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BATHING AND DRYING APPARATUS

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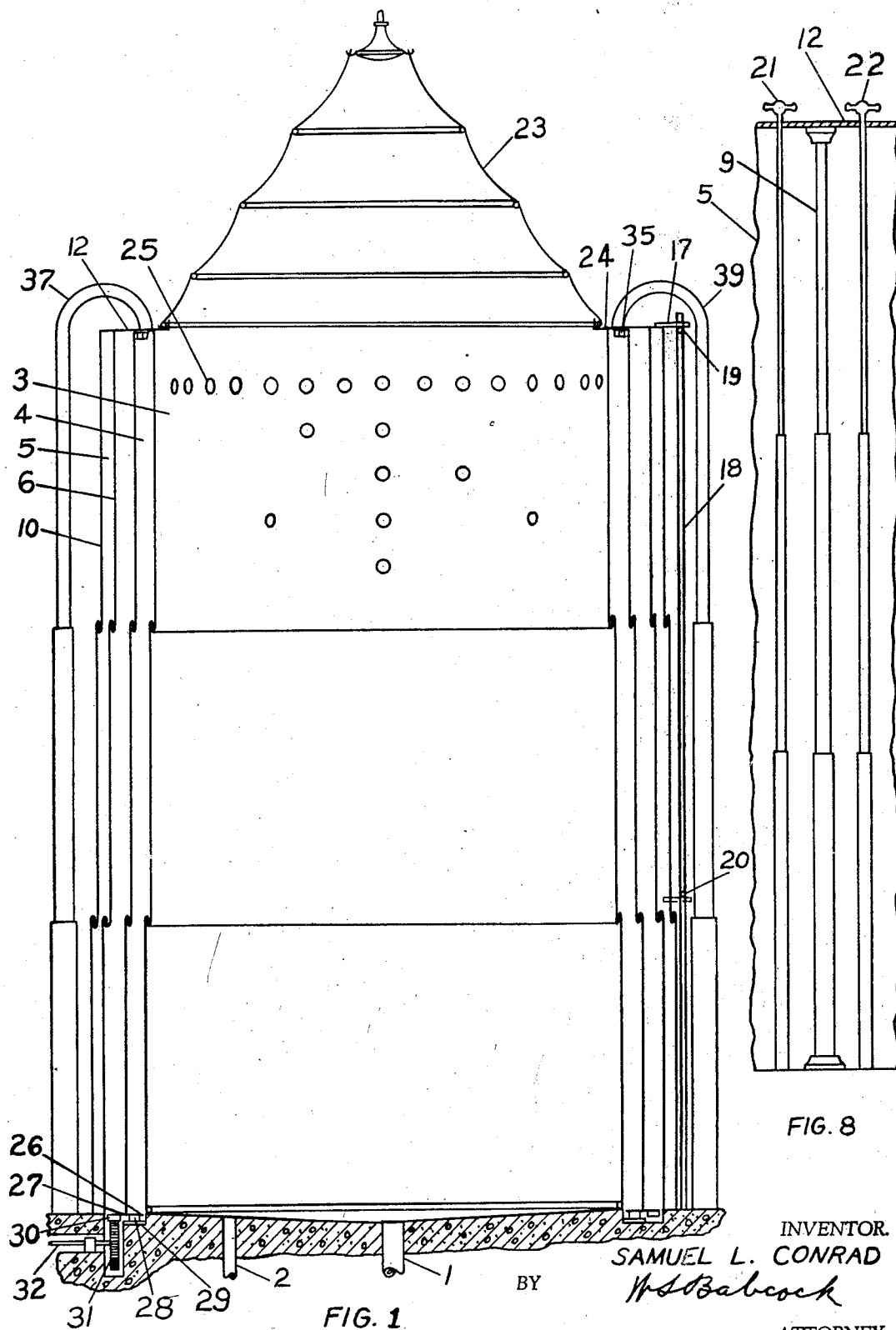


FIG. 8

FIG. 1

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BATHING AND DRYING APPARATUS

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27 Claims. (Cl. 4—173)

The invention to be hereinafter described relates to bathing and drying apparatus.

It is designed and intended, primarily, for domestic use, or in homes and households, including clubs, hotels and all other generally similar uses. However, it is thoroughly capable of efficient use in the open or out-of-doors, where ever the necessary service connections may be had.

