Aug. 24, 1926. 1,597,427

O. W. BRENIZER

STEAM IRON

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Fig. 1.

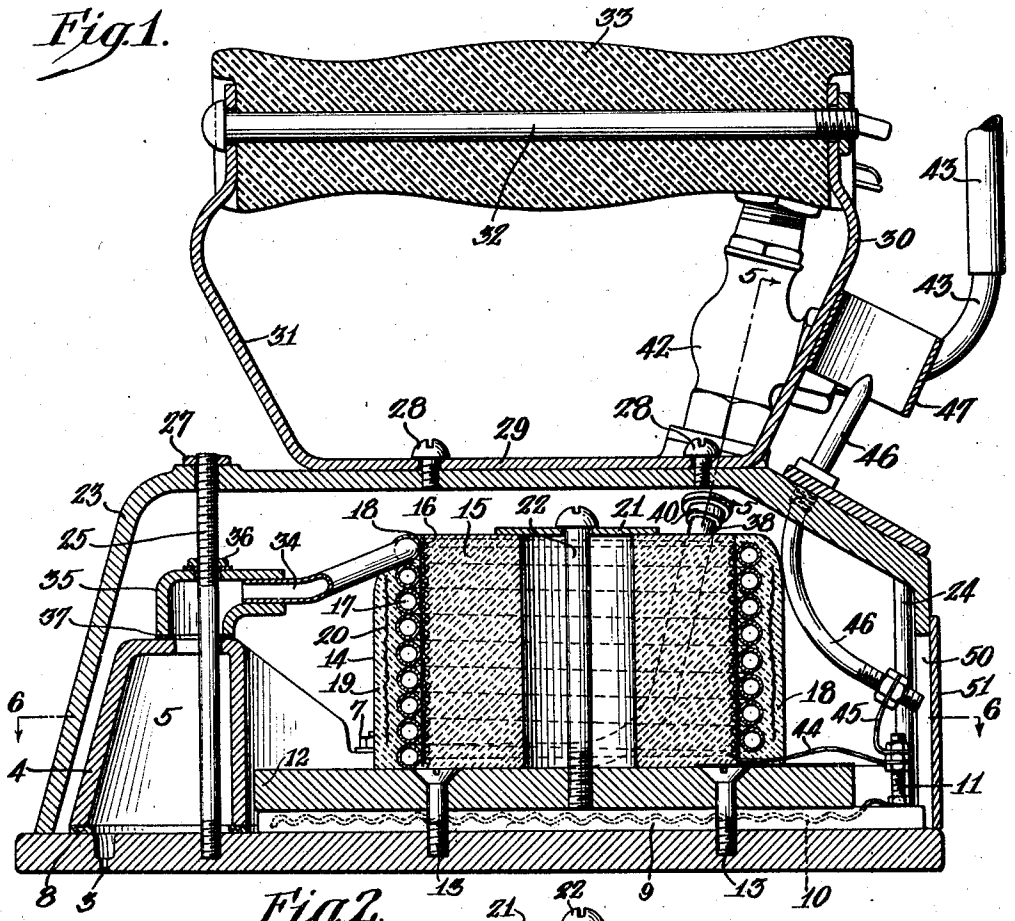
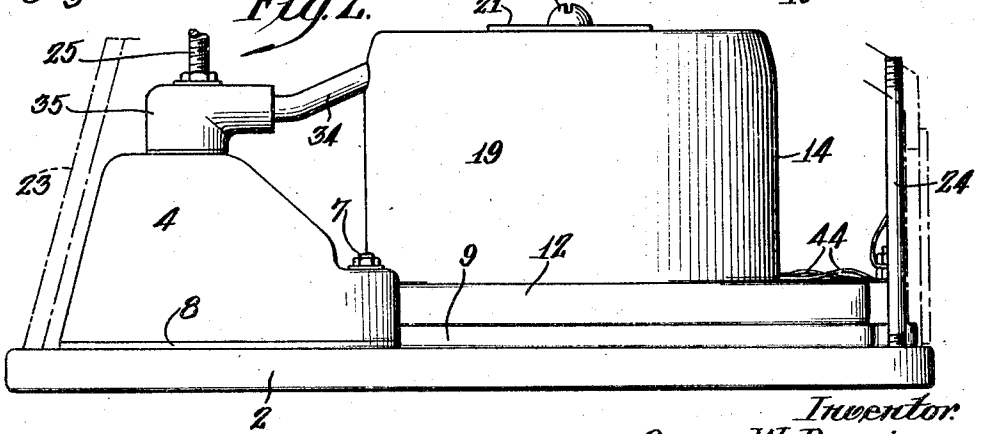



Fig. 2.




