July 16, 1957 C. H. BECKER 2,799,481

UNIT FOR A HEATING FLOOR

Filed July 29, 1953

Fig. 1

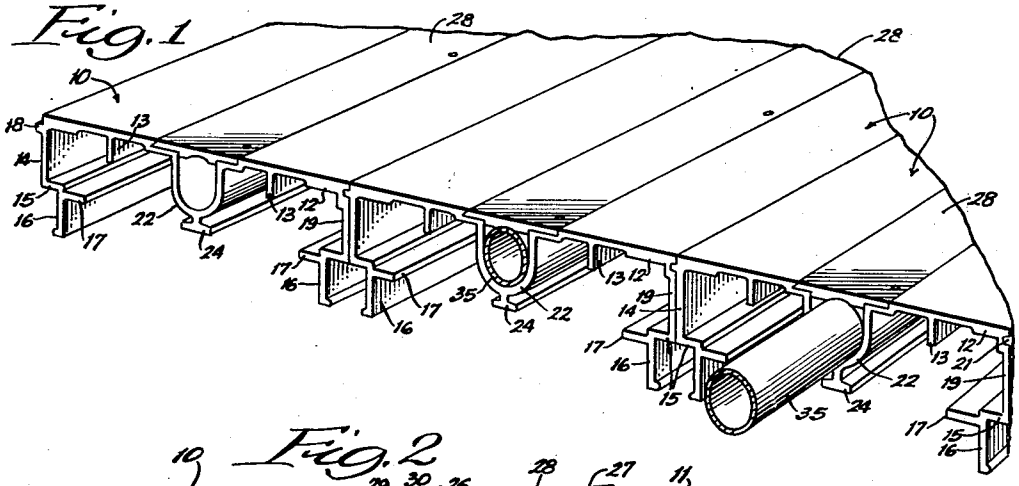


Fig. 2

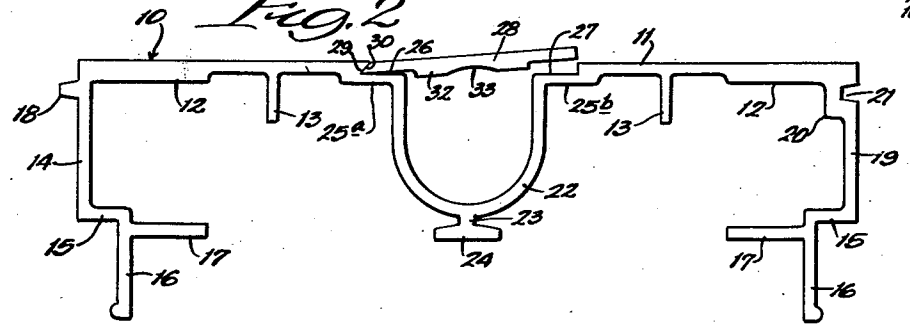
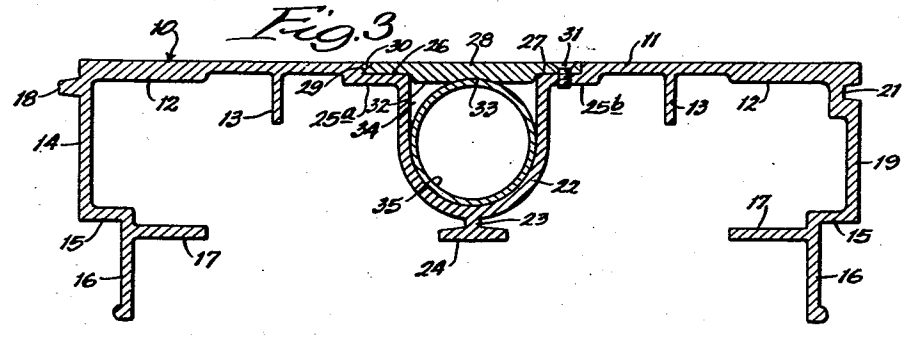


Fig. 3



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United States Patent Office

2,799,481

Patented July 16, 1957

2,799,481

UNIT FOR A HEATING FLOOR

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Application July 29, 1953, Serial No. 370,912

6 Claims. (Cl. 257—124)

This invention relates to a unit for a heating floor and more particularly to a heating floor unit equipped with means for supporting heating coils. The invention is particularly useful in providing a heated floor for a house trailer, truck trailers, automobiles, etc. The invention is, however, also useful in connection with other platforms or floor structures. The present application is a continuation-in-part of my co-pending application Serial No. 340,080 for Heating Floor Unit filed March 3, 1953.

