

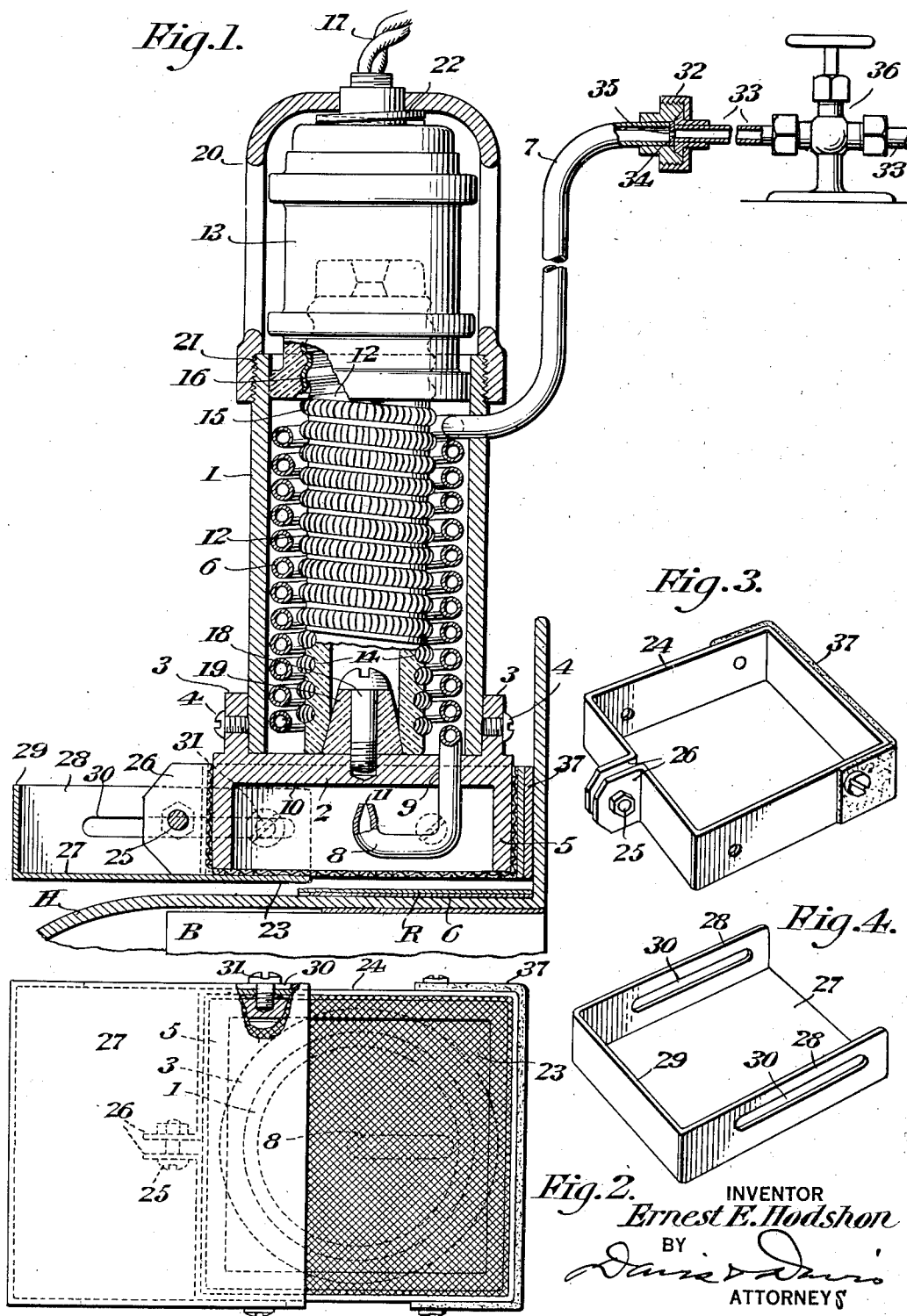
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STEAM GENERATING AND DISCHARGING DEVICE

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STEAM GENERATING AND DISCHARGING DEVICE.

Original application filed November 27, 1925, Serial No. 71,719. Divided and this application filed August 6, 1926. Serial No. 127,614.

An object of the present invention is to provide a compact and efficient device adapted to receive a small charge of water, quickly convert it into steam and discharge the steam in a given direction at low pressure and in a dry condition.

A further object of the invention is to provide a compact steam generating and discharging device in the form of a unit designed particularly for use with a hat banding apparatus shown in my application Serial No. 71,719. In the operation of said apparatus, a hat band and a strip of adhesive material, such as rubber cement, are wound around the crown of a hat in superposed relation with the band outermost, and steam is directed against the band to heat the underlying adhesive material, soften it and cement the band to the hat. The present device is adapted to economically generate the steam and to discharge it upon the band in a manner to facilitate the banding operation and to avoid injury to the hat.

This application is a division of my application for patent filed November 27, 1925, Serial No. 71,719.