Inventor.
Orson W. Brenizer.
by A. V. Crowley
Attorney

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O. W. BRENIZER

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Fig. 3.

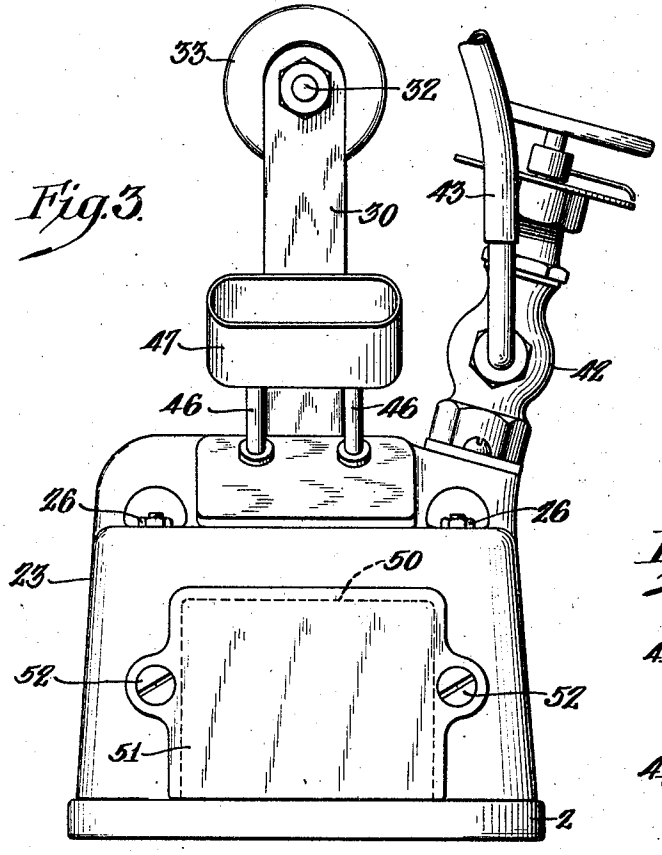



Fig. 5.

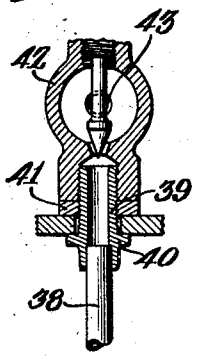
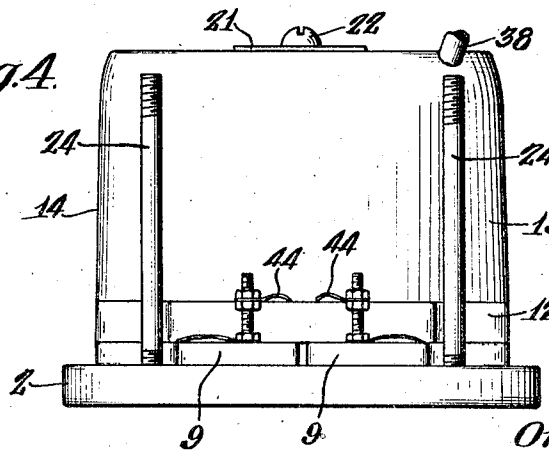



Fig. 4.




Inventor.
Orson W. Brenizer.
by A. V. Brown
Attorney.

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O. W. BRENIZER

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Fig. 6.