The usual domestic bathing apparatus now in use is a stationary or fixed tub, most frequently oblong in shape and about eighteen inches to two feet high or deep. It is provided with connections for hot and cold water and a drain or gravity outlet. In use, the plug, stopper or drain closure is seated on or in the end of the drain and water is then run in to fill the tub to the desired amount and temperature, and then cut off. After bathing, the user simply pulls the plug to allow the water to run out and then steps out and dries himself with a towel. Such tubs, almost without exception, are of considerably less length than the average height of an adult. Thus, in using the present tub, for an adult, it is necessary to lie down in a more or less folded or "jack-knife" attitude in order to have the body covered with water. Even then, the tub must be filled to such extent that the water is easily spilled or splashed over onto the floor by movement of the bather. There is no way to avoid that. There is no way to circulate the water about or over the body of the user. There is no way to dry the body of the user while in the tub. There are, also, the well known shower baths. These are frequently combined with a tub bath. Their arrangement, construction and operation are all so thoroughly understood that there is no need to detail them here. Here, again, of course, there is no way to dry the body of the user while under the shower, except by towel.

The main objects of the present invention are to eliminate the above and other objections and draw backs and provide a simple, efficient, economical and compact bath tub or bathing and drying apparatus in which the user, whether a small child or an adult, may stand erect while bathing and be completely covered and surrounded by a body of water which is in continuous motion or circulation and contact with the body, the water being drained off as bathing is completed and a body of warmed air being circulated over and drying the body while remaining in the tub.

The tub, instead of being horizontal and requiring the user to lie horizontally and in an

awkward position, is vertical, permitting the user to stand erect, normally, and at full height.

In order to more clearly disclose the construction, operation and use of the invention, reference should be had to the accompanying drawings forming part of the present application. Throughout the several figures of the drawings like reference characters designate the same parts in the different views.

In the drawings:

Fig. 1 is a central vertical cross section, raised or extended, the shell walls and top being represented diagrammatically by single lines for clearness and a few, only, of the perforations being shown to indicate complete perforation of all sections of the inner shell;

Fig. 2 is a top plan view, reduced, of Fig. 1, omitting canopy;

Fig. 3 is a side elevation of Fig. 1, collapsed, omitting the canopy and partly broken away to show a lifting jack;

Fig. 4 is a diagrammatic cross section, enlarged, through a pair of the coupling flanges, between perforations;

Fig. 5 is a top plan view of Fig. 4;

Fig. 6 is a fragmentary cross section, enlarged, of the top plate and its connection with the shell sections;

Fig. 7 is a top plan view of a curtain to be used with the tub for steam baths; and,

Fig. 8 is a side elevation of the telescopic valve rods for the water supply and the hydraulic jack at that corner.

The foundation or support for the apparatus may be the same as for the present floor tub. It may be a wooden floor, concrete, tile or any other flooring suitable for a bath.

The usual drain 1 may be placed at any desired location within the tub walls, when the tub has been set up or placed in operative position or location. It may be closed in usual and well known manner, just as in the present horizontal type of tub, by a plug, stopper or the like. Or, if desired, a valve may be used and operated to open and closed position in the same way as the valves for the hot and cold water supply. The inlet 2 also may be at any desired or preferred location within the tub wall, when the tub has been placed in operative position. It opens upwardly and delivers upwardly into the tub.

The complete tub, of this invention, comprises three concentrically disposed collapsible or telescopic shells, 3, 4 and 5, respectively, slightly spaced apart. Preferably, each shell consists of three cylindrical sections 6, of successively de-

creasing diameters, the one of greatest diameter being stationary or fixed and securely fastened to the floor or base. Preferably, the connection between floor and section 6, especially that of the outer of the three cylindrical shells, should be water tight to prevent leakage of water from the bath onto the floor or foundation. The circumferential edges of the sections 6 of each shell are folded over to present U-shaped coupling flanges 7 which, as the sections are extended, becomes interengaged, as shown in Fig. 1, and tie the sections together in that extended relation. Preferably, the three sections 6 of each shell are of substantially the same length—each about $\frac{1}{3}$ of the total maximum extended length. To be most conveniently usable for the greatest number of people, the sections should be so proportioned that, when extended, the top edge of the top sections would fall in the same horizontal plane, about, as the top of the shoulder of a man of average height. If we assume that to be about 5 feet, then each section 6 would be about 1' 8". So, with all sections collapsed or telescoped, so that the tub is in its lowest position or shallowest disposition, it would be amply shallow and safe for a very young child. Also, when collapsed, prior to use, it is amply low to step into and out of, as is done with the present standard tub. In order to somewhat cushion and, at the same time, amply seal the contact or joint between the interengaged flanges 7, rubber or other suitable packing 8 is used, each U-bend of each flange 7 being partially filled with it so that the edge of the cooperating flange seats on the cushion and does not bite directly and destructively into the metal.

