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[54] **COVER FOR CHANNELS AND DUCTS**

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Related U.S. Application Data

[63] Continuation of Ser. No. 262,074, June 12, 1972, abandoned.

[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.** **404/35;** 280/106

[51] **Int. Cl.²** **E01C 5/16**

[58] **Field of Search** 404/35; 52/588, 584; 160/133

[56] **References Cited**

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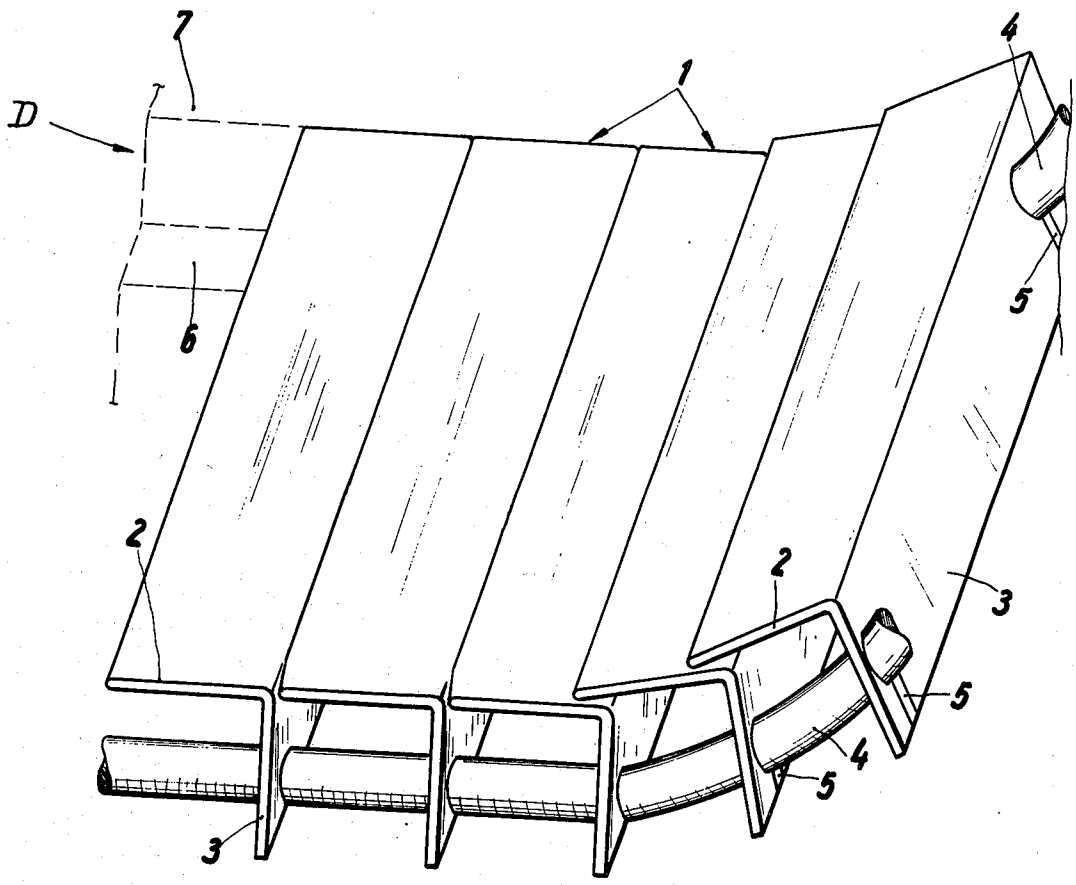
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Primary Examiner—Mervin Stein
Assistant Examiner—Steven Hawkins

[57] **ABSTRACT**

A cover for a floor channel or duct for services is comprised of transverse metal, preferably inverted, L-shaped bars flexibly connected together by wires running lengthwise of the duct so that the cover can be simply rolled up and unrolled to uncover and re-cover the duct. In the laid condition, the horizontal flange of each bar is supported by the vertical flange of the next bar, and the vertical flanges are supported on the duct frame with the upper surfaces of the horizontal flanges flush with the floor surface.

