituting a continuation of the inner convolution of the coiled portion *d* and adapted at its outer end for connection with a vertical pipe or conduit section *e*, hereinafter referred to. The said water-heating apparatus also includes a burner located below the coiled portion *d* and adapted to heat the convolutions of the latter, said burner being preferably composed of two annular chambers *f f'*, each of which is provided in its upper portion with contracted slots or gas-outlets arranged to direct jets of burning gas upwardly toward the said convolutions. The chambers *f f'* of the burner are preferably supported by the elbow *d''*, which connects the sections *d'* and *d''*, above which surrounds the section *d'* and rests upon the elbow *d''*, and arms, *f''* extending from said collar to the burner-chambers. Said burner-chambers are supplied with gas by means of a main gas-pipe *g*, branch gas-pipes *g' g''*, connected therewith, there being one of said branch pipes for each burner-chamber and each provided with a suitable valve *g'''*.

The vertical pipe-section above referred to is extended upwardly beside the reservoir *a* and is connected at its upper end with the usual outflow or distributing conduit *h*, which conducts water from the upper portion of the reservoir *a* to the faucet supplied by the reservoir.

It will be seen that when the burner is lighted the coiled portion *d* of the circulating-conduit will be heated by the burner and a



circulation of water will be established, the water passing from the lower portion of the reservoir through the cold-water-conducting sections  $d'$   $d^2$   $d^3$   $d^4$ , while the heated water passes from the coiled portion  $d$  through the section  $d^5$  and pipe  $e$  to the distributing-conduit  $h$ . When a faucet supplied by the conduit  $h$  is open, the hot water will pass directly through the pipe-section  $e$  and conduit  $h$  to the open faucet without entering the reservoir; but when the faucets are closed the hot water passing through the pipe-section  $e$  will enter the upper portion of the reservoir and will be accumulated therein.

These sections  $d^2$  and  $d^3$  of the cold-water-conducting portion of the conduit may be connected by a T  $d^7$ , to which is also connected a pipe-section  $i$ , communicating with the water-back of the range, so that when the burner is not in use and the range is heated the water will be heated and circulated, as usual, the heated water passing from the water-back of the range through a conduit  $j$  (shown in Fig. 1) to the reservoir  $a$ .

It will be seen that my improved water-heating apparatus or attachment can be readily applied to and made a part of a water heating and circulating system, which includes the water-back of a range, so that the water may be heated and circulated either by the burner under the coiled portion  $d$  or by the fire in the range.

I prefer to provide a casing or shield  $k$ , of asbestos or other suitable material, said casing being formed to inclose the coiled portion  $d$  and the burner below the same. The said casing is formed to fit the inner sides of the arms  $b'$   $b'$  of the reservoir-supporting stand and may be made in the general form of a hollow hemisphere provided with an opening or recess to receive the central boss  $b^3$  between the arms  $b'$   $b'$ . Said casing is provided with suitable orifices for the conduit-sections  $d^3$   $d^4$   $d^5$ , the gas-pipe  $g$ , and the stems of the valves  $g^3$ . The coiled portion  $d$  is preferably made of copper tubing.

I claim—

1. The combination with a water-reservoir,

of a water-heater comprising a burner located below the bottom of the reservoir, and a water-circulating conduit comprising a coiled portion interposed between the burner and the bottom of the reservoir and adapted to be heated by the burner, a connection between one end of said coiled portion and the lower portion of the boiler, and connections between the other end of said coil and the upper portion of the boiler, and with a suitable water-delivering conduit, the said heater receiving water from the lower portion of the boiler, and supplying the same either to the top portion of the boiler or to the delivering-conduit.

2. A water-heating attachment comprising a burner, and a water-circulating conduit consisting of a coiled portion located above the burner and adapted to be heated thereby, a cold-water-conducting portion adapted for connection with a water-reservoir and extending vertically through the space surrounded by the coiled portion, and constituting a continuation of one of the convolutions of the coil, and a hot-water-conducting portion constituting a continuation of another convolution of the coil and a connection therefrom to a hot-water-delivering conduit.

3. A water-heating attachment comprising a burner, a water-circulating conduit consisting of a coiled portion located above the burner and adapted to be heated thereby, a cold-water-conducting portion adapted for connection with a water-reservoir and extending vertically through the space surrounded by the coiled portion, and constituting a continuation of one of the convolutions of the coil, and a hot-water-conducting portion constituting a continuation of another convolution of the coil and a connection therefrom to a hot-water-delivering conduit, the said burner being attached to the said cold-water-conducting portion below the coil.

In testimony whereof I have affixed my signature in presence of two witnesses.

JAMES MURRAY.

Witnesses:

THOMAS P. MAGEE,  
LESLIE M. SWETT.