

H. EISENACH & W. F. SMITH.
SAFETY VALVE FOR WATER HEATERS.
APPLICATION FILED DEC. 11, 1911.

1,045,007.

Patented Nov. 19, 1912.

2 SHEETS—SHEET 1.

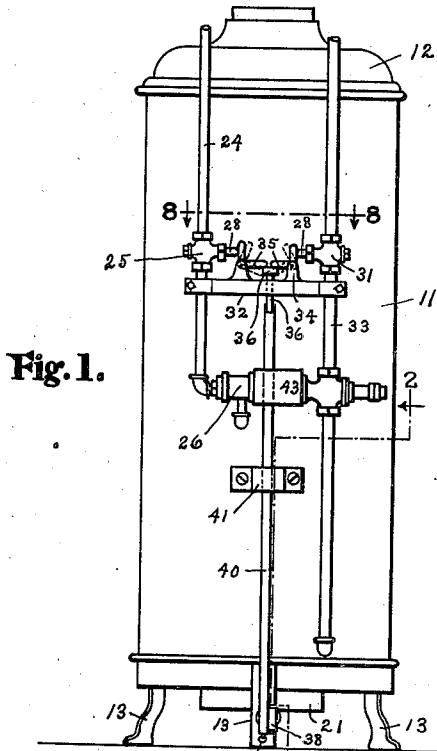


Fig. 1.

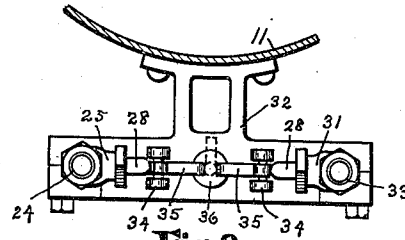


Fig. 8.

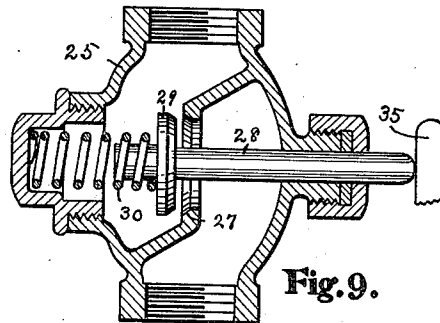


Fig. 9.

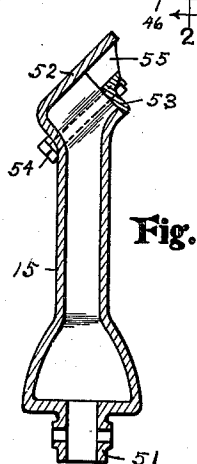


Fig. 10.

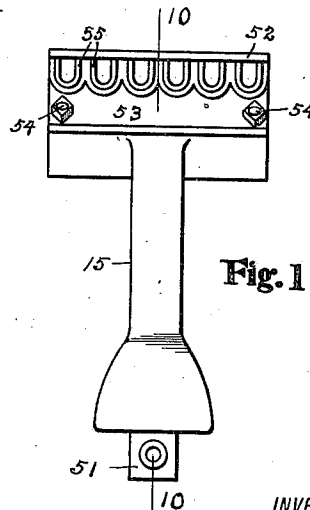


Fig. 11.

WITNESSES:

Albert A. Hoffmann.

Hugo W. Kreinbring.

INVENTORS

Henry Eisenach & William F. Smith.

