No. 760,443. PATENTED MAY 24, 1904.

W. M. FULTON.

THERMOSENSITIVE DEVICE.

APPLICATION FILED MAY 19, 1903.

NO MODEL.

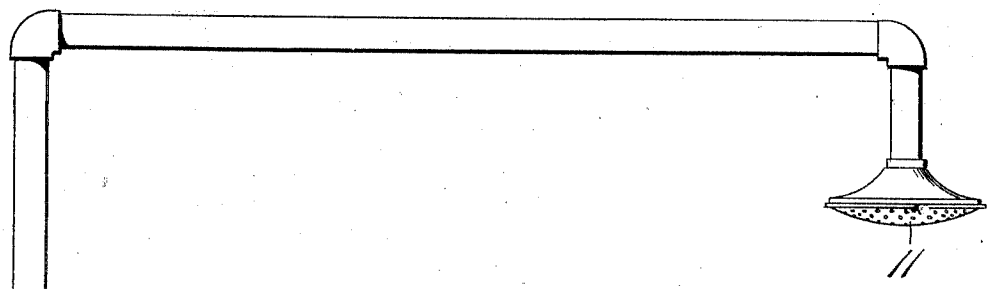
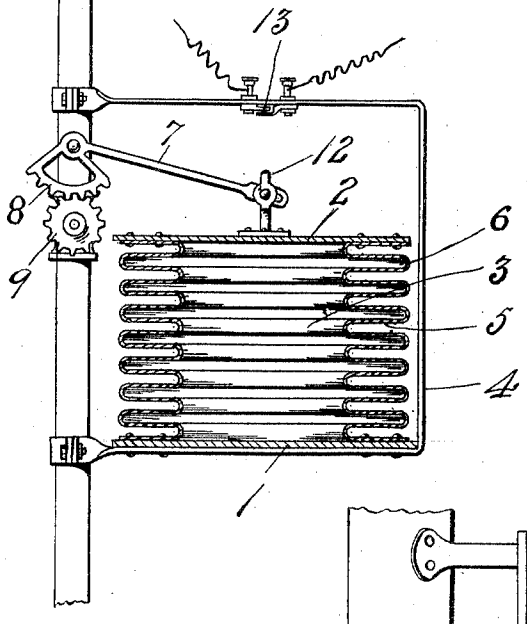


FIG. 1.



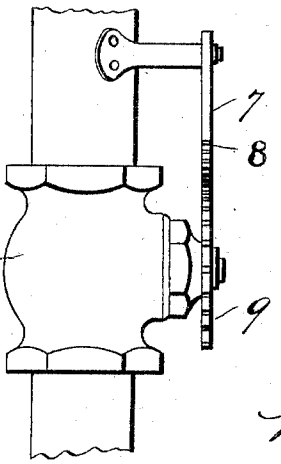


FIG. 2.

Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 760,443. Patented May 24, 1904.

UNITED STATES PATENT OFFICE.

WESTON M. FULTON, OF KNOXVILLE, TENNESSEE.

THERMOSENSITIVE DEVICE.

SPECIFICATION forming part of Letters Patent No. 760,443, dated May 24, 1904.

Application filed May 19, 1903. Serial No. 157,857. (No model.)

To all whom it may concern:

Be it known that I, WESTON M. FULTON, a resident of Knoxville, Tennessee, have invented a new and useful Improvement in Thermosensitive Devices, which invention is fully set forth in the following specification.

This invention relates to thermosensitive devices, and has for its object to produce a thermosensitive device which will automatically respond to changes in temperature.

It is a well known physical law that at any fixed temperature a saturated vapor will change in volume without change in tension, since its own liquid will continually give off or absorb vapor and maintain a fixed pressure at any definite temperature. The change of tension with a saturated vapor which occurs as the result of changes in temperature is also widely different from that which usually results from changes in temperature in the course of other physical processes.

The object of the present invention is to utilize the valuable properties of saturated vapors to perform work in a variety of useful ways.

According to my invention I confine a saturated vapor within a vessel whose changes in volume can take place along a line of one dimension of the vessel only, and at the same time I provide the vessel with resilient walls so constructed that they yield readily along the line of the desired dimension, but are unyielding in any other direction. This vessel consists of rigid end walls and corrugated side walls connecting said end walls, the material of the side walls being of such a character that it shall be rigid enough to resist lateral pressure to which it may be subjected by the vapors within or the atmosphere without the vessel and being deeply corrugated, so that it readily yields to permit the vessel to expand or contract, the corrugations, however, being entirely free from any angular construction which would form lines of breakage or deterioration in the metal. A vessel of this construction inclosing a saturated vapor is capable of a great variety of uses, and for the purpose of illustration I have shown one of these in the accompanying drawings, wherein—

Figure 1 illustrates a broken side elevation of an automatic fire-alarm and fire-extinguisher, with the vessel containing the saturated vapor shown in vertical section; and Fig. 2 is a side elevation of a detail of Fig 1.

