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Daley

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[54] **ELECTRICAL HEATING CABLE WITH INDICATOR LIGHT AND MANUAL TEST DEVICE**

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[52] **U.S. Cl.**..... **219/528,** 200/168 G, 219/506, 219/535, 340/252 P

[51] **Int. Cl.**..... **H05b 3/36,** H05b 3/56

[58] **Field of Search** ..... 200/168 G; 219/528, 506, 219/535, 549; 338/214; 340/252 R, 252 H, 252 P

[56] **References Cited**

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[57] **ABSTRACT**

An elongated flexible electrical resistance heating cable adapted to be wrapped about water pipes and for other similar uses. A cold lead extends to the cable and a thermostat is interposed between the cold lead and the cable with a translucent and flexible envelope thereabout. A small indicator light within a second translucent envelope is connected in parallel with the heating cable and operates to reflect visually operation of the thermostat. A test device in the first envelope comprises a small spring metal conductor connected at one end with one thermostat terminal and having an opposite end movable toward and away from a second thermostat terminal. Manual deflection of the envelope against the conductor urges the same into contact with the terminal whereby to close the circuit for testing of the heating cable and release of manual pressure opens the circuit.

3 Claims, 3 Drawing Figures

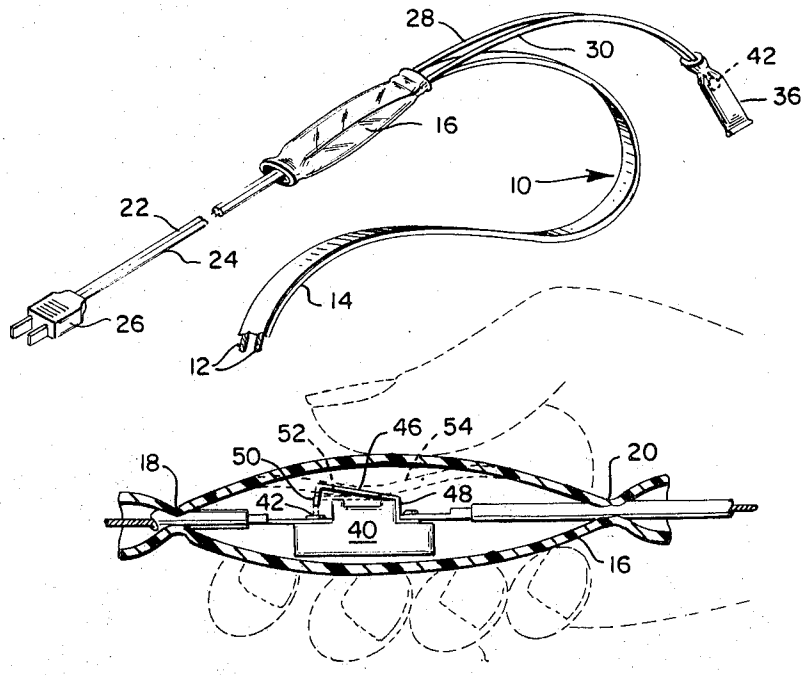


FIG. 1

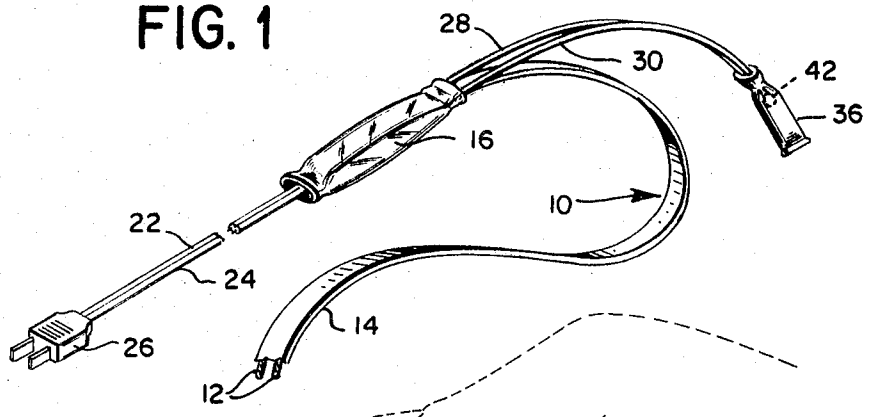


FIG. 2

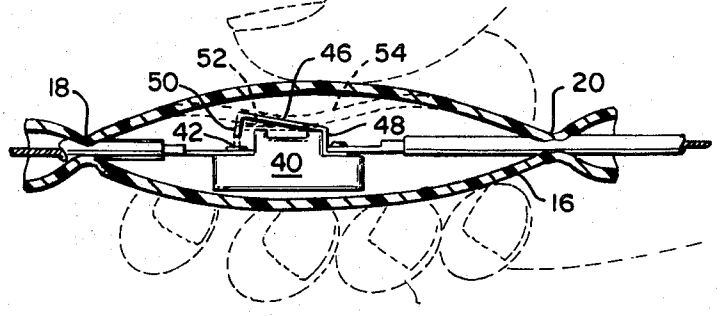
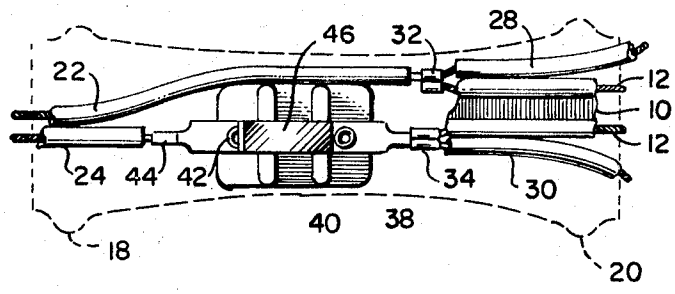


FIG. 3



ELECTRICAL HEATING CABLE WITH INDICATOR LIGHT AND MANUAL TEST DEVICE

BACKGROUND OF THE INVENTION

Electrical heating cables of the resistance type have been available heretofore and have proven generally satisfactory. A convenient determination of availability of electrical power, operability of the thermostat, and operability of the resistance heating element has not, however, been possible with such heating cables, the cables often being disposed about water pipes beneath house trailers and in other inaccessible locations.

SUMMARY OF THE INVENTION