BY

Edward N. Pagelsen

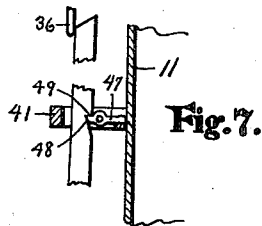
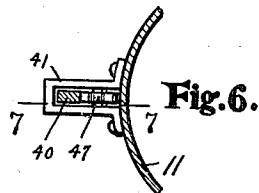
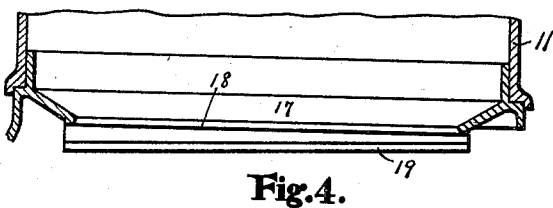
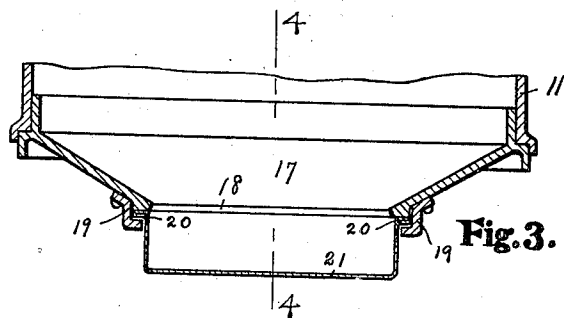
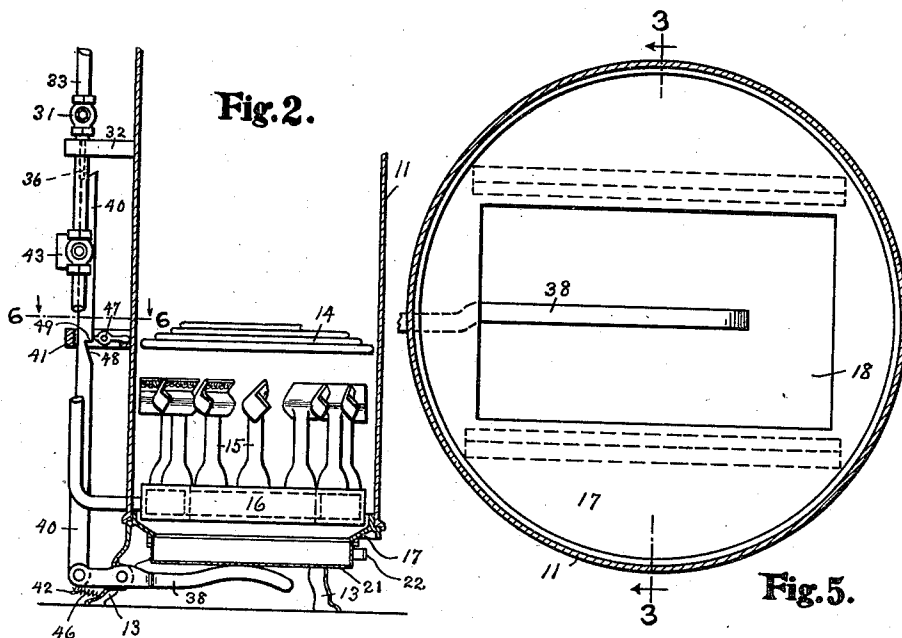
ATTORNEY

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ATTORNEY

UNITED STATES PATENT OFFICE.

HENRY EISENACH AND WILLIAM F. SMITH, OF DETROIT, MICHIGAN.

SAFETY-VALVE FOR WATER-HEATERS.

1,045,007.

Specification of Letters Patent.

Patented Nov. 19, 1912.

Application filed December 11, 1911. Serial No. 664,962.

To all whom it may concern:

Be it known that we, HENRY EISENACH and WILLIAM F. SMITH, citizens of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Safety-Valve for Water-Heaters, of which the following is a specification.

This invention relates to means for automatically shutting off the gas or water, or both, from any type of water-heaters to prevent damages in case the heating coil or other container springs a leak or becomes injured in any other way; and its object is to provide a simple and effective device for cutting off the supply of gas or water or both, which device may be connected to any type of water-heater and which shall be controlled by the water escaping from the heating coils, or which is deposited on the container and drips from the same.

This invention consists in combination with valves in the water and gas supply-pipes, of novel means for keeping these valves open, and novel means for supporting a drip-pan underneath the burners of the water-heater which means shall be so constructed that any excess of water in the drip-pan will cause the closing of the control valves.

In the accompanying drawings Figure 1 is an elevation of the heater showing this safety device connected thereto. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a section on the line 3—3 of Fig. 5. Fig. 4 is a section on the line 4—4 of Fig. 3. Fig. 5 is a plan of the heater below the burner with the drip-pan omitted. Fig. 6 is a section on the line 6—6 of Fig. 2. Fig. 7 is a section on the line 7—7 of Fig. 6. Fig. 8 is a section on the line 8—8 of Fig. 1. Fig. 9 is a section of one of the control valves. Fig. 10 is a section on the line 10—10 of Fig. 11. Fig. 11 is a front elevation of a burner.

Similar reference characters refer to like parts throughout the several views.

