Nov. 4, 1930. L. B. HYDE 1,780,426

HOT WATER HEATER

Filed April 8, 1929

Fig. 1.

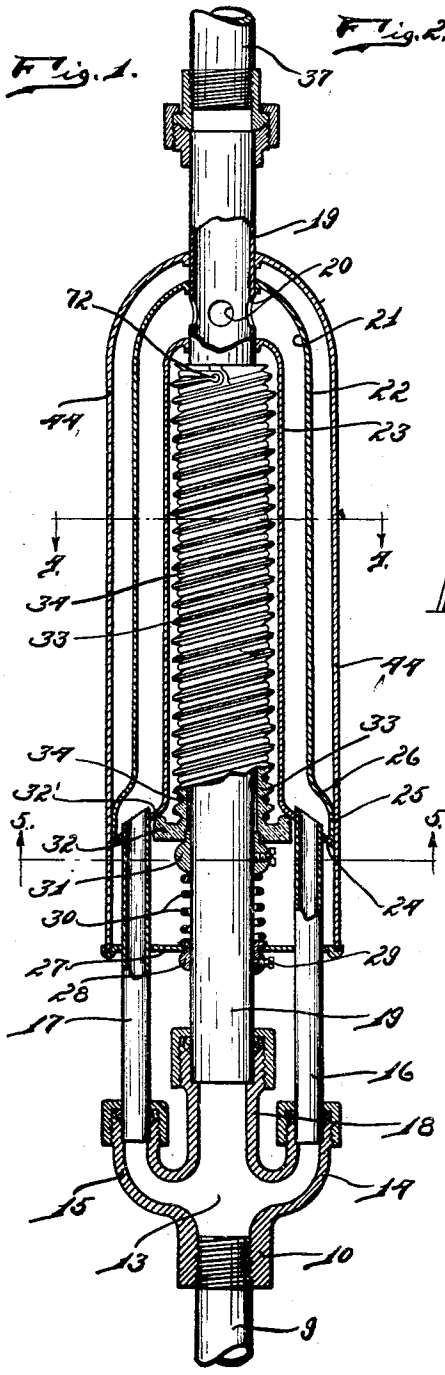



Fig. 2.

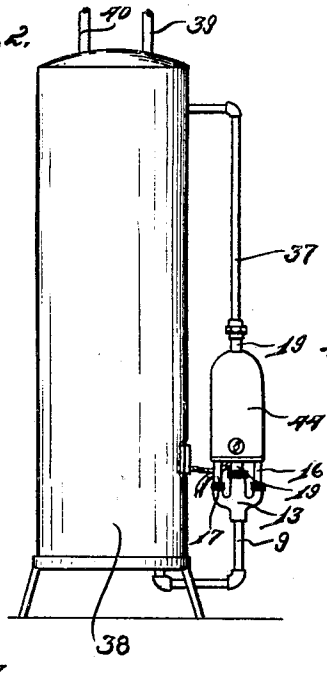



Fig. 3.

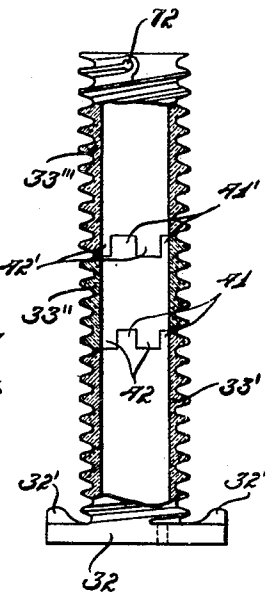



Fig. 4.

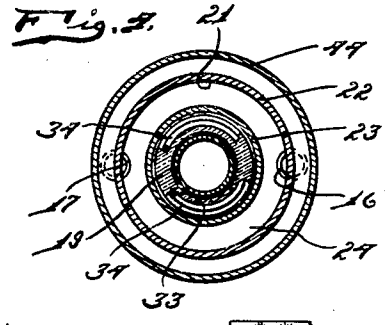
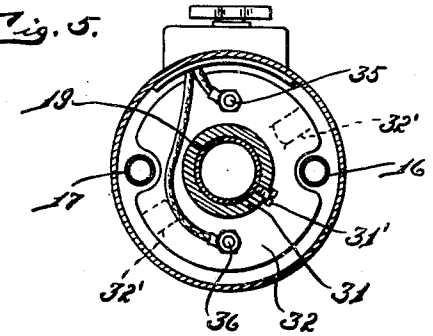



Fig. 5.




