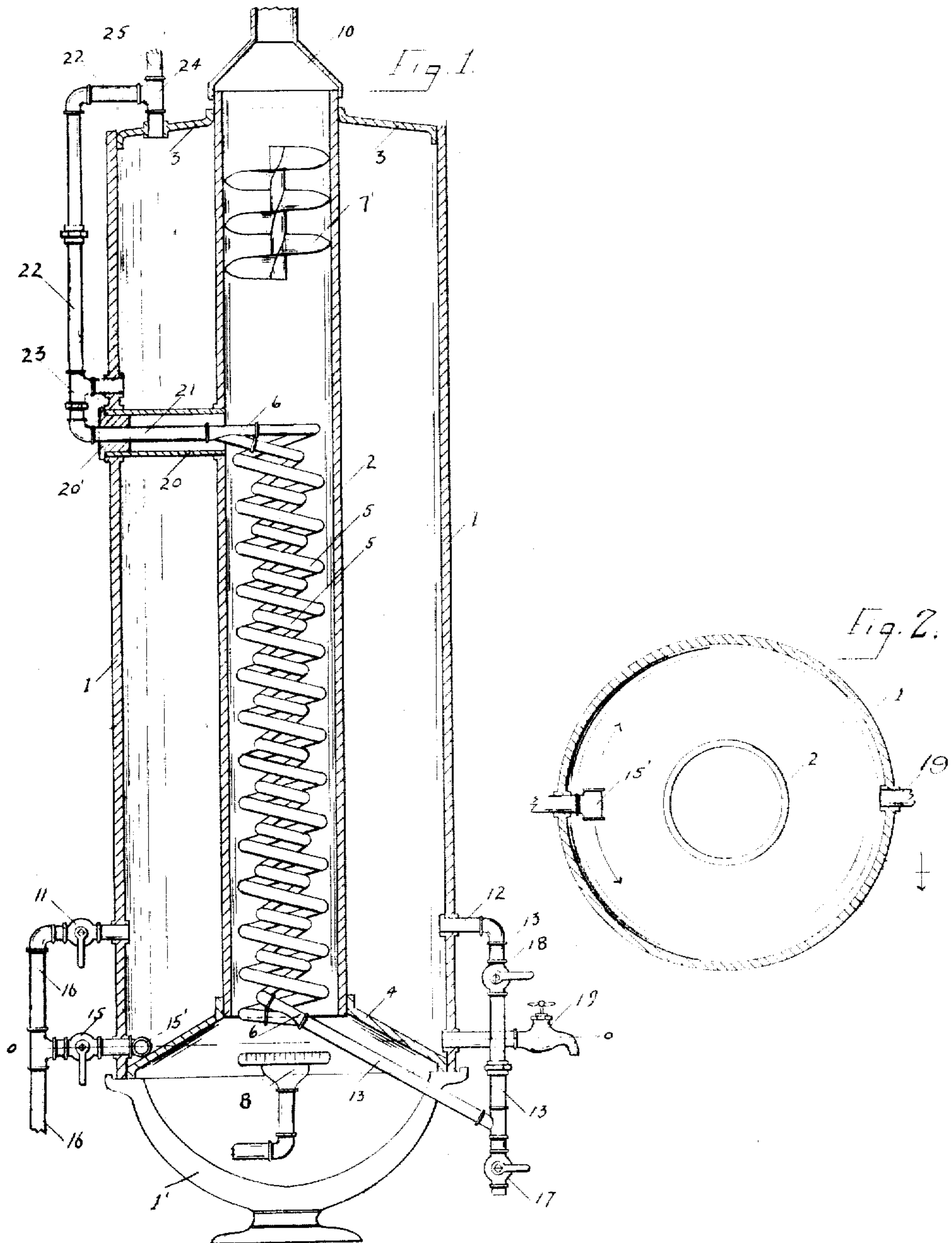


E. W. SAWTELLE.  
WATER HEATER.  
APPLICATION FILED MAR. 10, 1909.

950,516.

Patented Mar. 1, 1910.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

EUGENE WILLIAM SAWTELLE, OF SACRAMENTO, CALIFORNIA.

## WATER-HEATER.

950,516.

Specification of Letters Patent.

Patented Mar. 1, 1910.