Water-heaters, both automatic and ordinary, usually consist of a case in which coils or other receptacles for water, and the burners are mounted. These coils or other receptacles sometimes spring a leak or become broken, whereupon the water flows down onto the burners and extinguishes them. As a result, gas pours into the house, endangering the lives of the occupants, and

where this does not occur, the water from the coils often injures or destroys property. This present invention is designed to prevent such injury by cutting off the supply of both water and gas, or either of them as desired, immediately upon the leak in the coils or other receptacle becoming sufficiently large to permit the passage of more water than will be immediately evaporated by the burners.

In the accompanying drawings 11 is the case of a heater having top 12 and legs 13. Within the heater are the coils 14 or other receptacles for the water, the burners 15, and the burner-ring 16. Secured in the lower end of the shell 11, in any desired manner, is a bottom 17 having a central aperture 18. This bottom may be of any desired construction and form. In Figs. 3 and 4 this bottom 17 is shown provided with guides 19, which receive the flanges 20 on the drip-pan 21. These guides 19 slope down toward the rear, or to the left in Fig. 4, so that the front end of the drip-pan will always be at the same height, while the rear end may have vertical movement. The pan may be of any desired material and construction, preferably rectangular, and may have any desired handle 22.

The water-pipe 24 extends down to the shut-off valve 25 and then connects to the water-chamber 26 of any desired automatic control mechanism 43. In the drawings a valve mechanism such as shown in the Buerkle Patent No. 591,588, dated Oct. 12th, 1897, is indicated conventionally. It is to be understood, however, that this automatic control mechanism may be omitted if desired, for the present invention can be employed with any other desired type of automatic controller and with water-heaters which have no automatic control mechanism of any kind.

The shut-off valve 25 is shown in section in Fig. 9, and has a seat 27, a stem 28, a valve-disk 29 and a spring 30 adapted to force the disk onto its seat. The gas shut-off valve 31 is of similar construction. Just below these valves is a bracket 32 which may be secured to the shell 11 or merely secured to the water-pipe 24 and gas-pipe 33. On the bracket are two pedestals 34 which carry pivots for the bell-crank levers 35. A small pin 36 extends down through a hole in the bracket and has a head 37 which is under the

lower arms of the bell-crank levers. The upper arms of these levers are in engagement with the stems 28 of the valves.

Pivoted on a leg 13, or on any other desired support, is a lever 38, which extends below the opening 18 in the bottom 17. The outer arm of this lever connects to the bar 40 which is guided by the bracket 41. The pin 36 normally rests on the inclined upper end of this bar. At the lower end of this bar is a small finger 42, to which a spring 46 connects and normally holds the upper end of the bar outward. In the bracket 41 is pivoted a dog 47 which is normally horizontal and holds the bar 40 outward. The bar has a notch 48.

The operation of this device is as follows: When the parts are in the positions shown in Fig. 2, the valve-disks 29 will be held from their seats and gas and water will flow through the pipes in the usual manner. The weight of the drip-pan 21 and its contents will be counterbalanced by the bar 40, and the dog 47 will hold the upper end of the bar below the pin 36, as shown in Fig. 2. As soon as an unusual amount of water collects in the drip-pan, its rear end will move down, carrying with it the lever 38, whose outer end will lift the bar 40. Until the shoulder 49 on this bar passes the dog 47, as shown in Fig. 7, there will be no effect, for the additional inward movement of the stems 28 of the valves will merely compress the springs 30 slightly more. But as soon as the shoulder 49 passes the dog 47, the pressure of the springs 30 on the stems and bell-crank levers, and the resultant pressure of the pin 36 on the inclined upper end of the bar 40, forces the upper end of the bar inward so that the pin 36 slips off its upper end, as shown in Fig. 7. As the pin slips off the end of the bar, the springs 30 force the disks 29 to their seats, thus cutting off the supply of both water and gas. It will be understood that either the gas or the water-pipe and its valve may be omitted and this mechanism employed to control the remaining valve.

The burners preferred for this construction are shown in Figs. 2, 10 and 11, and comprise the bodies 15 having projections 51 adapted to enter the burner-ring 16. The upper end of each burner is formed with a flat inclined hood 52, beneath which may be secured the plate 53 by means of the bolts 54. This plate is provided with a series of nozzles 55 which cause the gas to flow out of the burner in a series of parallel streams, so that a full supply of air can easily reach each particle of gas. These burners may be arranged in any desired manner, but the preferred manner is shown in Fig. 2, where they are so placed that the jets of gas from each burner pass over the hood of the burner just forward of it.