6 Claims, 3 Drawing Figures



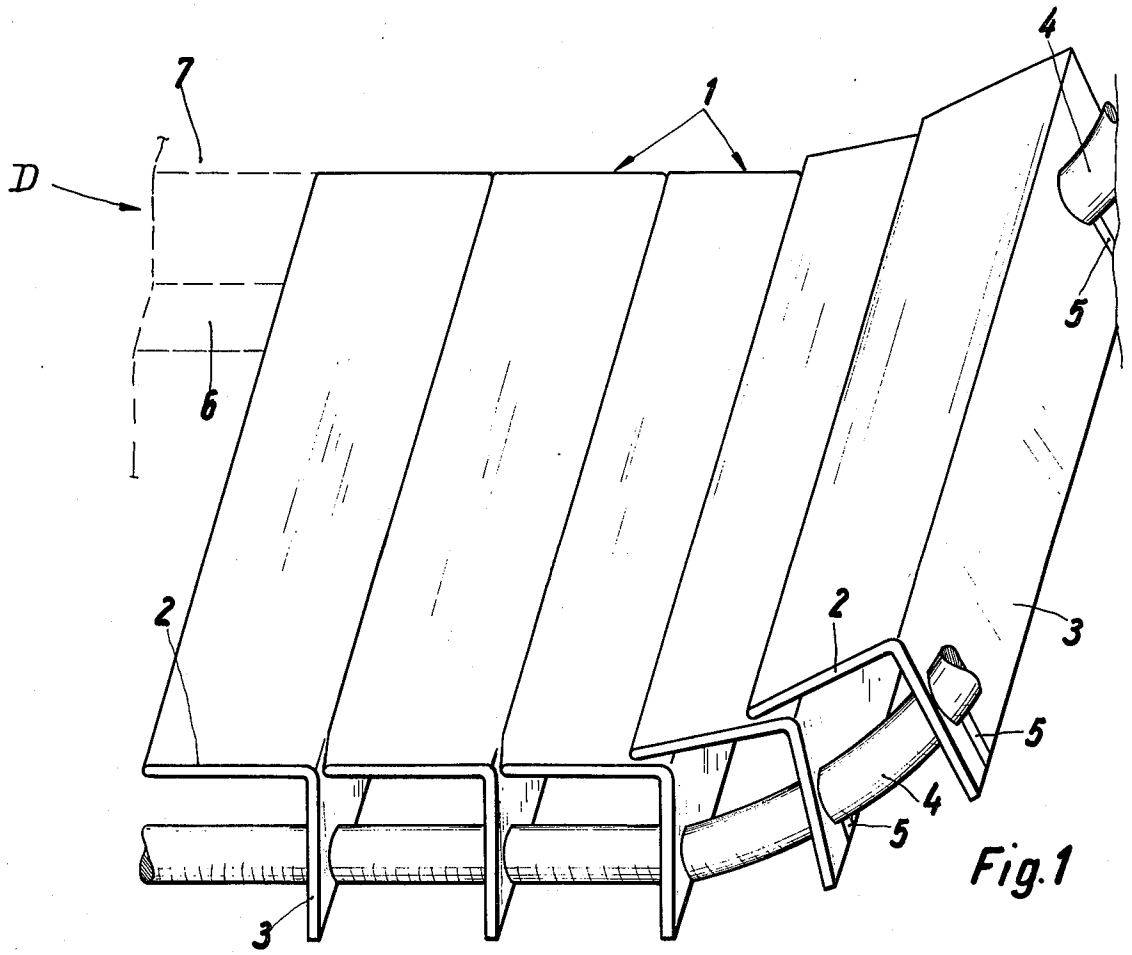


Fig.1

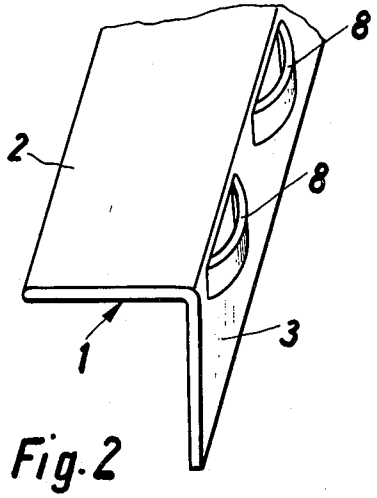


Fig.2

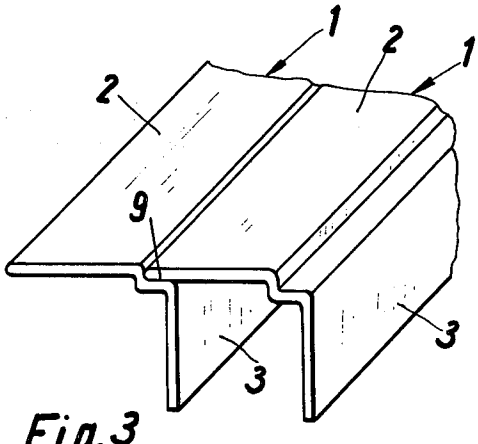


Fig.3

COVER FOR CHANNELS AND DUCTS

This is a continuation of application Ser. 262,074, filed June 12, 1972, and now abandoned.

This invention is related to that disclosed and claimed in applicant's copending application Ser. No. 14,328, now U.S. Pat. No. 3,685,403, dated Aug. 22, 1972.

The present invention relates to covers for channels and ducts, for example cable and pipe ducts formed in a floor surface. Covers of this kind are generally required to close off the channel or duct and to present upwardly a flat surface in the general plane of the floor surface, such flat surface having a relatively high load-bearing capacity.

