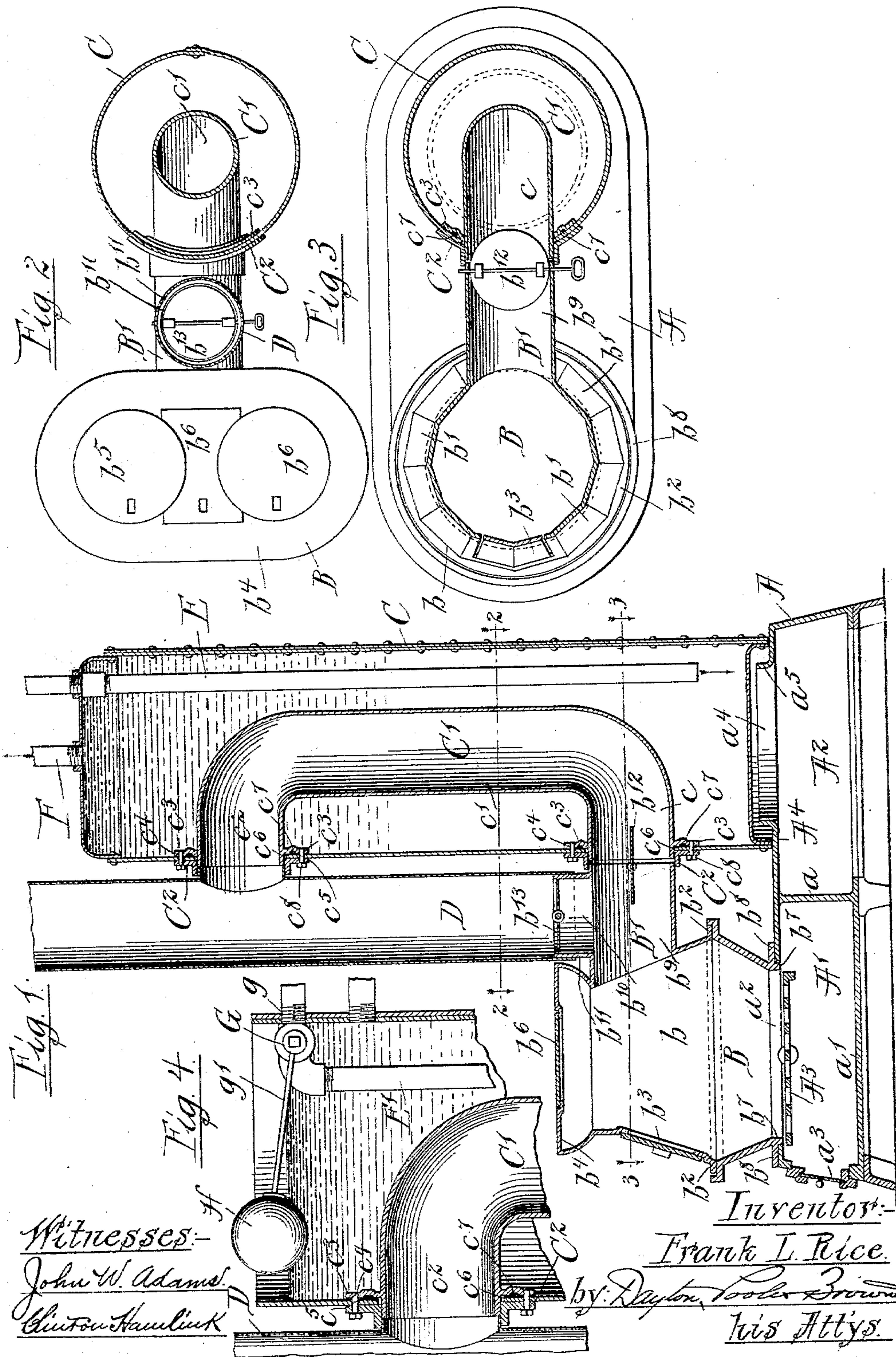


(No Model.)

F. L. RICE.  
COMBINED STOVE AND WATER HEATER.

No. 559,606.

Patented May 5, 1896.



Witnesses:-  
John W. Adams.  
Clinton Hamlin.

Inventor:-  
Frank L. Rice.  
by: Dayton, Pooler & Brown  
his Attys.



# UNITED STATES PATENT OFFICE.

FRANK L. RICE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE KEYSTONE  
HEATER COMPANY, OF SAME PLACE.