Many changes in the details of construction can be made by those skilled in the art without departing from the spirit of this invention.

It will be understood that when an excess of water is deposited on the container and drips down into the receptacle, this mechanism will act as an alarm and safety device before the receptacle overflows.

We claim.

1. In a water heater, the combination of a shell, a container for water therein, a receptacle below said container to receive such water as may escape from the container, a pipe to supply water to said container, a cut-off valve in said pipe, and means operatively connecting said receptacle and valve whereby the valve is permitted to close when said receptacle contains a predetermined amount of water.

2. In a water heater, the combination of a container for water, a receptacle below said container to receive such water as may escape from the container, a pipe to supply water to the container, a valve to control the flow of water through the pipe, means to close said valve, and means connected to said receptacle to hold the valve open until said receptacle contains a predetermined amount of water.

3. In a water heater, the combination of a container for water, a burner to heat said water, a pipe to supply gas thereto, a receptacle below said container to receive such water as may escape from said container, a valve to control the flow of gas through said pipe, means to close the valve, and means connected to said receptacle to hold the valve open until said receptacle contains a predetermined amount of water.

4. In a water heater, the combination of a container for water, a burner to heat said water, a pipe to conduct water to said container and a pipe to conduct gas to the burner, a self-closing valve in each pipe, a receptacle below the container to receive such water as may escape from the container, and means connected to said receptacle to hold the valve open until said receptacle contains a predetermined amount of water.

5. In a water heater, the combination of a container for water, a burner to heat said water, a pipe to conduct gas to said burner, a self-closing cut-off valve in said pipe, a pan to receive the water which may escape from said container, a lever to support the pan, a bar connected to said lever, and mechanism connecting to said bar whereby said valve is held open until the weight of the water in the receptacle actuates said bar and mechanism to release the valve and permit it to close.

6. In a water heater, the combination of a container for water, a burner to heat said

water, a pipe to conduct gas to said burner, a receptacle below the container to receive the water which may escape therefrom, and means connected to the receptacle whereby the flow of gas through said pipe is controlled.

7. In a water heater, the combination of a container for water, a burner to heat said water, a pipe to conduct water to said container, a receptacle below the container to receive the water which may escape therefrom, and means connected to said receptacle to stop the flow of water to the container when the contents of the receptacle exceeds a predetermined amount.

8. In a water heater, the combination of a container for water, a burner to heat said water, a pipe to conduct gas to said burner and a second pipe to conduct water to said container, a receptacle mounted below the container to receive the water which may escape therefrom, and means whereby the position of the receptacle controls the flow of gas and water.

9. In a water heater, the combination of a container for water, a burner to heat said water, a pipe to conduct gas to said burner and a second pipe to conduct water to said container, a self-closing valve in each pipe, a lever to hold each valve open, a vertically-slidable pin engaging said levers, a bar engaging said pin to hold the valves open, a dog to normally hold the bar in the path of said pin, said bar having a notch which said dog may enter and permit the bar to swing out of the path of the pin, a lever

pivoted at the lower end of the heater, said bar connecting to one end of the lever, and a receptacle below the water container to receive the water which may escape therefrom, said receptacle engaging the other end of said lever so that an excess of water in said receptacle will carry the notch in said bar into line with said dog and thus release said valves.

10. In a water heater, the combination of a container for water, a receptacle below the container, a pipe to supply water to the container, a valve to control the flow of water through the pipe, and means connected to the receptacle to cause the closing of the valve when said receptacle contains more than a predetermined amount of water.

11. In a water heater, the combination of a container for water, a receptacle below the container, a burner below the container, a pipe to supply gas to the burner, a valve to control the flow of gas through said pipe, and means connected to the receptacle to cause the closing of the valve when said receptacle contains more than a predetermined amount of water.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

HENRY EISENACH.
WILLIAM F. SMITH.

Witnesses:

EDWARD N. PAGELSEN,
JOHN D. HARGER.

It is hereby certified that in Letters Patent No. 1,045,007, granted November 19, 1912, upon the application of Henry Eisenach and William F. Smith, of Detroit, Michigan, for an improvement in "Safety-Valves for Water-Heaters," an error appears in the printed specification requiring correction as follows: Page 3, line 39, for the word "bater" read *water*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 31st day of December, A. D., 1912.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.