

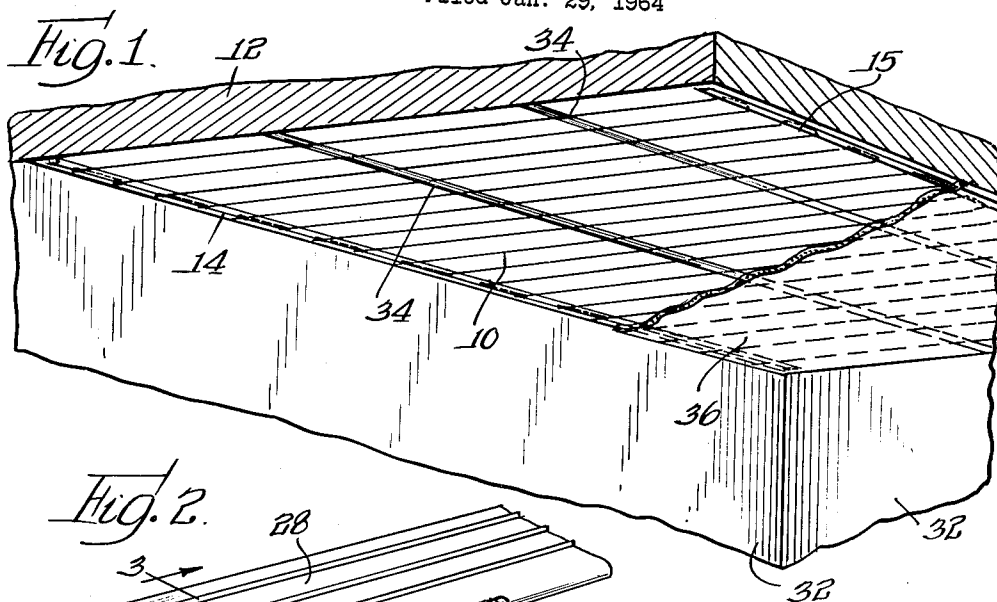
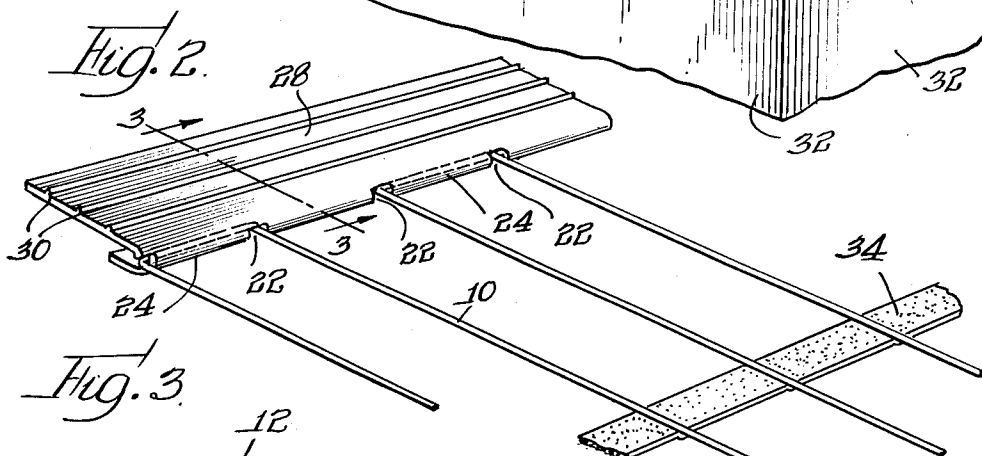
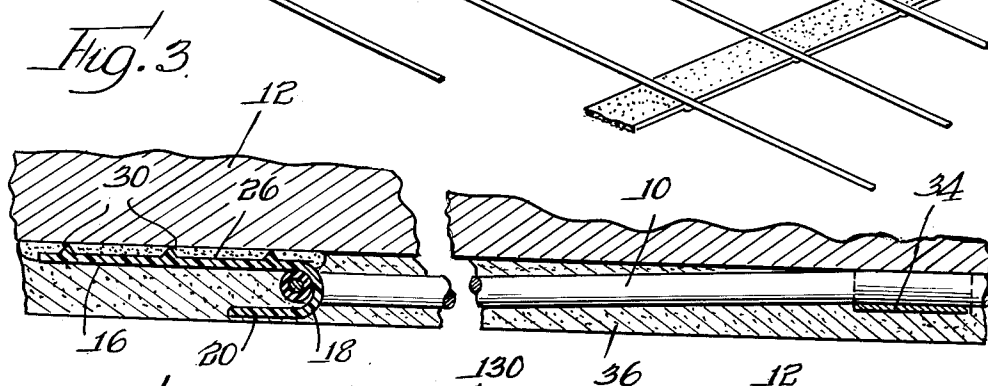
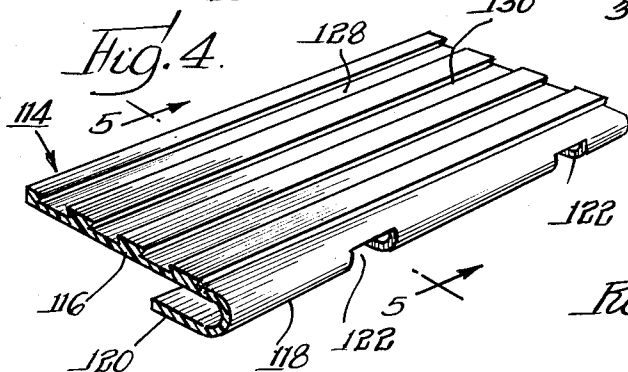
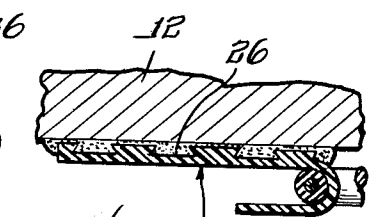
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3,200,236