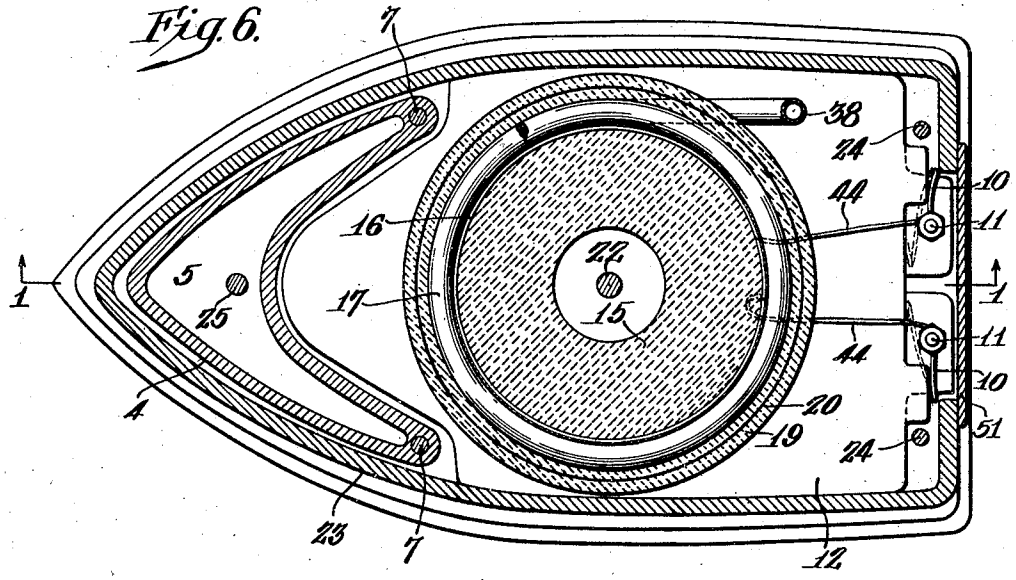
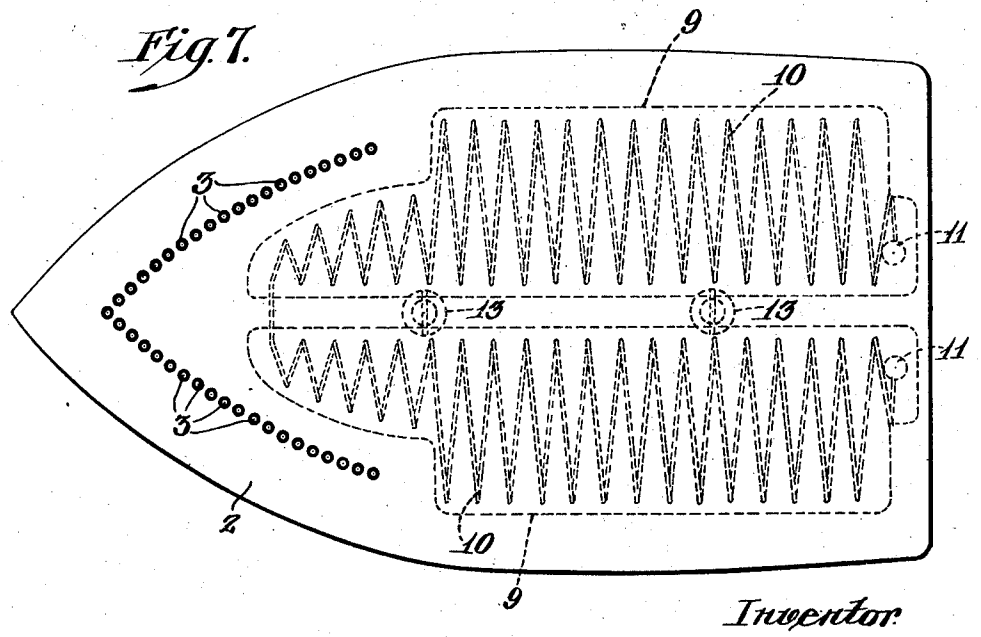



Fig. 7.




Inventor
Orson W. Brenizer
by A. Y. Towles
Attorney.

Patented Aug. 24, 1926. 1,597,427

# UNITED STATES PATENT OFFICE.

ORSON W. BRENIZER, OF PHILADELPHIA, PENNSYLVANIA.

## STEAM IRON.

Application filed March 23, 1925. Serial No. 17,492.

This invention relates to improvements in steam pressing irons adapted to be passed over articles of clothing and fabrics of various kinds for steaming or dampening and pressing the same.