In the drawings:

Fig. 1 is a longitudinal section through the device showing it disposed for steaming a hat band;

Fig. 2 a bottom plan view of the discharge end of the device; and

Figs. 3 and 4 perspective views of certain details of the structure at the discharge end of the device.

Referring to the various parts of the apparatus by numerals, 1 designates a cylindrical shell. Disposed across one end of said shell is a plate 2 formed at its inner face with an annular flange 3 which fits around the end of the shell. Screws 4 secure the flange 3 to the shell. The plate 2 is also integrally formed with a continuous flange 5 extending from the edges of its outer face. This flange 5 is square in outline and defines a discharge nozzle of slight depth but relatively large in cross section. A helically coiled water pipe or tube 6 of small diameter is arranged longitudinally within the shell 1 and extends throughout the greater portion of the length thereof. Leading from one end of the coiled pipe 6 is a water feed pipe or tube 7 which extends outwardly through an opening in one side of the shell

1. The opposite end 8 of the coiled pipe 6 extends outwardly through an opening 9 formed in the end plate 2. This emerging end 8 is directed inwardly toward the center of the outer surface 10 of the plate 2 and is formed with a discharge opening 11 in close proximity to said surface.

A heating unit extends into the shell 1 and includes a porcelain plug member 12 and a porcelain socket member 13. The plug member is in substantially the form of a hollow cylinder formed with a helical groove 14 around its outer surface. Wound in said groove is a coiled resistance wire 15. One end of the socket member 13 fits within the shell 1 and into said end the plug member is threaded as at 16. The ends of the resistance coils lead to contacts within the socket member. These contacts are adapted to make electrical connections in the usual manner with circuit wires 17 which lead into the outer end of the socket member. The plug 12 extends centrally throughout the length of the shell 1 and bottoms against the end plate 2. Secured to the inner side of the plate 2 by means of a screw 18 is a small tapered porcelain plug 19 which is adapted to enter the end of the plug member 12 and center it within the shell. The entire heating unit is held to the shell 1 by a retaining cap 20 which encloses the socket member 13 and is threaded upon the end of the shell as at 21. Interposed between the outer end of the socket member and the cap is a spring washer 22 which yieldingly holds the unit pressed inwardly against the end plate 2 and allows the various parts to expand slightly when heated.

Stretched across the enclosure formed by the flange 5 is a sheet of wire gauze 23. This sheet is folded back over the outer straight sides of the flange and is held in place by a split sheet metal clamping member 24 which surrounds the flange and is adapted to be clamped against the gauze by a bolt 25 which is passed through outwardly-turned ears 26 formed at the split in the clamping member. Mounted to slide across the gauze-covered aperture defined by the flange 5 is a rectangular sheet metal shield 27 formed with upturned side flanges 28 and with an upturned end flange 29. The side flanges 28 are adapted to slide over the sides of the clamping member 24 and are formed with elongated slots. Guiding and retain-

ing screws 31 are passed through the slots 30 and through the clamping member 24 and are threaded into the flange 5.

The water feed tube 7 leads from the shell 1 to a union 32 which joins it to a supply pipe or tube 33. Interposed between the joined ends of said tubes, within the union, is a washer 34 formed with a restricted opening 35. The pipe 33 leads to a source, not shown, of water under compressed air pressure and said pipe is provided with a manually operable valve 36 for controlling the admission of water to the tube 7.

In Fig. 1 the steam generating and discharge device is shown as disposed to direct steam upon the crown of a hat H mounted upon a hat block. Wound around the hat crown are a ribbon or band R and a strip of rubber cement C in superposed relation, with the band outermost. The generating and discharge unit is supported, by means not shown in the present application, with its discharge end in close proximity to the hat band and the shield 27 is adjusted across the gauze-covered discharge aperture to properly adjust the size of the aperture with relation to the width of the band R. The shield is held in an adjusted position by tightening the screws 31. The discharge end of the unit bears against the hat brim and in order to protect the brim from the heat one side of the split clamping member 24 is covered with a facing 37 of asbestos which contacts the brim.

When the valve 36 is opened, water flows from the pipe 33 through the restricted opening 35 into the feed pipe 7. This restriction opening is very small and so long as the valve remains open it ensures the delivery of water to the pipe 7 and its connected coils 6, in the form of a fine stream of constant volume. The plate 2, the shell 1 and the socket member 13 define a chamber which is intensely heated by the electrical coils 15. When the water enters the coils 6 within said chamber it is therefore quickly converted into steam. The steam is discharged through the opening 11 directly against the outer surface 10 of the plate 2. The inner surface of the plate is exposed to the interior of the heating chamber within the shell 1 and the plate is intensely heated. When the steam enters the nozzle enclosure defined by the plate 2, the flange 5 and the gauze 23, it expands, flows over the surfaces of the plate and the flange and is heated thereby before it passes out through the gauze. This expansion and heating of the steam just before it is discharged is very desirable. The steam flows evenly through the gauze at low pressure over the width of the hat band instead of emerging in a concentrated high-pressure jet which might injure the workman and would heat the band unevenly. The heating of the steam just be-

fore discharge prevents it from condensing and precipitating drops of water upon the hat. The gauze 23 serves to catch any drippings of condensation which may occur when the device is operated before it has had time to become sufficiently heated. The gauze also becomes heated as the device is used, and assists in preventing condensation. The heat received from the steam penetrates through the hat band and softens the cement strip C beneath it. The cement is thus rendered adhesive so that it intimately unites the band to the hat. By rotating the hat block the entire length of the band is brought beneath the device to receive the steam.