Application filed March 10, 1909. Serial No. 482,627.

*To all whom it may concern:*

Be it known that I, EUGENE WILLIAM SAWTELLE, a citizen of the United States, residing at Sacramento, in the county of Sacramento and State of California, have invented certain new and useful Improvements in Water-Heaters, of which the following is a specification.

My invention relates to improvements in water heaters and especially to that class used for heating a supply of water for domestic purposes by means of gas; and the objects of my invention, among others which will become apparent, are to provide a heater from which the settlements of water charged with sediment may readily be removed not only from the tank but also from the coils; to provide an arrangement of heating coils that will supply the maximum amount of hot water with the minimum expenditure of gas, and to provide certain novel arrangements of pipes and connections as will be further explained.

A practical embodiment of my invention is represented in the accompanying drawings forming part of this specification, in which similar figures of reference indicate corresponding parts throughout.

The specification is in such clear and concise terms that anyone familiar with the art to which this invention applies may readily understand it and be able to construct the same, reference being also had to the drawings.

Figure 1 is a vertical sectional view showing certain parts in side elevation of the water heater forming the basis of my invention. Fig. 2 is a sectional view taken at the dotted line *o—o* of Fig. 1 to show the T 15' and the outlet 19.

In Fig. 1, 1' is a stand for supporting the boiler; 1 is the outer shell of the boiler; 2 is an open ended central tube or flue concentric with the shell, the upper end of which terminates in the head 3 and the lower end terminates in the frusto-conical bottom 4; 5—5 is a double spiral water heating coil vertically arranged within the flue 2, the terminals of said coil connecting with Y's 6—6.

8 is a gas burner located below the coils and 10 is a chimney for conveying off any gas or fumes.

The water supply is admitted into the tank through the cock 11 situated near the lower part of the tank; about on a level

with this and at any point in the periphery of the tank but preferably opposite to it, is a pipe connection 12 which conducts the water near the lower part of the boiler to the lower end of the coil 5 through the pipes 13 and 13' and their auxiliary connections. At the lowest point on the pipes 13 and 13' is a drain cock 17 and between this cock and the connection 12 is a stopcock 18. When it is desired to clear the coil of any sediment, the cock 18 is shut off and the cock 17 opened, it being understood that the supply-cock 11 is also open.

At the lowest practical point in the tank is placed a cock 15 supplied from the main pipe 16 as indicated, and within the tank and connected to said cock by suitable fittings is a T 15' so placed that when the cock 15 is opened (the cock 11 now being closed) the stream of water will be divided, part going around the bottom of the tank one way and part the other, see Fig. 2. It is obvious that when the drain-cock 19 is opened, any deposit or settlements which may have collected in the pocket formed by the union of the sides of the tank and the frusto-conical bottom will be washed out. When it is desired to clear the bottom of the boiler, the cock 11 should be closed, and the two cocks 15 and 19 opened. The supply cock 11 is placed above the cock 15 so that as the fresh supply of water is injected into the tank it will not agitate any settlements or deposits therein. By this arrangement of drains it is possible to keep the tank and coils free from settlements which have proven so disastrous in certain parts of the country to water heaters of this class.

Near the upper end of the tank is a sleeve 20 connecting the outer shell of the boiler with the flue 2; this sleeve is to form a passage-way for the introduction of the pipe 21 connecting the upper discharge end of the coils 5 with the pipe 22. The outer end of this sleeve is plugged by the bushing 20'. In the lower part of this pipe 22 is placed a T 23 with suitable connection to the tank, and the upper end of 22 is connected by another T 24 to the upper head 3 of the tank; and the hot water delivery pipe 25 is connected to this T, all as indicated.