In heating floors such as for example those used in house trailers, provision is made for the flow of heating fluid which in its path of circulation transfers heat to the floor and thereby heats the floor and the space thereabove. Desirably, the hot water or other heating fluid circulates through conduits carried by the floor. Although such conduits have relatively long life, they do at times require servicing and it is desirable to make the conduits accessible. Further, in installation, the conduits are spaced apart throughout the floor and must be interconnected and therefore accessibility and convenience of location is also advantageous at this time. The floor structure provided, however, must be substantially flat and the supported heat conduits cannot then be supported so as to offer obstructions, etc. that would make the floor or platform uneven. At the same time the conduits that carry the heating fluid must be positioned so that good thermal conductivity with the floor is provided.

It is accordingly an object of this invention to provide a heating floor structure having the attributes indicated above as being desirable. Another object of the invention is to provide a unit for a heating floor which may be secured readily within a house trailer or other structure while effectively supporting heating coils to bring about a heat transfer to the top surface of the floor. Still another object is in the provision of a heating floor unit wherein accessibility of the heating conduits carried thereby is assured and at the same time the floor or platform is substantially flat. A further object is in providing a unit for a heating floor that carries a depending channel accessible from the top surface of the floor and that is suitable for carrying a heating conduit. Yet a further object is to provide an extruded floor structure which may be produced at low cost while providing support means for heating conduits; accessibility being provided to the conduits through a removable cover panel that forms with the top surface of the unit a substantially flat platform surface. Additional objects and advantages will appear as the specification proceeds.

An embodiment of the invention is illustrated in the accompanying drawing in which Figure 1 is a broken perspective view of a plurality of floor units joined together and that embody my invention; Figure 2 is an end view in elevation of a heating floor unit embodying my invention and in which the cover panel is shown in an intermediate position; and Figure 3 is a transverse sectional view of a heating floor unit embodying the invention.

In the illustration given in Figs. 1 through 3 I provide a heating floor unit or section that is designated generally with the numeral **10**. In the illustration of Fig. 1 three of the sections **10** are joined together to provide a floor or platform in a manner that will be subsequently described. Each of the units **10** provides a top platform or panel portion **11**. I prefer to form the section **10** by extrusion, although it will be apparent that other means of formation may be used readily. Further, I prefer to form the units **10** from aluminum or aluminum alloys. If desired, however, the units may be formed of other materials such as plastics or composition materials and further, if extrusion means are provided for forming the section the materials selected should be those that may be effectively extruded to form a sturdy unit.

The top platform or panel portion **11** is provided along each side with thickened areas or depending ribs **12**. Also, the units **10** are equipped with reinforcing beams **13** of relatively small depth. The beams **13** may be spaced as required and preferably extend longitudinally of the unit **10**.

Integrally formed with the top platform **11** along one side thereof is an end wall or beam **14** of substantially greater depth than the beams **13**. The wall **14** is equipped with a laterally or inwardly-turned horizontal brace **15** having reinforcing flanges **16** and **17** formed integrally therewith. The wall **14** is also provided with an outwardly projecting ledge or tongue **18** that is preferably positioned adjacent the lower surface of the thickened area **12**.

Along the opposite side of the unit **10** is a depending wall or beam **19** that is enlarged at the top end **20** thereof and provides a groove or socket **21** therein. The wall **19** is also equipped with an inwardly-extending brace **15** and flanges **16** and **17**. Preferably, the wall **19** is formed integrally with the top panel **11** and the recess **21** extends longitudinally thereof. It will be noted in Figs. 2 and 3 that the groove or recess **21** tapers inwardly to reduced cross section and the tongue **18** on the opposite wall **14** also tapers outwardly. The tongue **18** is adapted to be received within the groove **21**.