What I claim is:

1. A steam generating and discharging unit comprising a tubular shell; a plate mounted upon one end of said shell and forming a closure wall for it; means forming a discharge nozzle directed outwardly from said plate; an electric socket member mounted to close the opposite end of said shell; an insulation plug connected to said socket member and extending inwardly through the shell; an electric heating coil wound upon said plug; and a coiled water pipe encircling said plug and coil within the shell and formed with a discharge end extending outwardly from the shell into the nozzle and directed toward the outer face of the said plate therein, the plate, the shell and the socket member defining a heating chamber, whereby steam will be generated within the coiled pipe and the plate will be heated to receive the steam as it is discharged from the pipe and heat it before it leaves the nozzle.

2. A steam generating and discharging unit comprising a plate; means forming a closed heating chamber at one face of said plate; means forming a steam discharge nozzle at the opposite face of the plate; electric heating means within the said chamber; and a coiled pipe disposed within the chamber to receive heat directly from said heating means and extending from the chamber into the said nozzle and formed with a discharge end directed inwardly toward said face of the plate within the nozzle, the said plate being heated by the heat received from the heating chamber.

3. A steam generating and discharging device comprising a tubular shell; a plate mounted upon one end of said shell and forming a closure wall for it; a skirt flange extending outwardly from said plate and defining a discharge nozzle relatively large in cross section; an adjustable shield mounted upon the outer end of said nozzle to slide across it for varying the size of the nozzle opening; an electric socket member disposed to close the opposite end of said shell; an insulation plug connected to said socket and

extending through the shell; an electric heating coil wound upon said plug; a retaining cap detachably secured to the shell and extending over the outer end of the socket member; resilient means interposed between the said cap and the outer end of the socket member to yieldingly press the socket member and plug longitudinally toward the said closure plate; and a coiled pipe encircling the plug and heating coil within the shell and provided with a discharge end extending outwardly from the shell into the nozzle and directed toward the outer face of the said plate therein.

4. A steam generating and discharge device comprising a plate; means forming a chamber at one face of said plate; means forming a steam discharge nozzle relatively large in cross section at the opposite face of the plate; electrical means for heating said chamber and plate; and a coiled pipe disposed within the chamber and provided with a discharge end extending into said nozzle and directed inwardly toward the outer face of the plate within the nozzle.

5. A steam generating and discharging device comprising a plate; means forming a chamber at one face of said plate; means forming a steam-discharge nozzle relatively large in cross section at the opposite face of the plate; electrical means for heating said chamber and plate; a coiled pipe disposed within the chamber and extending into said nozzle; means within the nozzle to cause the steam discharged from said coil to directly contact with the outer face of the plate within the nozzle; a water feed pipe leading to said coiled pipe; a manually operable valve to control the flow of water to the coiled pipe through the said feed pipe; and means to restrict the admission of said water to a small stream of constant volume when the valve is open.

6. A device of the class set forth comprising a steam discharge nozzle formed with a discharge opening having a width substantially equal to that of a hat band; means to heat an inner wall of said nozzle; means to discharge steam into said nozzle; and a transversely adjustable shield mounted at the discharge end of the nozzle and provided with a solid, continuous, impermeable shield area formed to extend entirely across said nozzle opening and adapted to slide from one side of the opening toward the other side thereof to vary the size of the opening to correspond to hat bands of different widths.

7. A steam generating and discharging unit comprising a tubular shell closed at one end; a steam discharge nozzle connected to the shell and formed with a discharge opening having a width substantially equal to that of a hat band; an electric socket member mounted to close the opposite end of the shell; an insulation plug connected to said socket member and extending inwardly through the shell; an electric heating coil wound upon said plug; and a coiled pipe within the shell and connected to the said nozzle to discharge into it.

8. A steam generating and discharging unit comprising means forming a small chamber; a steam discharge nozzle directly attached to said chamber-forming means separated from the chamber, and formed with a discharge opening having a width substantially equal to the width of a hat band; heating means within said chamber; and a coiled pipe within the chamber to receive heat from the said heating means, said pipe being connected to the nozzle to discharge into it.

In testimony whereof I hereunto affix my signature.

ERNEST E. HODSHON.