RADIANT HEATER CONSTRUCTION

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RADIANT HEATER CONSTRUCTION

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5 Claims. (Cl. 219-213)

This invention relates to a radiant heater construction and more particularly to a construction which holds electric heating cable in position with support strips to facilitate construction, and the cable and strips are covered with plaster to provide an attractive, smooth ceiling.

Of the various methods of heating buildings, radiant heating has achieved a substantial amount of acceptance because of the uniformity of heat which it produces. Radiant heat has been produced by embedding water tubes in a floor or in a ceiling. The use of water tubes in a ceiling has been found to be desirable from the heating standpoint; however, the tubes present problems in construction. Furthermore, there must be a hot water heating plant in association with the heating system. A more desirable form of producing radiant heat is to have electric heat cables embedded in a ceiling so that the heating energy is converted from electric energy to heat energy in the ceiling, and subsidiary heating plants are not required. The ordinary way of embedding heating cables in a ceiling is to prepare a ceiling construction, such as, a concrete slab, and then to attach a cable to the concrete slab by means of an adhesive tape or some other convenient means. The cable is then covered with a quarter of inch thick layer of plaster, which plaster adheres to the concrete slab and holds the cable in position. It may be appreciated that the electrical cable must be positioned in a prescribed form.

At the present time, a form is held adjacent to the ceiling at opposite ends of a room to form the cable. The cable is then strung onto the form from one end of the room to the other in a serpentine fashion, and adhesive tape is applied to the cable and to the concrete ceiling slab to attach the cable to the ceiling slab. The form is then removed from the ceiling and the cables. It may be appreciated that the released ends of the cables have a tendency to hang down due to gravity. The ends of the cable then must be individually attached to the ceiling slab with adhesive tape. It may be readily appreciated that it is desirable to provide a means for holding the heating cable in a desired form during stringing of the cable and to hold the ends of the cable up so that it is not necessary to tape up individually each loop of the cable. It is, therefore, a principal object of the instant invention to provide an economical radiant heater construction in which support strips are fixed to a ceiling member, a heating cable is positioned in the strips to place the cable in a desired form, and plaster holds the cable adjacent to the slab and provides a smooth surface.

It is a further object of this invention to provide an electric heating cable support which may be attached to a ceiling construction to hold a cable in a desired position and which support is not electrically conductive so that it may be embedded in a plaster coating to remain there for the life of the ceiling.

It is another object of the present invention to provide an elongated electric cable support strip which may be conveniently attached to a ceiling construction and which holds an electric heating cable in a desired configuration.

It is a still further object of the present invention to provide an elongated support strip which is inexpensive to manufacture and is convenient to use on a construction site.

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Other objects and uses of the herein-disclosed invention will become readily apparent to those skilled in the art upon a perusal of the following specification in light of the accompanying drawing in which:

FIGURE 1 is a perspective view of a portion of a room showing an electric heating cable attached to a ceiling slab with a strip holding a portion of the cable in position and plaster shown as being partially removed to show better the construction of the radiant heater;

FIGURE 2 is an enlarged perspective view of a portion of the cable and a portion of one of the strips shown in FIGURE 1;

FIGURE 3 is a cross-sectional view showing the strip of FIGURE 2 attached to a ceiling slab with a portion of the cable positioned in the strip and plaster covering the cable and strip;

FIGURE 4 is a perspective view of a fragmentary portion of a strip similar to the strip shown in FIGURES 2 and 3, but with a slotted adhesive surface; and

FIGURE 5 is a cross-sectional view taken on line 5-5 of FIGURE 4 showing the strip of FIGURE 4 attached to a ceiling slab and with a cable positioned in engagement with the strip, but without plaster applied.