INVENTOR.
Louis B. Hyde.

BY

ATTORNEY.

Patented Nov. 4, 1930

1,780,426

# UNITED STATES PATENT OFFICE

LOUIS B. HYDE, OF DETROIT, MICHIGAN

## HOT-WATER HEATER

Application filed April 8, 1929. Serial No. 353,526.

My invention relates to a new and useful improvement in a hot water heater of an electrically operated type and has for its object the provision of a heater of this class which will be simple in structure, compact, economical to manufacture, durable and highly efficient in use.

Another object of the invention is the provision of a hot water heater of this class so constructed and arranged as to permit easy and quick assembly and disassembly of the heater so that removal and replacement of the parts may be easily and quickly effected.

Another object of the invention is the provision of a casing structure for the heating element and for the reception of the water to be heated so that a maximum area is subjected to the heating.

Another object of the invention is the provision in a hot water heater of this class of a sectional heating element so that the capacity of the device for heating may be easily and quickly altered.

Other objects will appear hereinafer.

The invention consists in the combination and arrangement of parts hereinafter described and claimed.

The invention will be best understood by a reference to the accompanying drawings which form a part of this specification and in which,

Fig. 1 is a central longitudinal sectional view of the invention.

Fig. 2 is a side elevational view of the invention showing it attached to a hot water tank.

Fig. 3 is a central sectional view of the core used in the invention with parts shown in side elevation.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 1.

Fig. 5 is a view taken on line 5—5 of Fig. 1.

In the drawings, I have illustrated the invention attached to an inlet or delivery pipe 9 which is threaded into the neck 10 of the head 13. The head 13 is provided with a pair of lateral conduits or delivery branches 14 and 15, the branch 14 being connected in communication with the pipe 16 and the branch 15 being connected in communication with the pipe 17. The central branch 18 which projects from the head 13 is connected to the pipe 19 which is provided adjacent its upper end with openings 20 in communication with the space 21 which is formed between the shells or casings 22 and 23, these shells or casings being welded at their upper ends to the pipe 19. The lower end of the casing 23 is angularly turned as at 24 and through this angularly turned end 24 project the open ends of the pipes 16 and 17 so that water may be delivered into the space 21 through the openings 20 and through the pipes 16 and 17. The lower end of the shell or casing 22 is offset as at 26 and provided with the angularly turned portion 25 which lies in engagement with and is preferably welded to the inner surface of the housing or outer casing 44. The upper end of this outer shell or casing 44 is welded to the pipe 18 which projects there-through. A disc 27 serves as a closure for the lower end of the outer shell or casing 44, this disc 27 being held in position by the set screw 29 which is threaded into the collar 28 which embraces the pipe 19. A coil spring 30 engages at one end the inner surface of the disc or closure 27 and at its opposite end a collar 31 which engages the lower end of the core 33 which is provided with a peripheral flange 32 so that this core is normally held in position with the bead 32′ which is formed on the peripheral flange 32 in engagement with the angularly turned portion 24 of the shell or casing 23. This core 33 is provided with peripheral grooves in which engage the heating element or resistance wire 34 which is connected at its opposite ends to the terminals 35 and 36.

A delivery pipe 37 serves as an outlet delivery pipe for the heater and in Fig. 2, I have shown this pipe connected to a hot water tank 38 into which leads the inlet pipe 39 and from which leads the outlet pipe 40.