## COMBINED STOVE AND WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 559,606, dated May 5, 1896.

Application filed March 20, 1895. Serial No. 542,448. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK L. RICE, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful  
5 Improvements in a Combined Stove and Water-Heater; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of refer-  
10 ence marked thereon, which form a part of this specification.

This invention relates to improvements in a combined heating-stove and water-heater of that general class designed for domestic pur-  
15 poses.

More especially the invention relates to improvements in a stove and water-heater of the above character designed for use for laundry-work; but certain features of the invention  
20 are applicable to other uses also.

It has been the common practice heretofore to provide a supply of hot or warm water for domestic purposes by means of a reservoir or plumber's boiler located in the kitchen in the  
25 immediate vicinity of the kitchen-range, from which boiler a water-pipe is led to and connected with a heating-coil or "water-front" arranged within or adjacent to the fire-box of the range. Such an arrangement is conven-  
30 ient for kitchen purposes; but inasmuch as the laundry-room is usually located at some considerable distance from the kitchen, commonly in the basement of the house or in some outer building, it is very inconvenient or en-  
35 tirely impracticable to obtain hot water for laundry purposes from this source of supply. Furthermore, in order to heat the water sufficiently with the apparatus hereinbefore de-  
40 scribed it is necessary that a hot fire be maintained in the range for a considerable length of time, and this is usually at a time when the range is not required for kitchen use at all, or, in other words, a considerable  
45 amount of extra fuel must be burned in the range in order to heat water for the laundry. At the same time it is also necessary to maintain a second hot fire in a laundry-stove in the laundry in order to heat the flat-irons for ironing, inasmuch as it is entirely impracti-  
50 cable to heat the irons on the kitchen range.

In view therefore of the hereinbefore-de-

scribed inconveniences and lack of economy the present invention has for its objects, first, to provide a practical form of water-heater suitable for domestic and analogous uses by  
55 which a considerable quantity of water may be rapidly and economically heated; secondly, to combine such a water-heating apparatus with a heating-stove, (usually a laundry-stove and preferably upon a single base;) thirdly,  
60 to so arrange and construct the combined stove and water-heater that the former may, if desired, be used without bringing into use the water-heater, and, fourthly, to provide various improvements in the construction  
65 and arrangement of the several parts of the apparatus.

To the above ends the invention consists in the matters hereinafter described, and more particularly pointed out in the appended  
70 claims, and the same will be readily understood, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical sectional view of a combined laundry-stove and water-heater  
75 embodying my invention. Fig. 2 is a horizontal section of the same, taken on line 2 2 of Fig. 1 and looking downward. Fig. 3 is a similar section taken on line 3 3 of said Fig. 1 and looking downward. Fig. 4 is a sectional  
80 detail of the upper part of a reservoir embodying an additional feature of improvement.

Referring to said drawings, wherein my invention is shown as embodied in the form of  
85 a combined laundry-stove and water-heater, A designates as a whole a base of oblong form and of such length as to afford a suitable support for an upright heating-stove B at one end and an upright cylindrical reservoir or boiler  
90 C upon its other end. The base A may be of any desired form, may be made separable from both stove and boiler, or may be made in two independent sections, one supporting the stove and the other the boiler. As herein  
95 shown, however, and as preferably constructed, the front part A' of the base, or that part upon which the stove rests, is made to serve as an ash-box, being to this end separated from the rear part A<sup>2</sup> of the base by  
100 means of a transverse partition *a* and provided with an inclosing bottom *a'*, a grate-



opening  $a^2$ , and a door  $a^3$ . Within the grate-opening  $a^2$  is arranged a fire-grate  $A^3$ .

The stove proper is of the same general form as is common in stoves of this class, comprising an upright fire-box of general round form provided centrally of its height with a pyramidal portion  $b$ , having a plurality of sides  $b'$ , against which the irons may be placed to heat, an annular flange  $b^2$  for supporting the iron in position against said inclined sides of the stove, a fuel-door  $b^3$ , and a flat top  $b^4$ , provided with the usual pot-holes  $b^5$  and lids  $b^6$ . The stove as a whole is retained in proper position upon the base  $A$  and in register with the grate-opening by suitable retaining and supporting flanges  $b^7$   $b^8$ .

$B'$  designates an extension at the rear side of the stove, in which are formed the flue-openings thereof. The extension  $B'$  is of novel construction, being constructed to provide two exit-passages for the products of combustion, one,  $b^9$ , opening horizontally outward at the rear and the other,  $b^{10}$ , opening vertically upward. The latter opening  $b^{10}$  terminates in the usual annular flange  $b^{11}$  for the reception of the end of an ordinary stovepipe  $D$ . Each of the exit-passages  $b^9$   $b^{10}$  is provided with a damper or valve  $b^{12}$   $b^{13}$ , respectively, by means of which it may be closed.