Referring to the drawings, the collapsible vessel, consisting of the rigid end walls 1 and 2, connected by the corrugated walls 3, is mounted with the wall 1 firmly secured to any suitable support 4. Corrugated walls 3 may be composed of any material sufficiently rigid to resist the lateral expansion of the saturated vapor contained within the vessel, sheet-steel, sheet-brass, and similar metals being quite suitable for the purpose. The corrugations of the vessel are formed, as shown, so as to present horizontal planes or parts 5, connected by curved portions 6, the whole being constructed in such manner that it is without angles from one end to the other thereof. By proper selection of the saturated vapor to be employed the device may remain inert at all temperatures below a given temperature, but may become active at or above any desired temperature. For example, suppose it is desired to have the device illustrated in the drawings become active at a temperature of 135° Fahrenheit. For this purpose the vessel may be charged with a saturated vapor of silicon chlorid, which at all temperatures below 135° Fahrenheit will have a tension of less than atmospheric pressure. Hence the pressure of the atmosphere on the outside of the vessel will overcome the pressure of the saturated silicon-chlorid vapor on the inside of the vessel and prevent any appreciable expansion thereof; but if the temperature be raised to a point above 135° Fahrenheit the pressure of the saturated vapor of silicon chlorid will exceed that of the atmospheric pressure and will cause the vessel to expand, pushing the wall 2 upward, and this movement of the top wall may be utilized to perform a variety of useful forms of work. As here shown, the top wall is connected to a lever 7 with a toothed segment 8, which engages with a pinion 9, attached to a valve-stem within the valve-casing 10, the pipe being shown as leading to a sprinkler 11. The parts are so arranged that at normal temperatures the vessel will be sufficiently collapsed to retain the valve closed; but upon a substantial increase

in temperature—as, for example, above 135° Fahrenheit—the expansion of the saturated vapors within the vessel will cause the wall 2 to rise high enough to turn the valve within the casing 10, so as to permit a flow of water to the sprinkler 11. The upper wall 2 is provided with any suitable part, as a projecting pin 12, which acts when the vessel is fully expanded to contact with a circuit-closer 13 of an electric fire-alarm, so that upon turning on the water or other fire-extinguishing fluid an alarm will simultaneously be sounded.

One of the great advantages of this combination is found in the fact that it will remain practically inert until the desired temperature is reached and will then become positively active, producing as much movement as may be required without any decrease of force as the result of the expansion. Furthermore, it is adjustable to any temperature desired by merely selecting a suitable saturated vapor for employment in the vessel.

Having thus described the invention, what is claimed is—

1. A hermetically-sealed vessel capable of expansion and contraction along the line of one dimension only and containing a saturated vapor.

2. A hermetically-sealed expansible and collapsible vessel containing a saturated vapor and consisting of rigid end walls connected by corrugated walls yielding along the line of one dimension only.

3. An expansible and collapsible vessel having a saturated vapor hermetically sealed therein, said vessel consisting of rigid end walls connected by metallic corrugated non-angular side walls.

4. An expansible and collapsible vessel yielding along the line of one dimension only and containing a saturated vapor which will not materially increase in tension until a predetermined temperature is reached.

5. A collapsible vessel having a saturated vapor hermetically sealed therein, said vessel consisting of rigid end walls connected by corrugated side walls, the corrugations consisting of planes substantially normal to the line of collapse of the vessel connected by curved portions.

6. The combination of an expansible and collapsible vessel increasing in volume along the line of one dimension only and having a saturated vapor hermetically sealed therein, with an automatic fire-extinguisher.

7. The combination of an expansible and collapsible vessel increasing in volume along the line of one dimension only and having a saturated vapor hermetically sealed therein, with an automatic fire-alarm.

8. The combination of an expansible and collapsible vessel increasing in volume along the line of one dimension only and having a saturated vapor hermetically sealed therein, with an automatic fire-extinguisher and fire-alarm.

9. A hermetically-sealed vessel capable of expansion and contraction along the line of one dimension only and containing vapor of silicon chlorid.

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

WESTON M. FULTON.

Witnesses:
HUGH M. TATE,
ROBT. M. WILLIAMSON.