The apparatus is designed for simultaneous extending or raising of and collapsing or telescoping of the three shells. For that purpose, a plurality of hydraulic jacks 9 are used. As shown in the drawings, there are four arranged equidistantly around the outer shell of the three cylindrical shells. As a protection against contact with the moving parts of these jacks and as a matter of appearance, a fourth shell 10, having sections 11, is provided. This shell is just sufficiently wide to receive the widest of the other shells. The hydraulic jacks are disposed in the respective corners of shell 10 between 10 and the outer cylindrical shell. The lower section of this shell is stationary and, preferably, should have water tight connection between it and its base. A plate 12 bridges the spaces between and connects the upper edges of the upper sections of all four shells and the top of each jack is seated against and secured to the underside of this plate so that the plate and the shells must all rise and fall simultaneously and to the same extent as and with the jacks. Plate 12 provides a top or cover having a circular opening of the same diameter as the inner or top section 6 of the inner cylindrical shell. Bars, spiders, grills or other strengthening and stiffening constructions of any usual and well known type may be interposed between the jack ends and plate 12 to receive the thrust of the jacks. These jacks are all on the same supply line 13 which is fed from a suitable main by any usual and well known type of reversible pump 14 driven by a reversible motor 15. Preferably, the main leads into a small reservoir or tank so that the water pumped from the jacks is not wasted but is returned to the tank and is then pumped back into the jack from the tank, all as will be readily understood. And, of course,

it will be understood that the jacks will be held stationary by stopping of the pumps at any desired point in the rise or fall of the jacks. For controlling the motor, a suitable switch 16 is provided. Preferably, it will be mounted on plate 12 in easy reach of a person standing inside the tub cylinders. And it may be any one of the well known types of either rotary or push button switches arranged to give forward drive, stop, and reverse. Thus, a user, stepping into the tub would operate the switch for forward, which would start the lifting or raising action. When the shells reach the desired height, he would again operate the switch to stop, holding the shells at that height. When he had finished his bath he would again operate the switch to lower the shells. The details of the wiring and switch are all well known and readily available and are, therefore, neither illustrated nor described in this case, as, in themselves, they are no part of the present invention. And the same is true of the several switches, motors and pumps used in this invention and referred to at various points throughout this application. In order to prevent possible damage due to over run of the jacks in either direction, an automatic stopping device has been applied. This comprises a small bar or plate 17 carried by top plate 12 and extending horizontally outwardly beyond 12 so that its free end travels in sliding contact with a rod 18 carrying suitable switches 19 and 20. Switches 19 and 20 may be of the push button, rotary or any other well known type and so disposed in circuits leading to motor 15 as to stop the motor when operated by 17 for that purpose. So, as the shells reach their fully extended position or maximum height, bar 17, engaging switch 19 stops motor 15, thereby preventing over run in that direction. And, as the shells reach their fully extended collapsing or telescoped position, in the opposite direction, bar 17, engaging switch 20 stops motor 15, thereby preventing over run in that direction. This telescoped or collapsed position, is, of course, the starting position.

We will assume that an adult is using the invention, that he has stepped into the tub and has run it up to the full height. To turn the water in he operates the faucet handles 21 and 22 for hot and cold water, respectively, to get a water mixture of the right temperature, the flow coming in through 2. Handles 21 and 22 are mounted on plate 12 within easy reach of the user and are connected by telescopic rods with their respective valves so that these valves may be closed or opened at any height of the shells. It will be readily understood, of course, that the drain may be controlled by a valve operated in the same manner, by an additional telescopic rod and handle. In that case, the plug or stopper, previously referred to, for the drain pipe would be omitted.