Referring now to the drawing and especially to FIGURE 1, a portion of a room ceiling is shown with a portion of a radiant heater construction embodying the present invention as a part of the ceiling. An electric heating cable 10 is attached to a concrete ceiling slab 12. An elongated strip 14 is attached to one edge of the ceiling slab 12 and a second strip 15, which is identical to the strip 14, is attached to the opposite edge of the slab. The cable 10 is alternately looped on strips 14 and 15 in a generally serpentine form to be held in that form.

As was mentioned above, strips 14 and 15 are identical and a detailed description of strip 14 also applies to strip 15. The strip 14 is made of an extruded rigid polyvinyl chloride so that the strip is an electrical insulator. The strip 14 includes an elongated flat base 16 which has a curved portion 18 formed integral with one edge of the base. The curved portion 18 includes a lip 20 which is substantially parallel to the base 16 to form a generally U-shaped cross-section. The curved portion 18 has a plurality of slots 22 cut therein so that the curved portion forms a plurality of hooks 24 which are formed integral with the base thereby forming a cable holding portion in which the slots provide entrances for the cable.

As was mentioned above, the strips are attached to the ceiling slab 12. The strips are attached to the ceiling slab by an adhesive 26 which is applied to the base 16. The base 16 has an irregular surface 28 for receiving the adhesive. In order to form an irregular surface on the base, a plurality of elongated ridges 30 are formed integral with the base. It is, therefore, readily apparent that the adhesive 26 fills the spaces between the ridges to secure the strip to the ceiling slab and the distance from the irregular surface 28 to the outermost surface of lip 20 is one quarter of an inch for reasons which will become apparent hereinafter.

By using the strips 14 and 15, electric heating cable 10 may be installed in a building construction quite simply and efficiently. As is conventional, the ceiling slab 12 is installed by conventional means and walls 32 are partially prepared. Ceiling strips 14 and 15 are secured to the ceiling slab 12, which acts as a ceiling support member, at opposite ends of a room in a manner substantially as shown in FIGURE 1. It should be noted that the strips are fixed to the slab with their respective cable holding portions adjacent to each other though spaced

from each other by the distance the cable is to be strung. The strips 14 and 15 are attached to the ceiling slab by applying adhesive 25 to the irregular surface 28, and then the strip is placed on to the ceiling slab. It may be appreciated that adhesive may be forced out from between the surface 28 and the ceiling slab, but the irregular surface of the base provides a pocket which holds adhesive. After the ceiling strips are in position and the adhesive has set, the cable 10 is placed into position. The cable 10 is placed in a slot 22 of strip 14 and brought over to the next slot 22 of the same strip and strung along the ceiling to strip 15 on the opposite end of the slab. The cable is placed in strip 15 in the same manner as in strip 14 and then brought back to the strip 14 where it is again placed into engagement with the strip 14 as described above. It may be appreciated that, though the instant strip has slots on one inch centers, the slots may be on three quarters of inch centers or any other desired spacing. It should also be noted that the cable has its loop portions completely covered by the curved portion 18 and lip 20. Furthermore, the loops may extend over several slots depending upon the particular application and all of the loops are covered by the strip lips.

After the cable 10 has been strung, it may be appreciated that the cable will sag slightly due to its own weight. In order to place the cable immediately adjacent to slab 12, strips of a pressure sensitive adhesive tape 34 are attached to the cable and the ceiling to hold the cable adjacent to the ceiling slab. Once the cable is secured to the ceiling slab, the construction may be completed. A coat of plaster 36 approximately one quarter of an inch thick is applied to the ceiling slab. The plaster 36 covers the cable as well as the strips to bond the cable to the ceiling slab and to cover the cable and strips thereby hiding the cable and strips in the ceiling construction and presenting a smooth and attractive ceiling. It may be appreciated that the cable is connected to a suitable source of electrical energy to produce radiant heat from the ceiling as desired. It should be noted that it is imperative that the strips 14 and 15 be of a material which is electric insulator, so that should insulation on the cable 10 break, there is no opportunity for a short to occur.

The use of polyvinyl chloride as the material for a strip has a particular advantage in the strip does not cut the insulation on the cable when the cable is placed into engagement with the strip and drawn taut. This particular feature is important in the usage of the strip, because it is particularly desirable to make the cable as tight as possible to eliminate as much sag as possible and this may be done without damage to the insulation of the cable.