The operation will then be as follows: Water passing through the pipes 13 and 13' (the cock 18 being open) will enter the lower end of the coil 5 and become instantly heated, and rising, will pass into the general cir-



culation of the tank through the T's 23 and  
 24 and their connecting pipes 21 and 22,  
 tending to heat the entire contents of the  
 tank quickly. When the hot water delivery  
 5 pipe 25 is opened by means of a valve con-  
 nected with the hot water delivery service,  
 the hot water in the coils will be delivered  
 first, passing directly through the pipes 21,  
 22 and 25 and afterward the water in the  
 10 upper end of the tank will pass out through  
 the T's 24 and 23. With this simple ar-  
 rangement of pipes, it is possible to obtain  
 a quantity of hot water quickly or a larger  
 supply in a short period of time. But in  
 15 order that the proper circulation of water  
 may be carried on in the tank and coils, it  
 is necessary that they be kept free from  
 settleings which form when the water supply  
 is charged with considerable sediment. If  
 20 the tank is not in constant use, sediment will  
 collect in the coils and bottom of tank, and  
 when heat is applied will cause the sediment  
 to harden and thus obstruct the proper pas-  
 sage of water. Should this continue, the  
 25 pipes may become completely closed, thus  
 causing considerable damage; this condition  
 is overcome by the system of drain cocks  
 and valves hereinbefore fully explained.

While I have shown and described a  
 30 frusto-conical bottom boiler, I do not wish  
 to claim such broadly, as the arrangement  
 I have shown can be used equally well with  
 a flat bottom boiler when the distance be-  
 tween the shell and the inner flue is not very  
 35 great. The drawings show a double spiral  
 water coil; this may be a single coil but I  
 prefer to use the double coil as it exposes  
 a greater surface to the action of the heat.  
 It is, therefore, to be noted that various  
 40 changes may be made in the form, propor-  
 tion and minor details of construction with-  
 out in any way departing from the principle  
 or sacrificing any of the advantages of this  
 invention.

45 I am aware that water heaters having heat-  
 ing coils is not new, but

What I claim as new and desire by Let-  
 ters Patent to secure, is—

1. In a water-heater suitably supported,  
 50 the combination of a tank having an upper  
 head and a frusto-conical bottom and an open  
 ended inner flue concentrically fixed therein,  
 one end terminating in the upper head and  
 the other in the frusto-conical bottom, and  
 55 having a sleeve connecting the outer shell of  
 said tank near its upper end with the above

mentioned flue; a coil vertically disposed  
 within said flue; a pipe leading from the  
 bottom of said coil around the lower part  
 of the tank and connected to the tank on the  
 60 outside near its lower end; a pipe leading  
 from the upper end of the aforesaid coil  
 through the hereinbefore mentioned sleeve;  
 a T connecting this last mentioned pipe to  
 the tank on the outside just above the sleeve;  
 65 a continuation of this same pipe and a sec-  
 ond T connecting the same to the head of  
 the tank; a hot-water delivery pipe connect-  
 ed to this last mentioned T; a cold-water  
 supply pipe connected to the tank at two  
 70 points, the one above the other, near the bot-  
 tom thereof; and a gas burner located below  
 the water coil.

2. In a water heater suitably supported  
 and having a drain-cock 19, the combination  
 75 of a tank having an upper head and a frusto-  
 conical bottom and an open ended inner flue  
 concentrically fixed therein, one end termi-  
 nating in the upper head and the other in  
 the frusto-conical bottom, and having a  
 80 sleeve connecting the outer shell of said  
 tank near its upper end with the above men-  
 tioned flue; a coil vertically disposed within  
 said flue; a pipe leading from the bottom of  
 said coil around the lower part of the tank  
 85 and connected to the tank on the out-  
 side near its lower end, said pipe being pro-  
 vided with a drain cock 17 and a stop cock  
 18; a pipe leading from the upper end of  
 the aforesaid coil through the hereinbefore  
 90 mentioned sleeve; a T connecting this last  
 mentioned pipe to the tank on the outside  
 just above the sleeve; a continuation of this  
 same pipe and a second T connecting the  
 same to the head of the tank; a hot-water  
 95 delivery pipe connected to this last men-  
 tioned T; a cold-water supply pipe 16 con-  
 nected to said tank at two points, the one  
 above the other, near the bottom thereof, the  
 upper connection being provided with a stop-  
 100 cock 11 and the lower connection being pro-  
 vided with a stop-cock 15 and terminating  
 within the tank in a T 15'; and a gas burner  
 located below the water coil.

In testimony whereof I have signed my  
 105 name to this specification in the presence of  
 two subscribing witnesses.

EUGENE WILLIAM SAWTELLE.

Witnesses:

J. C. CARPENTER,  
 E. A. STICKNEY.