The invention may be used as a simple shower bath. For that purpose, it will be installed directly below the usual standard shower bath head or rose and the control valves of the shower will be raised and extended toward the center of the shells into such position that they will extend across plate 12, when 12 is in its highest position, and into easy reach of the user. A canopy 23 or umbrella like curtain extends from the shower head to plate 12, suitable spreader hoops or rings keeping it in open or extended position. A series of small hooks 24 or the like fasteners on plate 12 engage the lower part of 23 either by hooking over the lower hoop or by hooking

through a plurality of eyes through the lower part of the canopy. Now, with the shells at full height and the canopy in place, the shower may be turned on for a shower bath.

To increase the efficiency of the bath, the body of water within the shell and surrounding the body of the user, may be kept in continuous circulation so that fresh water is continually contacting the body and used water with waste continually leaving the body. For this purpose, the inner shell is provided with a great plurality of small perforations 25, a few, only, being shown in the drawings. It will be well understood that the number of perforations per square foot of shell surface and the diameter or size of each perforation may be varied within wide limits and that such variations correspondingly affect the currents generated by the vanes 33, hereinafter referred to. This shell, as well as the outer cylindrical shell, while free to telescope vertically, can not rotate about its vertical axis. The intermediate or second of the three cylindrical shells, however, is mounted to rotate. For that purpose it is provided with two radial flanges 26 and 27 carried by its lower part or section at the lower edge thereof. Flange 26 carries a plurality of roller bearings 28 travelling freely on a circular bearing plate 29 let into the floor surface. Flange 26, of course, also acts as a spacer between its shell and the inner shell. Flange 27 carries an annular gear 30 meshing with and driven by the gear wheel 31 on the end of the shaft 32 which may be driven from any suitable and well known source of power. A simple and efficient arrangement is an electric motor of well known type coupled to shaft 32 and operated by a current controlled by a suitable switch 42 placed on the plate 12 within easy reach of the user. In this instance, flange 27 also spaces the revoluble shell from the next adjacent outer shell, as will be clear. The revoluble shell as well as the next outer shell, is imperforate or solid. Each section of it carries a plurality of narrow vanes or blades 33 inclined relatively to the axis of rotation of the shell. Thus, rotation of this shell generates a considerable current between that cylinder and the perforated cylinder, forcing water through perforations in advance of each blade and drawing it back through perforations in the rear of each blade. This maintains a plurality of currents of water about and over the body of the bather. The character and the intensity of these currents depends upon the shape, size, and disposition of the vanes and the speed of rotation of the shell carrying the blades. Their width, of course, is such that they will not interfere with the telescoping of the sections 6. Their action is somewhat analogous to that of a propeller blade.

In order to enable free rotation of the intermediate shell relatively to the other shells, the upper edge of its inner section is provided with an outwardly directed radial flange 34 provided with a plurality of roller or other antifriction bearings 35 which seat on and travel over a race 36 formed on an annular bar or plate which is secured to the under face of 12 and offset to receive and support the bearings 35 carried by flange 34. So, as the non-rotating shell sections are raised or lowered, the rotating shell sections are compelled to travel with them. But, as will be clear, the rotating shell sections are free to rotate, relatively to the other sections, at all times. Due to the anti-friction bearings 35 there is little friction or corresponding resist-

ance offered to rotation of the sections of the intermediate cylindrical shell. Such resistance as is offered is due almost entirely to the vanes 33. Consequently, the gripping action of the edge of each flange 7 against the packing 8 and the frictional hold of the packing on its flange is sufficient to prevent relative rotation between the sections of the rotatable cylindrical shell. If desirable, this may be increased by corrugating the flange edges engaging the packing or by using packing having a high frictional action or both.

After bathing, the body may be quickly, comfortably and uniformly dried by currents of warm air. For this purpose, a warm air duct 37 is provided. It is a simple telescopic tube having an elbow or goose-neck at its upper end connected to plate 12 and leading through that plate into the upper end of the annular chamber between the rotating shell and the innermost or perforated shell. Warm air flowing from this duct will pass through the perforations and over the body of the bather. Warm air may be supplied by any well known type of blower, fan or the like, electrically driven in well known manner by a current controlled by a push button, switch or other device 38 conveniently mounted on the plate 12 within easy reach of the bather. At a distance, from 37, preferably approximately diametrically opposite, is similarly disposed an exhaust duct 39 through which air may be drawn from the shells by a blower, fan or the like in just the same way. The operating circuit is controlled in the same manner as for the air supply duct, by a switch or the like 40. Ducts 37 and 39, being telescopically disposed and having their upper ends coupled securely to plate 12, rise and fall with the shells and so may supply and exhaust the warm air at any and all heights of these shells. It will be understood, of course, that a single switch may be used for controlling flow through 37 and 39, turning on both and cutting off both, simultaneously. The stronger or more rapid the circulation of the warm air, the more rapid and complete the drying, as is well known. So, during drying, the rotating shell may be kept in motion or even speeded up to circulate the air and more rapidly complete drying.