Next describing the water-heating reservoir or boiler  $C$ , this is preferably, although not necessarily, cylindrical and of the same general form exteriorly as an ordinary plumber's boiler and is supported upon the base  $A$  immediately in rear of the stove.

$C'$  designates a deflecting-flue preferably arranged entirely within the body of the boiler  $C$ , so as to be completely surrounded or submerged by water when the boiler is in use. Said flue is herein shown as of the same area in cross-section as the exit-opening  $b^9$  and as comprising a horizontally-directed intaking portion  $c$ , arranged to register with the said exit-opening  $b^9$ , an ascending portion  $c'$ , which extends to the upper part of the boiler and is then deflected outwardly, as at  $c^2$ , and extended out through the side of the boiler. The exit end of the flue  $c^2$  is connected with the stovepipe  $D$  by means of a T-joint, thus forming a continuous deflecting-flue, through which the products of combustion may be diverted by properly turning the dampers  $b^{11}$  and  $b^{12}$ .

It will of course be understood that the details of construction of the reservoir or boiler  $C$  and deflecting-flue therein may be varied; but I have herein shown what I deem a very practical and preferred form of construction, which is as follows:

The boiler proper is formed by bending a suitable rectangular sheet of metal provided with suitable holes for the reception of the ends of the flue into cylindrical form, overlapping and riveting together the meeting edges and thereafter riveting in or otherwise securing a suitable cap at the upper end in practically the same way that an ordinary

plumber's boiler is made. The deflecting-flue is conveniently, and as herein shown, formed by casting and is provided near each end with an exterior radially-extending securing-flange  $c^3$ , provided with a series of bolt or rivet holes  $c^4$ , which are arranged to register with corresponding apertures  $c^5$ , formed in the margins of the flue-aperture  $c^6$  in the side of the boiler. Within the contacting face of each flange  $c^3$  is formed an annular groove for the reception of packing, which is interposed between the said flanges and the inside of the boiler.

$C^2$   $C^2$  designate washers of proper size to fit upon the ends of the flue  $C$ , being L-shaped in cross-section, curved to conform to the cylindrical exterior of the boiler, and provided with bolt or rivet apertures adapted to register with those of the flanges  $c^3$ .

The several parts thus constructed are assembled by placing the flue bodily within the boiler and passing its respective ends out through the holes  $c^6$  as far as permitted by the flanges  $c^3$ , a ring  $c^7$  of suitable packing material being interposed between each flange and the inside of the boiler. The washers  $C'$   $C'$  are next placed upon the protruding ends of the flue and securing-bolts  $c^8$  or rivets passed through the three parts and properly tightened up, thus securing the flue rigidly in position and at the same time forming a water-tight joint around the latter.

A suitable supply-pipe  $E$  is provided, being preferably arranged to enter at the upper end of the reservoir and to extend downward within the latter to a point near the bottom. An outlet pipe or tap  $F$  is also provided, located at any desired point, but preferably, and as herein shown, at some distance above the bottom of the boiler. After these several parts have been put in place the bottom is inserted and riveted in in the usual manner.

As before stated, the stove and boiler are both supported upon one common base, and that part of the base forming the support for the reservoir is of novel construction, as will now be described.

The part  $A^2$  of the base is somewhat larger in area than the bottom of the reservoir, constructed to support the latter at a considerable distance above the floor, and is hollow, so as to provide an open space directly beneath the reservoir. In the top plate  $A^4$  of the base is formed a circular opening  $a^4$ , somewhat less in diameter than the bottom of the reservoir and located centrally beneath the latter. Preferably this circular opening will be surrounded by an upturned retaining-flange  $a^5$ . The object of making the opening  $a^4$  smaller than the bottom of the reservoir and providing the retaining-flange  $a^5$  is in order that the reservoir may be moved away from the stove, if desired, without removing it from the base.

The construction of the part  $A^2$  of the base hereinbefore described enables any ordinary small gas or oil burner to be used to heat the water in the reservoir when it is desired to



use the latter independently of or without using the stove.

The use of the apparatus is obvious and need not be particularly described.

5 By properly manipulating the dampers the stove may be used independently of the reservoir, thus giving a more direct draft, or the products of combustion may be directed through the deflecting-flue and thus caused to  
10 heat the liquid therein very rapidly and to the desired degree.