Covers for this purpose have hitherto been formed in the following manner: (a) Because of the requisite load-bearing capability, thick iron plate or iron panels are used. However, stresses or unfavourable loading conditions can give rise to distortions of such plates and panels so that the floor surface does not remain flat. Consequently, corners or edges of the panels project locally out of the neighbouring floor surface. With one-sided loading of an irregular cover, the difference in level between the cover and the surrounding floor surface is increased still further. These edges are an ever-present source of possible accident. This kind of cover, furthermore, is relatively heavy and is difficult and clumsy to handle when opening up and closing the ducts. (b) Frequently, the cover takes the form of individual panels of wood or balks of wood. However, because of moisture differences, the wood can expand or contract. This gives rise to undesirably wide gaps between the panels so that a person's foot or a vehicle wheel can slip between them. Moreover, wood panels or balks have a relatively short-term load-bearing capability, a defect is generally detected and made good only when one breaks (i.e. after a minor or more serious accident). (c) Flagstones or concrete slabs are also used to form the cover. In this case, the requisite load-bearing capability has to be achieved by the use of a large thickness of material; moreover, flagstones and concrete slabs of this kind are cumbersome, liable to be damaged by impact, and uneconomical.

Gratings are not suitable for covering cable and pipe ducts because they do not satisfy the general requirement for closing off the duct; instead, they let in water and air, being therefore suitable only for applications where this is acceptable or necessitated.

The object of this invention is to provide an improved cover for the purpose described which will close off a duct and present a flat upper surface of adequate load-bearing capability.

According to the invention a cover for channels and ducts is made up of individual rigid strips flexibly connected together in close side by side abutting or overlapping relation so as to present a flat upwardly surface.

Preferably the individual strips are flexibly connected together by wire cables so as to form a unit which can be rolled up and unrolled as required.

Preferably also the strips are arranged to extend transversely of the channel or duct and the wire cables to extend in the lengthwise direction of the channel or duct.

Conveniently, each strip when the cover is in use presents a depending flange and the depending flanges have slots which open in the downward direction, the wire cables being press fitted in said slots.

According to a further preferred feature of the invention, the strips of the cover when in use support one another in load-bearing fashion.

In the preferred construction of the cover according to this invention, each strip of the cover in use presents a horizontal flange and a depending flange and a free edge portion, the horizontal flange bearing on or against the back of the depending flange.

Each horizontal flange may be rabbeted along its edge joining with the depending flange, and the free edge portion of the horizontal flange of the neighbouring strip rests on the rabbet so as to bear on the depending flange.

Alternatively, each depending flange presents supporting formations for the free edge portion of the horizontal flange of the neighbouring strip which bears against the back of the depending flange. The strips may each consist of bars of hollow profile, and the hollow profiles of the bars may open in a downward direction.

Whereas the covers for channels and ducts hitherto known and used, to a greater or lesser extent constitute a kind of emergency solution, the invention provides a cover which satisfies all the requirements which could be made of it, in a virtually ideal fashion. The cover in accordance with the invention closes off the channel or duct and forms a plate-like covering with a flat surface defined by the horizontal faces of the strips. This can, if required, be given an anti-flip facing without incurring any substantial extra outlay by corrugating it or the like. Openings can readily be formed in it at precisely desired positions and of precisely desired size. Because the strips are flexibly attached to one another, no gaps can develop between them. If an abnormal load should distort a strip, its neighbours will nevertheless retain their original position and shape. A distorted strip can rapidly and quickly by straightened be hammering it. If individual strips are damaged, they can, if required, be exchanged on the spot without having to dismantle the whole cover unit. If the frame members of the duct or channel are not flat, the strips in each case adapt to the particular surface profile and its locating angles, because the cover is flexible. Thus the cover does not stand above the neighbouring floor surface at any point.

A cover in accordance with the invention, finally, is easy to handle when opening or closing a shaft or the like, because it is necessary only to roll it up or unroll it.

Specific embodiments of the present invention will now be described by way of example with reference to the accompanying drawings in which:-

FIG. 1 is a perspective view of part of a cover in accordance with the invention;

FIG. 2 is a fragmentary view in perspective of a detail of FIG. 1;

FIG. 3 illustrates in perspective a further detail of a slightly modified embodiment; and

FIG. 4 illustrates an embodiment which has been modified still further.