In the formation of a floor structure or platform such as the one indicated in Fig. 1 a plurality of the units **10** are brought together so that the tongue **18** provided by each unit is received within the socket **21** provided by the adjacent unit. The tongue **18** and socket **21** provide an interlock that securely joins the individual units **10** together. The units **10** forming the floor structure may be supported in any suitable manner and, for example, reference may be made to my pending Serial Number 340,080 for a specific example of a support structure and means that may be employed.

The unit **10** is equipped centrally with a depending generally U-shaped channel or passage **22** having along the lower surface thereof a reinforcing rib **23** with an enlarged lower portion **24**. Preferably, the walls of the U-shaped channel member **22** depend from the offset portions **25***a* and **25***b* of the top panel **11**. These offset portions **25***a* and **25***b* provide horizontal shoulders **26** and **27** that support thereon a removable cover or panel **28**. As is clear from Figs. 2 and 3, the cover panel **28** is provided along one longitudinal edge thereof with an inclined or tapered edge portion that is received within a tapered or undercut portion **29** provided between the shoulder **25***a* and top surface of the panel **11**. The tapered edge provided by the removable cover is designated as the numeral **30**. On the opposite side thereof the cover panel **28** rests upon the shoulder **27** and, if desired, cap screws **31** extending through the cover panel and threadedly received within the undercut portion **25***b* may be provided for rigidly securing the cover plate in position upon the shoulders. The cover plate **28** is enlarged cen-

trally at 32 and the undersurface of the enlarged portion 32 has an arcuate recess 33 therein as is seen best in Fig. 2. The recess 33 extends longitudinally of the cover plate 28 and is centrally positioned along the undersurface thereof. The U-shaped channel member 22 extends longitudinally of the unit 10 and it provides with the cover plate 28 a compartment or receptacle 34 adapted to receive a conduit or heating coil 35 therein. As is clear in the drawing, the conduit 35 is snugly received within the walls of the U-shaped channel member 22 and snugly engages the longitudinal recess 33 provided in the cover panel 28.

As is seen in Figure 1, each of the sections or units 10 is provided with a depending channel member 22 and each of the channel members supports an elongated conduit or heating tube 35 therein. The tubes 35 are adapted to have circulating therethrough a heating fluid such as hot water or steam, etc. To accomplish this result it is necessary that the tubes 35 be interconnected and the interconnection between the tubes is accomplished by providing arcuate connecting sections or elbows at the ends of the tubes. It will be clear that the hot heating fluid flowing from the heater will enter the tubes at at least one section and will be returned to the heater after having circulated through the various conduits. If it is desired to refer to a specific example of the tubular heating coils when connected, reference may be made to my Patent No. 2,483,721.

In operation of the structure a plurality of units 10 are joined together to provide a continuous platform or floor such as that illustrated in Fig. 1. Any number of units 10 may be combined to form a floor of required size. In each case the projecting tongue 18 of one unit will be received within the recess 21 of an adjacent unit. The units 10 may be supported within a house trailer or other structure in any suitable manner as has been heretofore brought out.

When the units 10 are appropriately supported in interlocking relation to provide the floor or platform, the covers 28 are removed and the conduits 35 placed within the depending U-shaped channel members 22. In this operation, it is unnecessary to thread or slide the elongated tubes into position through a single opening and instead the tubes 35 may be positioned easily and accurately by simply placing them within the channels through the opening provided when the removable covers 28 have been lifted from the units. Thereafter the tubes are interconnected by elbows, etc. as required and then the covers 28 are placed in position. The undercut portion 29 and mating edge portion 30 operate to securely hold the covers 28 in position upon the shoulders 26 and 27. If it is thought necessary, cap screws 31 may be used to securely tighten the cover members 28 downwardly upon the shoulders.