In Fig. 4 is shown the upper portion of a modified form of reservoir and supply and tap pipes. The supply-pipe E' is in this in-  
15 stance provided with an automatic governing-valve G, actuated by a float H, by which the water in the reservoir is prevented from rising above a certain height. The valve G comprises a rotatable stopper or plug arranged  
20 transversely within the pipe E' and provided with a passage which permits the flow of water therethrough or not, dependent upon the position of the valve. One end of said stopper protrudes through the side of the pipe, as  
25 at g, and with this is connected a rigid arm g', carrying at its end the float H. When the water rises above a certain point, the float, rising therewith, turns the stopper and closes the passage therethrough. Upon drawing  
30 water from the reservoir this action is reversed and water permitted to flow in to replace that drawn off.

While I have herein described what I consider a preferred form of embodying my in-  
35 vention, yet it will be obvious that various changes may be made in the details thereof without departing from the spirit of the invention or involving more than ordinary mechanical skill. I do not, therefore, desire to  
40 be limited to the precise details set forth herein except as claimed.

What I claim, and desire to secure by Letters Patent, is as follows:

1. As a new article of manufacture, a unit-  
45 ary structure comprising a heating-stove and an independent, automatically-fed water-reservoir having an internal flue, and means for directing the products of combustion from the stove into and through said flue when desired,  
50 substantially as described.

2. As a new article of manufacture, a unit-  
ary structure comprising a stove provided with a pipe for carrying off the products of combustion, and an independent, automat-  
55 ically-fed water-reservoir provided with an internal flue, the latter communicating at one end with the stovepipe and communicating at the other end with the combustion-chamber of the stove, and means for closing the  
60 opening into the said pipe and thereby deflecting the products of combustion therefrom into said flue when desired, substantially as described.

3. The combination with a stove having a  
65 two-way opening for the exit of the products of combustion therethrough, a damper to con-

trol each way and a smoke-pipe connected with one way, of an independent water-reservoir having an interior flue or conduit one end of which opens through the walls thereof  
70 in communication with the other way and having its other end in communication with the smoke-pipe at a remove from said two-way opening, substantially as described.

4. The combination with a heating-stove  
75 and an independent water-reservoir, of a flue extending through the latter and communicating at one end with the combustion-chamber of the former, a base or support common to both stove and reservoir, and means for  
80 directing all the products of combustion from the stove through said flue when desired, substantially as described.

5. The combination with a stove provided at one side with two exit-openings for the  
85 products of combustion, one extending vertically and the other horizontally, and a smoke-pipe connected with the former, of a cylindrical independent water-reservoir arranged adjacent to the stove, a deflecting-flue  
90 vertically arranged within said reservoir having end portions extending through the side walls of the reservoir, the lower end of said flue being connected with the horizontal opening of the stove and the upper end thereof  
95 communicating with the smoke-pipe and a damper arranged to control each of said exit-openings, substantially as set forth.

6. The combination with a heating-stove, of an independently-operating water-reser-  
100 voir, and a base for supporting both stove and reservoir adjacent to each other, that part of the base supporting the reservoir being made of skeleton form and provided with an opening substantially beneath the reservoir for the  
105 purpose of exposing the greater part of the bottom thereof, substantially as set forth.

7. The combination with a reservoir and a flue arranged within the reservoir and open-  
ing at its ends through the side of the latter,  
110 of means for forming a rigid and water-tight union at the juncture of the end of the flue with the reservoir comprising a radially-disposed flange provided around the flue near the end thereof, a packing-groove in the face  
115 of said flange, a washer, L-shaped in cross-section, adapted to fit around the end of the flue exterior to the reservoir and adapted to receive the end of a pipe to register with said flue and securing-bolts extending through  
120 said washer, the wall of the tank and the flange, substantially as set forth.

8. The combination with a reservoir and a flue arranged within the reservoir and open-  
ing at its ends through the walls of the lat-  
125 ter, of means for forming a rigid and air-tight union where said flue passes through said walls, comprising a radially-disposed flange provided on the flue near the end thereof, and an annular flanged washer adapted to fit  
130 around the end of said flue exterior to the reservoir, a pipe adapted to enter or fit over



the washer-flange and to register with said  
flue, and means for securing said washer and  
flue-flange and for securing the wall of the  
reservoir between said washer and said flue-  
5 flange comprising a bolt extending through  
apertures in the flange, reservoir and washer,  
substantially as set forth.

In testimony that I claim the foregoing as  
my invention I affix my signature in presence  
of two witnesses.

FRANK L. RICE.

Witnesses:

TAYLOR E. BROWN,

ALBERT H. GRAVES.