An object of my invention is to provide an iron with a steam generator having a continuous passage for water, steam and superheated steam, the parts of which are constructed and arranged so that water may be received in one part of the passage, generated into steam in another part of the passage and the generated steam superheated in another part of the passage and to so construct and arrange the parts of the passage that all danger of water being forced by the generated steam out through the steam discharging openings or perforations of the iron is eliminated both when the iron is in a horizontal position and when it is tilted when in service. Another object of the invention is to provide two electrical heating elements connected to be supplied with current from the same source and constructed and arranged to provide the desired heat for both the steam generator and the bottom or smoothing surface of the iron; and a further object is to provide an iron of novel construction which can be produced at low cost and which will be durable and efficient when in service.

With the foregoing and related objects in view, the invention consists of the elements and the combinations of them hereinafter described and claimed.

In the accompanying drawings, illustrating the invention,

Figure 1 is a vertical longitudinal section of an iron showing one form of embodiment of my invention.

Figure 2 is a side view of the base plate and certain of the parts mounted thereon.

Figure 3 is a rear elevation of the iron.

Figure 4 is a rear view of the base plate and some of the parts mounted thereon.

Figure 5 is a detail, partly in section, showing the water supply valve and adjuncts.

Figure 6 is a horizontal section through the iron on line 6—6 of Fig. 1.

Figure 7 is a bottom view of the iron.

Referring to the drawings, 2 designates the base plate of the iron, having its forward end portion pointed and being shaped, as clearly shown in the drawings. The forward portion of the base plate 2 is provided with a V-shaped series of perforations 3 following the edge lines of the plate, as shown in Fig. 7, and providing steam passages from which steam may be discharged from the bottom of the plate.

The base plate 2 is provided with a hollow part 4 forming a steam chamber 5 which is in communication with the perforations 3. This part may be constructed and related to the plate 2 in any manner suitable for its intended purpose. As herein illustrated, the part 4 is formed separately from the plate 2 and it is secured thereto by means of screws 7, a suitable gasket 8 being interposed between the plate 2 and part 4 to form a tight joint.

Resting upon the base plate 2 side by side are two pads 9 of suitable electrical insulating material in which is embedded an electrical heating element 10 comprising two zig-zag shaped wires, see Fig. 7, which are joined at their forward ends and which have their rearward ends connected to two binding posts 11 on the pads 9. This element serves to heat the base plate 2 and keep it at the desired temperature when current is supplied thereto when the iron is in service. The pads 9 and the heating element 10 therein are clamped to the base plate 2 by and between a metallic supporting plate 12 which is held in place by screws 13 pasing through the plate 12 and screwed into the plate 2.

Detachably mounted on the supporting plate 12 is a steam generating device 14 comprising an inner body 15 of suitable electrical insulating and heat resisting material having a central opening extending vertically therethrough, an electrical heating element 16 consisting of a vertically extending coil of wire surrounding the body 15, a vertically extending coil of metal pipe 17 surrounding the element 16, a layer of mica 18 interposed between the element 16 and pipe coil 17, a body of suitable electrical insulating and heat resisting material 19 surrounding the mica layer 18 and in which the pipe coil 17 is embedded, and a suitable reinforcing element 20 embedded in the body 19. The steam generating device 14 is detachably secured to the top of the supporting plate 12 by a top plate 21 and a screw 22. The top plate 21 engages the top of the insulating body 15 and the screw 22 penetrates the plate 21 and extends down through the opening in the body 15 and is

screwed into the plate 12 in a manner to clamp the body 15 between the plates 21 and 12.

The parts other than the base plate 2, thus far described, are enclosed within a housing 23 which is arranged on the base plate 2 and forms the main body of the iron. The base plate 2 and housing 23 are detachably secured together by posts 24 and 25 which are screwed into the base plate 2 and extend upwardly therefrom through and beyond the top of the housing 23. The upper end portions of the posts 24 and 25 are threaded for the reception of nuts 26 and 27, respectively, which are screwed down upon the housing 23. After the nuts 26 and 27 have been removed, the housing 23 may be readily removed from the base plate 2 and posts 24 and 25 to afford access to the parts contained within the housing 23.

Secured upon the housing 23 by means of screws 28 is a bracket 29 having upwardly extending end arms 30 and 31 connected by a bolt 32 carrying a suitable handle 33 by means of which the iron may be manipulated when in service.