It will be appreciated that when it is necessary to service the tubes 35, the covers 28 may be quickly and easily removed by simply removing the cap screws 31 if they are used and then lifting the covers 28 from position to lay open the tubes 35 positioned therebelow.

It is apparent that the covers 28 provide with the top panels 11 a substantially continuous and flat surface having no upward projections or obstructions that would interfere with the functioning of the units 10 as desirable floors or platforms. At the same time, excellent heat transfer between the conduits 35 and U-shaped members 22 and top cover panels 28 is provided in that the tubes are snugly received within the depending members 22 and are in thermal contact therewith throughout a substantial portion of their peripheries. At the same time a portion of the periphery of each tube is in thermal contact with the cover plate 28 due to the abutment between the tube and the arcuate recess 33 provided by each cover plate. Thus the cover plates are readily heated as are the floor areas thereabout by transfer of the heat through the walls of the U-shaped channel members 22 upwardly to the top panels 11.

It will be apparent that suitable insulation may be provided below and about the U-shaped channel members 22 and further, reflecting materials may also be provided that are operative to reflect the heat from the channel members 22 upwardly and toward the top panel 11. Preferably, the units 10 are formed by extrusion and an integral unit may be provided by this method.

While in the foregoing specification I have set out the embodiment of the invention in considerable detail for the purposes of illustration, it will be apparent to those skilled in the art that considerable deviations from these details may be made without departing from the spirit and principles of the invention.

I claim:

1. In a heating floor unit, a top panel equipped with an integral depending channel of generally U-shaped configuration, said channel having an open top and being adapted to receive a cylindrical tube therein and to engage such tube over an extended surface area thereof, and a cover panel in covering relation with the open top of said channel and having an arcuate recess extending longitudinally therealong adapted to tightly engage the surface of a tube positioned within said channel to constrain the tube against movement within said channel.

2. In a heating floor structure adapted for use in vehicles, a top panel provided intermediate the ends thereof with an integral depending channel having an open top, and a cover panel carried by said top panel in covering relation over the open top of said channel and forming a continuation of said top panel, said channel having a semi-cylindrical lower end portion and said cover panel having a recess in facing relation therewith, the curvature of said recess being a continuation of the arc of said semi-cylindrical portion of the channel whereby a heating tube of cylindrical configuration received within said channel and having a diameter corresponding to that of said semi-cylindrical portion is rigidly constrained within said channel by said cover panel.

3. The structure of claim 2 in which said channel along the bottom thereof is equipped with an integral reinforcing rib extending longitudinally therealong.

4. The structure of claim 2 in which said top panel is provided with a pair of offset inset shoulders, one along each edge of said channel, one of said shoulders having an inwardly and upwardly inclined wall defining a tapered slot, said cover panel being seated upon said shoulders and having a beveled edge defining a tongue received within said slot, the top surface of said cover panel being in planar relation with the upper surface of said top panel.

5. In a heating floor section having a generally planar top panel, said top panel being provided intermediate the ends thereof with an integral depending channel adapted to receive a heating tube therein and having an open top, said top panel being recessed along each edge of said channel to define shoulders spaced below the upper surface of the top panel, an edge of one of said shoulders being inclined upwardly and inwardly thereby forming an undercut, a cover panel constructed and dimensioned to be supported upon said shoulders with the upper surface thereof forming a continuation of said top panel, said cover panel along one edge thereof having a tapered tongue receivable within said undercut whereby the cover panel in closed position is constrained along one side by said undercut, and means cooperating with said cover panel and the other of said shoulders for locking the cover panel in closed position.

6. The structure of claim 5 in which said channel has a semi-cylindrical configuration along the bottom portion thereof and in which said cover panel has an arcuate recess along the underside thereof, said recess

having the same radius as said semi-cylindrical configuration and the same center, and a heating tube mounted within said channel and being engaged over a substantial surface portion thereof by the semi-cylindrical configuration of said channel and by said arcuate recess whereby said tube is clamped within said channel when the cover is closed.

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