The invention has been described in its uses as a simple tub bath, disposed vertically; as a tub bath with water circulating means; and as an air drying means or apparatus. It may, also, operate as a steam bath. It is only necessary to run steam in instead of water. For that purpose two telescopic pipes may be used, as indicated in dotted lines. They would be connected to and carried by plate 12, similarly to ducts 37 and 39. The flow of steam would be controlled by push buttons as with the flow of air. In order to get complete distribution of the steam, the rotatable shell may be operated. The steam, entering at the top, between the central rotating shell and the inner perforated shell will be caught by the vanes 33 and carried circumferentially around the bath, the incline and curvature of the vanes forcing the steam back and forth through the perforations and also moving it lengthwise or vertically of the shells.

When used as a steam bath, the circular curtain 41 is substituted for the shower canopy 23. It is provided with eyelets to receive hooks 24 and may be closed about the neck of the user by the well known zipper. Or snap fasteners may be used to connect the curtain edge to plate 12. Obviously, too, a tighter fitting metal plate could be substituted for the curtain. The curtain is a

simple, efficient, light weight and economical closure to hold the steam in. Clearly, this curtain may also be used in any other use of the bath tub except when it is used as a shower bath. Then, of course, it would be in the way.

Obviously, the shower canopy may be used in every use of the invention, except when a steam bath is desired. When the steam bath is desired the user must have his head outside, as would not be possible with the canopy.

It is thought that the construction, operation and use of the invention will be clear from the preceding detailed description.

Many changes may be made in the construction, arrangement and disposition of the various parts of the invention, within the scope of the appended claims, without departing from the field of the invention and it is meant to include all such within this application, wherein only one preferred form has been shown, purely by way of illustration and with no thought or intention of in any degree limiting the claims of the application by such illustration.

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

1. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each comprising a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, means for extending said shells, and means for supplying water to the interior thereof.

2. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each comprising a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, means for extending said shells, means for supplying water to the interior thereof, and means for creating currents through the water so supplied.

3. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each comprising a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, means for extending said shells and means supplying a drying current of air thereto.

4. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each comprising a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, means for extending said shells, means for supplying water thereto, and means for supplying a drying current of air thereto.

5. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each comprising a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, means for extending said shells, means supplying water thereto, means creating currents through the water so supplied, and means supplying drying currents of air thereto.

6. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each comprising a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, and a shower bath supplying water thereto.

7. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each comprising a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, means

for extending said shells, and means for closing said shell.

8. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each comprising a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, means for extending said shells, a shower bath above said shells, and a canopy enclosing said shower and extending to said shell.

9. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each comprising a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, means for extending said shells, and means for supplying steam within said shell.

10. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each comprising a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, means for extending said shells, means for supplying steam within said shell, and means for closing said shell.

11. An apparatus of the character described comprising, a telescopic cylindrical shell comprising a plurality of rigid, concentric sections disposed vertically and having one section stationary and with water tight connection to its base, and means for extending said shell, said shell, in collapsed position, constituting a relatively shallow tub into which a user may conveniently step, while, in extended position, it provides a tub having a depth approximately equal to shoulder height of an adult.

12. An apparatus of the character described comprising, a telescopic cylindrical shell consisting of a rigid stationary section and a plurality of rigid sections concentric therewith and movable longitudinally relatively thereto, interengaging flanges carried by said sections and limiting the travel of said sections, and joint sealing packing carried in the flanges of one section and engageable by the flange of a cooperating section.

13. An apparatus of the character described comprising a plurality of concentrically disposed telescopic cylindrical shells each consisting of a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, means for simultaneously extending all of said shells equally, and means for supplying water to said apparatus.

14. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic cylindrical shells each consisting of several sections, the innermost shell being provided with a plurality of perforations, means for rotating a shell next adjacent said innermost shell, and means carried by said rotatable shell and adapted to create currents through said perforations.

15. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each consisting of a plurality of sections, the innermost shell being provided with a plurality of perforations, means for rotating an intermediate shell, means for simultaneously extending all of said shells equally, means for supplying water to said shells, means for supplying air between two of said shells, and vanes carried by said rotating shell between it and the innermost shell and creating currents through the aforesaid perforations.

16. An apparatus of the character described comprising a plurality of concentrically disposed

radially spaced cylindrical shells each consisting of a plurality of sections, the innermost shell being provided with a plurality of perforations, means for rotating an intermediate shell, vanes carried by said intermediate shell between it and the innermost shell and creating currents through the aforesaid perforations, means for supplying water to said shells, means supplying air between two of said shells, means supplying steam between two of said shells, and means simultaneously extending all said shells equally.

17. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each comprising a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, means for extending said shells, means supplying water thereto, and telescopic means carried by said shell and controlling said water supply.

18. An apparatus of the character described comprising two concentrically disposed and radially spaced non-rotating cylindrical shells the inner one being perforated, a third telescopic cylindrical shell concentric therewith, intermediate thereof and radially spaced therefrom, said third shell being imperforate and rotatable relatively to said other shells, connections between said shells compelling extension of said intermediate shell with said other shells and means for extending said shells.

19. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each comprising a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, means for extending said shells, and means automatically preventing over run in extending.

20. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic shells each comprising a plurality of concentrically disposed, rigid, cylindrical sections successively nestable one within the other, means for extending said shells, and means for automatically preventing over run in either longitudinal direction.

21. An apparatus of the character described comprising two concentrically disposed and radially spaced non-rotating cylindrical shells the inner one being perforated, a third telescopic cylindrical shell concentric therewith, intermediate thereof and radially spaced therefrom, said third shell being imperforate and rotatable relatively to said other shells, connections between said shells compelling extension of said intermediate shell with said other shells, means for extending said shells, and means preventing extension of said shells beyond a predetermined point.

22. An apparatus of the character described comprising two concentrically disposed and radially spaced non-rotating cylindrical shells the inner one being perforated, a third telescopic cylindrical shell concentric therewith, intermediate thereof and radially spaced therefrom, said third

shell being imperforate and rotatable relatively to said other shells, connections between said shells compelling extension of said intermediate shell with said other shells in a vertical direction, means for moving said shells vertically, means limiting upward vertical travel of said shells and means limiting downward vertical travel thereof.

23. An apparatus of the character described comprising two concentrically disposed and radially spaced non-rotating cylindrical shells the inner one being perforated, a third telescopic cylindrical shell concentric therewith, intermediate thereof and radially spaced therefrom, said third shell being imperforate and rotatable relatively to said other shells, connections between said shells compelling travel of said intermediate shell with said other shells, fluid operated means for travelling said shells vertically, means controlling the operation of said fluid operated means, and a device carried by one of said shells and engaging said controlling means at a predetermined point in the travel of said shells.

24. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic cylindrical shells each consisting of several sections, the innermost shell being provided with a plurality of perforations, means for rotating a shell next adjacent said innermost shell, means for supplying water to said shell, and means carried by said rotatable shell and adapted to create currents through said perforations.

25. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic cylindrical shells each consisting of several sections, the innermost shell being provided with a plurality of perforations, means for rotating a shell next adjacent said innermost shell, means for supplying air to said shells, and means carried by said rotatable shell and adapted to create currents through said perforations.

26. An apparatus of the character described, comprising, a plurality of concentrically disposed telescopic cylindrical shells each consisting of several sections, the innermost shell being provided with a plurality of perforations, means for rotating a shell next adjacent said innermost shell, means for supplying water to said shells, means for supplying air between two of said shells and means carried by said rotatable shell and adapted to create currents through said perforations.

27. An apparatus of the character described comprising, a plurality of concentrically disposed telescopic cylindrical shells each consisting of several sections, the innermost shell being provided with a plurality of perforations, means for rotating a shell next adjacent said innermost shell, means for supplying steam between two of said shells, and means carried by said rotatable shell and adapted to create currents through said perforations.

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