It is the general object of the present invention to provide an electrical resistance heating cable of the type mentioned wherein provision is made for the convenient visual indication of the availability of electrical power supply, operability of a thermostat, and wherein the operability of the resistance heating element may be readily ascertained.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of an electrical resistance heating cable assembly constructed in accordance with the present invention.

FIG. **2** is an enlarged fragmentary vertical section through a first substantially translucent envelope and a thermostat and test device therewithin.

FIG. **3** is an enlarged fragmentary horizontal view through the envelope and showing the thermostat and test device.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring particularly to FIG. **1**, an electrical resistance heating cable is indicated generally at **10.** The cable takes a tape-like form in cross section with electrical resistance heating element **12** disposed therewithin and a flexible insulator **14** forming the sheath or outer portion thereof. Both the resistance heating element and the insulator **14** are elongated and of indeterminant length extending from a substantially translucent first envelope **16.** The cable or tape **10** may obviously be wound conveniently in a spiral configuration about a water pipe subject to freezing temperatures, embedded in seed beds, etc.

The translucent envelope **16,** as best illustrated in FIG. **2,** takes a pillow configuration and is preferably heat sealed at end portions **18, 20** about and in engagement with the cable **10** and other elements. In FIG. **3,** and at the left-hand heat sealed area **18** in particular, a cold lead **22, 24** is captured within the heat sealed area and extends therefrom to a conventional electrical plug **26,** FIG. **1.** The right-hand heat sealed area **20** captures, in addition to the heating cable **10,** first and second electrical conductors **28, 30** which extend from clips **32, 34** to a second substantially translucent envelope **36,** best illustrated in FIG. **1.** The clips **32, 34** serve respectively to connect the conductors **28** and an associated end portion of resistance element **12** with the cold lead **22** and, to connect the conductor **30** and associated opposite end portion of resistance element **12** to a terminal **38** on a thermostat **40.** Thus, the resistance heating element **12** is connected in parallel with pilot or indicator means or lamp **42** within the translucent envelope **36** by means of the conductors **28, 30.**