The upper end of the pipe coil 17 terminates in a forwardly extending arm 34 carrying a hollow head 35 in communication therewith and having an open bottom in registry with an opening in the top of the part 4 to afford communication between the upper end of the pipe coil 17 and the steam chamber 5. The post 25 extends through the chamber 5 and head 35, and the head 35 is clamped upon the part 4 by a nut 36 screwed on to the post 25, a gasket 37 being interposed between the part 4 and head 35 to provide a tight joint. After the housing 23 has been removed from the base plate 2, the steam generating device 14 may be readily removed after removing the screw 22 from the plate 12 and removing the nut 36 from the post 25.

The lower end of the pipe coil 17 terminates in an arm 38 which extends upwardly therefrom and is secured to and communicates with a sleeve 39 which extends through an opening in the housing 23. The lower end portion of the sleeve 39 is provided with a collar 40 adapted to engage the bottom of the top wall of the housing 23, and the upper end portion of the sleeve 39 is screw-threaded and provided with a nut 41 screwed down upon the housing 23 to clamp it between the collar 40 and nut 41. The screw threaded portion of the sleeve 39 extends above the nut 41 for the reception of the body portion of a suitable needle valve 42 which communicates with the sleeve 39 and which has a suitable water supply pipe 43 connected therewith. It will thus be seen that water may be supplied to the coil 17 from the supply pipe 43 under suitable pressure, and that the supply of water to the coil 17 may be nicely regulated by adjusting the valve 42.

The terminal portions 44 of the wire coil or heating element 16 are connected to the binding posts 11, and the posts 11 are connected by detachable plates 45 to a pair of electrical conductors 46 formed by stiff wires which are carried by the housing 23 and electrically insulated therefrom. These terminals 46 are positioned to receive a suitable detachable connecting plug to be inserted into a sleeve 47 which is carried by the arm 30 of the handle bracket 29 as a means of supplying electric current from a suitable source to the conductors 46.

It will now be understood that the heating elements 10 and 16 are connected in parallel. The two heating elements are proportioned and related to each other as to the length and gauges of the wires employed therein so that the resistance of the element 16 is lower than that of the element 9 and so that the element 16 will provide more heat than the element 9. I am thus enabled to provide sufficient heat in the steam generating device 4 for the production of the steam, as desired, and at the same time to provide a lesser degree of heat for the base plate 2, and thereby maintain the base plate 2 at the desired temperature when in service without danger of overheating it.

The pipe coil 17 is composed of a number of superposed turns or layers. The lower layer or layers constitute the water heating portion of the coil, the layer or layers of the coil which are intermediate the lower layer or layers thereof and the upper layer or layers thereof constitute the steam generating portion of the coil, and the upper layer or layers of the coil constitute the superheating portion of the coil for the steam generated in the intermediate layer or layers. I have discovered that by the provision of a coil of this character having the three portions at different levels, one above the other, and performing the three functions above described and by supplying the water to the bottom of the coil and conducting the superheated steam from the top of the coil, I am enabled to produce superheated steam and discharge it from the top of the coil 17 without any danger of the steam pressure forcing any water out through the discharge end of the coil even though the iron be tilted at many different angles when in service.

The superheated steam discharged from the coil 17 passes through its arm 34, the head 35 and chamber 5 to the perforations 3 from which it is discharged to dampen the article of clothing or piece of fabric being pressed or ironed.

The rearward wall of the housing 23 has an opening 50 therein which is normally closed by a removable plate 51 held in place by screws 52. This plate may be removed

to afford access through the opening 51 to detach the plates 45 of the conductors 46 from the binding posts 11 when it is desired to remove the housing 23 from the base plate 2, as previously described.

I claim as my invention:—

1. In a steam pressing iron, a base plate having perforations therein providing steam discharging passages, a flat electrical heating element extending horizontally over the base plate, a vertically extending heating element rising from above the first named element, a vertically extending pipe coil adjacent to the vertically extending heating element, means for conducting water to the lower end of said coil, means for conducting steam from the upper end of said coil to said perforations, and means for supplying current to said elements.

2. In a steam pressing iron, a base plate having perforations therein providing steam discharging passages, an electrical heating element secured upon the base plate for heating the same, a steam generating device provided with an electrical heating element secured upon the first named element and communicating with the perforations in the base plate, said elements being connected in parallel and the resistance of the first named element being higher than that of the second named element, and a pair of electrical conductors connected to said elements for supplying current thereto.