As shown in Fig. 3, the core is made sectional, the section 33′ being provided with tongues 41 which interlace with tongues 42 formed on the section 33″, this section having tongues 41′ interlacing with tongues 42′ formed on the section 33‴. The construction of the core is such that its length may be

determined so that it is not necessary in manufacture that cores of varying lengths be manufactured to accommodate heaters of different sizes. The construction of the core is one which permits of economical manufacture in that there is provided a double threading on its periphery, this threading consisting of parallel spirals so that the wire 30, when led to the upper end of the core, may be doubled around the shoulder 72 and led back over the periphery of the core in the other threads. Thus, there is no axially extending wire used on the core and all of the wire extended throughout the length of the core is coiled.

The construction is such that a ready removal and replacement of the core may be quickly accomplished, it being but necessary to release the closure 27 so that it may drop downwardly and the core removed from the casing 23.

With a water heater constructed in this manner, a maximum efficiency is provided with a minimum of space required.

While I have illustrated and described the preferred form of my invention, I do not wish to limit myself to the precise details of structure shown but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A hot water heater of the class described comprising: a plurality of casings mounted in embracing relation, said casings at one end being sealed to each other; a tube projected through said casings, the opposite ends of said casings being sealed on the periphery of said tube, said tube having openings formed adjacent one end between a pair of said casings; a delivery tube communicating with said central tube and the space between the two innermost casings.

2. A hot water heater of the class described comprising: a plurality of casings mounted in embracing relation, said casings at one end being sealed to each other; a tube projected through said casings, the opposite ends of said casings being sealed on the periphery of said tube, said tubes having openings formed adjacent one end between a pair of said casings; a pair of branch delivery tubes communicating with said central tube and extending into said space adjacent the lower end thereof; a core embracing said tube within said casings; a heating element wound on said core; a closure for the lower end of the outermost casing; and resilient means engaging said closure for normally retaining said core in operative position.

3. A hot water heater of the class described comprising: a plurality of varied sized casings positioned in embracing relation, the inner-most of said casings having its lower end angularly turned and extended into engagement with the outer-most of said casings; and an intermediate casing having its lower end angularly offset and extended in parallel relation in engagement with the inner surface of the outer-most casing, said outer-most casing being sealed in engagement with said portions; a tube projected through said casings, said casings being sealed on the periphery of said tubes, said tubes having openings formed communicating with the space between the inner-most and the intermediate casing; a fitting communicating with said tube; a pair of lateral branches on said fitting; a tube mounted in each of said branches and projecting through the angularly turned end of the inner casing and communicating with the space between said inner casing and said intermediate casing.

4. A hot water heater of the class described comprising: a plurality of varied sized casings positioned in embracing relation, the inner-most of said casings having its lower end angularly turned and extended into engagement with the outer-most of said casings; and an intermediate casing having its lower end angularly offset and extended in parallel relation in engagement with the inner surface of the outer-most casing, said outer-most casing being sealed in engagement with said portions; a tube projected through said casings, said casings being sealed on the periphery of said tubes, said tubes having openings formed communicating with the space between the inner-most and the intermediate casing; a fitting communicating with said tube; a pair of lateral branches on said fitting; a tube mounted in each of said branches and projecting through the angularly turned end of the inner casing and communicating with the space between said inner casing and said intermediate casing; and a heating element embracing said tube within said inner-most casing; and means cooperating with said outermost casing for retaining said heating element in position.

5. A hot water heater of the class described, comprising: a plurality of casings mounted in embracing relation, said casings at one end being sealed to each other; a tube projected through said casings, the opposite ends of said casings being sealed on the periphery of said tube, said tube having openings formed adjacent one end between a pair of said casings; a pair of branch delivery tubes communicating with said central tube and extending into the space between the two innermost casings adjacent the lower end thereof.

6. In a hot water heater of the class described, a casing for containing water; means for conducting water into the interior of said casing; a tubular heating element; an inner casing positioned within said water containing casing and embracing said heating element; a tube projected through said heat-

ing element and communicating with the interior of said first mentioned casing; an insulating casing embracing said water containing casing and spaced therefrom throughout the major portion thereof.

In testimony whereof I have signed the foregoing specification.

LOUIS B. HYDE.