Referring to FIGS. 1 and 2 of the accompanying drawings, first of all, the cover consists of individual rigid strips 1, as shown on the lefthand side of FIG. 1, which define a flat, closed surface in the laid condition. The individual strips 1 consist of profiled bars or angle

irons forming an inverted L, with a horizontal leg or flange 2 and a depending vertical leg or flange 3. Strips 1 are secured relatively to one another in a flexible fashion by braided wire cables 4 or the like, in units of finite length which can be rolled up or unrolled. To attach the strips 1 to the wire cables 4, the vertical flanges 3 of the strips are conveniently provided with slots 5 open in the downward direction, into which the braided wire cable 4 or similar connecting element, which may possibly be coated with synthetic material, is pressed. In this fashion, the strips 1 are flexibly attached in relation to one another and form a unit of finite length which can be rolled up and unrolled. The connection of the strips 1 to the wire cables 4 or similar flexible connecting means, can be achieved in some other suitable manner; however, the mode of attachment described makes it possible to exchange individual strips without disturbing the assembly.

The strips 1 are arranged to extend transversely of the duct or channel D to be covered whilst the cables 4 or the like are arranged to extend in the lengthwise direction of the channel or duct. The opening up and covering of a duct or channel can thus be effected simply by rolling up and unrolling the cover. In the laid condition, the strips 1 rest with their depending flanges 3 on ledges 6 provided in the upper region of the side wall of the duct 7 and shown in broken line in FIG. 1 so that the horizontal flanges 2 of the strips form that surface of the cover which is located in the plane 7 of the floor.

Whereas when rolling up the strips 1, their horizontal flanges 2 slide over one another, as shown at the right-hand side of FIG. 1, in the laid condition they abut one another in load-bearing fashion so that they are capable of withstanding high loadings. The load-bearing relation of the strips 1, one against the other, in the laid condition, is achieved by the fact that the horizontal flange 2 of each strip bears on or against the back of the neighbouring strip. To this end, as FIG. 2 shows, abutment formations 8 can be provided on the vertical flange 3 forming the back of each strip 1, these abutments taking the form of pressed-out loops. The abutment formations 8 are in this context located at the level corresponding approximately to the thickness of the horizontal flange 2, beneath the floor surface formed by the latter, so that in association with the corresponding spacing between the individual strips, the horizontal flanges 2 of each strip abut directly against one another and form a flat, supporting surface which closes off the duct D.

The load-bearing abutment of the strips one against the other, can also be achieved by arranging them in the manner shown in FIG. 3. In such embodiment the horizontal flange 2 of each strip in the back zone thereof forms with the flange 3 a rabbet 9 approximately corresponding in depth to the thickness of the horizontal flange 2 upon which formation a front edge portion of the horizontal flange 2 of the neighbouring strip, then rests over its full length.

From the economic point of view, the covers described with reference to the accompanying drawings, which have the same load-bearing capability and use the same material as rigid cover plates, makes it possible even in the most unfavourable case to achieve a saving in material and in weight of about 50 percent. The reason for this is that the depending flanges of the strips give a better load-bearing capability, whilst the horizontal flanges transmit the load over a relatively short span to the depending flange of the neighbouring strip. A cover as described with reference to the accompanying drawings is also economical to manufacture because even where different widths and loadings are concerned, the system is the same throughout so that mass-production thereof is relatively cheap.

Although the invention is illustrated and described with reference to a plurality of embodiments thereof, it is to be expressly understood that it is in no way limited to the disclosure of such a plurality of embodiments, but is capable of numerous modifications within the scope of the appended claims.

I claim:

1. A collapsible cover assembly for covering channels, ditches and the like, the cover comprising a plurality of rigid individual strips which, jointly form a substantially plane closed supporting surface when said cover assembly is in an operative non-collapsible state, and connecting means flexibly joining said individual strips to each other, said assembly is collapsed by being rolled into a roll, said individual strips being substantially parallel to the axis of said roll, said connecting means including at least one wire which is connected to said individual strips and extends transversely thereto, said individual strips have the shapes of inverted angle irons when said cover assembly is in an operative state, each of said inverted angle iron-shaped individual strips having a horizontal leg forming said supporting surface and a vertical leg forming a back, the free edge of the horizonal leg of each individual strip bearing against the back of the adjacent individual strip.

2. The cover assembly as set forth in claim 1, wherein said individual angle irons are supported by the horizontal leg of the adjacent individual angle iron when said cover assembly is in an operative non-collapsed state.

3. The cover assembly as set forth in claim 2, wherein each vertical leg of said individual strips has at least one projection extending therefrom at a distance from said supporting surface corresponding substantially to the thickness of a horizontal leg of said individual strips.

4. The cover assembly as set forth in claim 2, wherein each one of said individual strips has along the edge formed by the juncture of the horizontal and vertical legs a recess extending from said supporting surface and having depth corresponding to the thickness of said horizontal leg.

5. The cover assembly as set forth in claim 2, wherein said individual strips have downwardly open slits when said cover assembly is in an operative noncollapsed state, said wire being disposed in said slits.

6. The cover assembly as set forth in claim 5, wherein said wire has a plastic coating and is pressed into said slits.

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