3. In a steam pressing iron, a base plate having perforations therein providing steam discharging passages, a pipe coil thereon forming a continuous passage and including a lower water heating layer, an intermediate steam generating layer above the water heating layer and an upper layer above the intermediate layer for superheating the steam, means for conducting steam from the upper layer of the pipe coil to the perforations in the base plate, means for conducting water to the lower layer of the pipe coil, and means for heating the pipe coil.

4. In a steam pressing iron, a base plate having perforations therein providing steam discharging passages, a vertically extending pipe coil thereon forming a continuous passage and including a lower water heating layer, an intermediate steam generating layer above the water heating layer and an upper layer above the intermediate layer for superheating the steam, a vertically extending electrical heating coil, one of said coils surrounding the other of said coils adjacent thereto, means for conducting steam from the upper layer of the pipe coil to the perforations in the base plate, means for conducting water to the lower layer of the pipe coil, and a pair of electrical conductors for supplying current to said heating coil.

5. In a steam pressing iron, a base plate having perforations therein providing steam discharging passages, an electrical heating element adjacent to the base plate for heating the same, a pipe coil above and separated from said element and forming a continuous passage and including a lower water heating layer, an intermediate steam generating layer above the water heating layer and an upper layer above the intermediate layer for superheating the steam, means for conducting steam from the upper layer of the pipe coil to the perforations in the base plate, means for conducting water to the lower layer of the pipe coil, an electrical heating element adjacent to the pipe coil for heating the same, and a pair of electrical conductors connected to said elements for supplying current thereto.

6. In a steam pressing iron, a base plate having perforations therein providing steam discharging passages, an electrical heating element adjacent to the base plate for heating the same, a pipe coil above and separated from said element and forming a continuous passage and including a lower water heating layer, an intermediate steam generating layer above the water heating layer and an upper layer above the intermediate layer for superheating the steam, means for conducting steam from the upper layer of the pipe coil to the perforations in the base plate, means for conducting water to the lower layer of the pipe coil, an electrical heating element adjacent to the pipe coil for heating the same, said elements being connected in parallel and the resistance of the first named element being higher than that of the second named element, and a pair of electrical conductors connected to said elements for supplying current thereto.

7. In a steam pressing iron, a base plate having perforations therein providing steam discharging passages, an electrical heating element adjacent to the base plate for heating the same, a vertically extending pipe coil separated from said element and having a series of superposed layers forming a continuous passage, a vertically extending electrical heating coil for heating said pipe coil, one of said coils surrounding the other of said coils adjacent thereto, means for conducting steam from the upper layer of the pipe coil to the perforations in the base plate, means for conducting water to the lower layer of the pipe coil, and a pair of electrical conductors connected to said element and said heating coil for supplying current thereto.

8. In a steam pressing iron, a base plate having perforations therein providing steam discharging passages, an electrical heating element adjacent to the base plate for heating the same, a vertically extending pipe coil separated from said element and having a series of superposed layers forming a continuous passage, a vertically extending elec-

trical heating coil for heating said pipe coil, one of said coils surrounding the other of said coils adjacent thereto, means for conducting steam from the upper layer of the pipe coil to the perforations in the base plate, means for conducting water to the lower layer of the pipe coil, said elements being connected in parallel and the resistance of the first named element being higher than that of the second named element, and a pair of electrical conductors connected to said element and said heating coil for supplying current thereto.

9. In a steam pressing iron, a base plate having perforations therein providing steam discharging passages, an electrical heating element adjacent to the base plate for heating the same, a vertically extending pipe coil thereon forming a continuous passage and including a lower water heating layer, an intermediate steam generating layer above the water heating layer and an upper layer above the intermediate layer for superheating the steam, a vertically extending electrical heating coil for heating said pipe coil, one of said coils surrounding the other of said coils adjacent thereto, means for conducting steam from the upper layer of the pipe coil to the perforations in the base plate, means for conducting water to the lower layer of the pipe coil, and a pair of electrical conductors connected to said element and said heating coil for supplying current thereto.

In testimony whereof I affix my signature hereto.

ORSON W. BRENIZER.