Looking now to FIGURES 4 and 5, a strip 114 is shown therein. The strip 114 is substantially identical in construction to strip 14 inasmuch as it is also made of rigid polyvinyl chloride and has elongated flat base 116. A curved portion 118 is formed integral with one edge of the base and a lip 120 is formed integral with the curved portion. The curved portion has a plurality of slots 122 which slots are identical to slots 22 of strip 14. The strip 114 has an irregular adhesive surface 128 which distinguished strip 114 from strip 14. The irregular surface 128 contains a plurality of elongated key slots 130, which are particularly adapted to receive an adhesive therein, which adhesive holds the strip 114 onto a ceiling slab. It is thus evident that the construction of strip 114 is identical to the construction of strip 14 with the exception of the construction of the irregular adhesive surface.

Looking now to FIGURE 5, it may be seen that strip 114 is attached to ceiling slab 12 by adhesive 26 which adhesive fills up the grooves 130. The strip 114 is attached to the ceiling slab in the same manner that strip 14 is attached, and the strips are used in an identical manner.

Although a specific embodiment of the herein-disclosed

invention has been shown and described above in connection with a ceiling slab construction, it is readily apparent that those skilled in the art may use the present invention in connection with other types of ceiling constructions and make various modifications and changes without departing from the spirit and scope of the present invention. It is to be expressly understood that the instant invention is limited only by the appended claims.

What is claimed is:

1. A radiant heater construction included in a ceiling comprising: a pair of extruded elongated support strips spaced from each other and fixed to the ceiling, each of said support strips having an elongated curved electrically insulating cable holding portion having a generally U-shaped cross-section, each of said portions having a plurality of slots extending through one arm of the respective V-shaped section and a portion of the respective bottom of the U, and a substantially flat base being formed integral with the other arm of the U and extending in a direction opposite to the other support strip; an electrical heating cable extending between the support strips in a serpentine fashion with a loop at each cable holding portion, and plaster covering the cable and the support strips to hold the cable in position and to form a smooth surface for the ceiling.

2. An extruded elongated support strip comprising, an elongated curved electrical insulating cable holding portion having a generally U-shaped cross-section, said cable holding portion having a plurality of slots extending through one arm of the U-shaped section and a portion of the bottom of the U, and a substantially flat base being formed integral with the other arm of the U.

3. In a building construction for including a radiant heater on a ceiling, the combination comprising; an elongated support strip having an elongated substantially flat electrical insulating base fixed to a ceiling support member, a curved cable holding portion formed integral with one edge of said base, and said curved portion having a plurality of slots for receiving cable held by the curved portion; a second elongated support strip fixed to a ceiling support member and spaced from the first mentioned elongated support strip, said second elongated support strip including a second elongated substantially flat electrical insulating base, a second curved cable holding portion formed integral with one edge of said second base adjacent to the first mentioned elongated support strip; and said second curved portion having a second plurality of slots for receiving cable held by the second curved portion; an electrical heating cable extending between the curved cable holding portions in a serpentine fashion with a loop at each curved portion; and plaster covering the cable and the support strips to hold the cable in position and to form a smooth surface for the ceiling.

4. In a building construction for including a radiant heater on a ceiling, the combination comprising; a pair of elongated support strips spaced from each other and fixed to the ceiling, each of said elongated support strips being extruded rigid polyvinyl chloride having a substantially flat electrical insulating base having a plurality of grooves on one side thereof adjacent to the ceiling to provide an adhesive holding surface, a curved cable holding portion having a generally U-shaped cross-section formed integral with the edge of said base adjacent to the other support strip and extending over the side of the respective base opposite the side having the grooves, and said curved portion having a plurality of slots transverse the respective grooves; an electrical heating cable extending between the curved cable holding portions of the support strips in a serpentine fashion with a loop at the curved portions and being positioned in the slots to space the cable; an adhesive tape attached to the cable and to the ceiling between the support strips to hold the cable adjacent to the ceiling; and plaster covering the cable,

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the tape and the support strips to hold the cable in position and to form a smooth surface for the ceiling.

5. A support strip comprising an electrical insulating elongated substantially flat base, said base having an irregular surface on one side thereof to provide a surface for receiving an adhesive material, an elongated curved cable holding portion having a generally U-shaped cross-section having one arm of the U-shaped cross-section formed integral with the base, and said cable holding portion having a plurality of slots extending through the other arm of the U-shaped section and a portion of the bottom of the U.

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RICHARD M. WOOD, *Primary Examiner.*

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,200,236

August 10, 1965

Robert C. Geyer

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 18, for "V-shaped" read -- U-shaped --.

Signed and sealed this 22nd day of February 1966.

(SEAL)

Attest:

ERNEST W. SWIDER

Attesting Officer

EDWARD J. BRENNER

Commissioner of Patents