The thermostat **40** may be of a conventional construction and operates to energize the heating element **12** below a predetermined temperature whereby to prevent freezing of water pipes or to effect heating of the element **12** for other end purposes. Preferably and as shown, the thermostat **40** has at least one exposed terminal and, left and right-hand or first and second exposed terminals are shown. The left-hand terminal **42** is exposed for a purpose to be set forth hereinbelow and the aforementioned terminal **38** may also be exposed. The cold lead **24** is connected with the left-hand terminal **42** by means of a suitable clip **44.**

A test device incorporated in the heating cable assembly of the present invention is preferably manually operable and may comprise a spring metal conductor as illustrated at **46.** The spring metal conductor **46** has a right-hand portion **48** connected with the thermostat terminal **38** and a left-hand portion **50** normally in spaced relationship with the thermostat terminal **42.** An intermediate portion of the conductor **46** can be urged downwardly as illustrated by broken line **52** in FIG. **2** whereby to make contact between the exposed terminal **42** and the portion **50** and to complete a circuit in parallel with the thermostat **40.** As best illustrated in FIG. **2,** the intermediate portion of the spring metal conductor **46** is urged downwardly by manual depression of the translucent envelope **16,** illustrated by broken line **54.**

From the foregoing, it will be apparent that the heating cable **10** may be wrapped about a water pipe, the plug **26** inserted in a suitable receptacle for a supply of electrical power and the heating cable assembly will thereafter operate automatically to prevent freezing of water in a pipe. The thermostat **40** will serve to energize the heating element **12** when ambient temperature drops below a predetermined level and to de-energize the heating element when the ambient temperature exceeds such level. When the thermostat closes the circuit to energize the heating element, it also energizes the indicator or pilot lamp **42** and an observer can readily determine visually the closed or operative condition of the thermostat. When the indicator or pilot light **42** is de-energized, the observer is advised of the open or inoperative condition of the thermostat. The conductors or leads **28, 30** for the indicator or pilot light **42** permit the orientation or positioning of the pilot light externally of insulation wrapping which may be placed about the heating cable **10** on a water pipe. This of course permits a convenient visual inspection of the heating cable assembly for operability.

In testing operation of the heating cable assembly, the plug **26** may be introduced to a convenient receptacle and the test device **46** may thereafter be manually depressed as indicated in FIG. **2** in the broken line condition whereby to engage the portion **50** of the test device with the exposed thermostat terminal **42.** A parallel circuit is thus completed and the indicator light **42** will be energized to advise an observer as to the availability of electrical power. Further, the resistance element **12** will be energized and an observer may thereafter place his hand upon the heating cable **10** to ascertain with certainty the operability of the cable.

I claim:

1. An electrical heating cable assembly comprising:

a relatively thin, flexible heating cable including an elongated electrically conductive resistance heating element embedded in an elongated flexible insulator;

a thermostat electrically connected adjacent said heating element for controlling energization of the latter and having at least one exposed terminal;

visual indicating means comprising a small indicator light enclosed within a substantially translucent indicator envelope,

said visual indicating means being electrically connected to said thermostat and heating element and operable on closing of said thermostat for indicating energization of said heating element;

a test device electrically connected in parallel with said thermostat and operable manually to energize temporarily said heating element and indicating means,

and a substantially translucent envelope disposed about said thermostat and test device,

said test device comprising a movable metal conductor electrically connected at one end with one side

of said thermostat and having its other end disposed adjacent said exposed terminal,

said other end of said conductor being normally spaced from said exposed terminal to open a circuit parallel with said thermostat,

and said other end of said conductor being urged into contact with said exposed terminal to complete said parallel circuit on the application of manual pressure to an intermediate portion of the conductor via said translucent envelope.

2. An electrical heating cable as set forth in claim **1** wherein;

said translucent envelope has at least one flexible wall disposed adjacent but in spaced relationship with said test device,

said wall being flexible inwardly on the application of manually applied pressure for operation of said test device as aforesaid.

3. An electrical heating cable as set forth in claim **1** wherein said conductor is of a spring metal construction and flexibly movable.

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