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Electrical Wiring Distribution System

This invention relates to an electrical wiring distribution system including metal cellular flooring units adapted to be embedded in concrete and which present alternating troughs and enclosed cells, and more particularly to an improved metal cellular floor unit adapted to convey three different electrical services, such as, power, telephone and computer services.

Heretofore, distribution systems have distributed the wiring of two different services, that is power and telephone. The ever-increasing use of computers and other terminal-to-terminal communications equipment necessitates the distribution of three different services, that is power, telephone and a computer or the like services.

Flooring units for distributing the wiring of three different services throughout a building floor are known. Such a flooring unit is disclosed in U.S. Patent 3,459,375 (FORK) wherein three separate cells of the flooring units each convey a different electrical service. Different arrangements of conduit means connecting adjacent cells and outlet openings provide access to all

three electrical services at a single location in the flooring unit.

Another type of flooring unit is disclosed in U.S. Patent Nos. 3,592,956 (FORK) and 4,178,469 (FORK) wherein

5 capping means encloses the trough space between adjacent cells to provide an additional unobstructed electrical passageway. An arrangement of access openings and partitions provides access to each of the three services at a single location in the floor. Such metal cellular

10 units provide unique solutions for the three-service distribution in reinforced concrete floor structures. However, these metal cellular units find little use in metal sub-floor/concrete floor structures for two principal reasons. A number of the troughs cannot be used

15 for the placing of shear studs and so there is corresponding reduction in the composite beam strength of the floor. In addition, the capped troughs are kept free of concrete by the capping means. Therefore the amount of concrete which would normally be available to serve as a heat sink

20 during a fire is significantly reduced and the fire resistance of the floor structure is likewise reduced.

Another such flooring unit is disclosed in U.S. Patent 3,751,576 (KLINKMAN et al) wherein a relatively wide single cell unit is divided into three separate subcells by

partitions integrally formed in the bottom sheet of the unit. A single relatively wide access opening in the crest of the unit provides access to each subcell and to the wiring conveyed therethrough. Such a unit, commonly
5 known as a plural-cell duct, is used in reinforced concrete floor structures wherein the unit is not intended to serve as a structural component of the floor structure.

An object of this invention is to provide an
10 improved three-service metal cellular flooring unit adapted to distribute three different services along the length thereof, and to offer access to all three services at each of a plurality of spaced locations therealong.

15 According to the invention there is provided electrical wiring distribution apparatus having a corrugated upper metal sheet and a lower metal sheet secured to said upper metal sheet to provide at least two generally parallel cells spaced by a trough,
20 a set of access openings in adjacent cells including a crest access opening in a first cell, and opposed first and second web access openings in sides of said

first cell and a second cell, respectively, a partitioning element along said first cell, dividing said first cell into a first sub-cell including said crest access opening and a second sub-cell including the first web access opening.

A three service metal cellular flooring unit can then be provided wherein the wire-conveying conduits are formed without obstructing the lengthwise troughs thereby retaining the full composite beam and composite slab capacity of the metal cellular flooring unit.

A three-cell metal cellular flooring unit which incorporates at least one partitioning element can have opposite ends configured to prevent hang-up of wiring being fished through the cells of one flooring unit into the cells of the next in-line flooring unit.

Embodiments of the present invention provides improvements in a metal cellular flooring unit of the type presenting at least two generally parallel cells separated by a lengthwise trough. At least one

set of access openings is provided in adjacent cells including a crest access opening in the crest of a first cell, a first web access opening in that web of the first cell presented in the trough, and a
5 second web access opening provided in that web of a second cell presented in the trough. A distinct partitioning element is disposed within the first cell and is substantially coextensive in length therewith. The partitioning element divides
10 the first cell into a first sub cell including the crest access opening and a second subcell including the first web access opening. The overall arrangement is such that computer wiring, power wiring, and telephone wiring may be conveyed
15 separately through the first and second subcells and the second cell, respectively and are thereby maintained segregated one from the other. Access to all three services may be gained at each location in the flooring unit at which a set of
20 the access openings is provided.

When two of the present flooring units are erected end-to-end and cell-to-cell alignment, the

end edges of the two partitioning elements may, for one reason or another, be offset from each other. The leading end of a wire being fished through one of the subcells could hang-up on the adjacent offset end edge. The present invention provides means for eliminating the potential hang-up. That is, a set of generally vertical rib-like protrusions is provided adjacent to each end edge of the partitioning elements. The protrusions are positioned to deflect the leading end of the wire being fished, away from the adjacent offset end edge.

The invention will now be described by way of example with reference to the accompanying drawings, in which

Figure 1 is a fragmentary isometric view illustrating one embodiment of a three-service metal cellular flooring unit according to the invention;

Figure 2 is a broken isometric view of a partitioning element employed in the flooring unit of Figure 1;

Figures 3, 4 and 5 are schematic end views of metal cellular decking illustrating alternative arrangements of the partitioning element;

Figure 6 is a fragmentary broken plan view illustrating two of the flooring units of Figure 1 spanning across horizontal beams and erected in end-to-end and cell-to-cell alignment;

5 Figure 7 is a fragmentary plan view of the flooring unit of Figure 5;

Figure 8 is a fragmentary broken cross-sectional view taken along the line 8-8 of Figure 2;

Figure 9 is a fragmentary cross-sectional view,
10 similar to Figure 8, illustrating a region of the end joint between the flooring units of Figure 6;

Figure 10 is a cross-sectional view taken along the line 10-10 of Figure 6;

Figure 11 is a fragmentary plan view of closure
15 means illustrated in Figure 10;

Figure 12 is a fragmentary plan view similar to Figure 11 with closure plates removed to show details;

Figure 13 is a plan view of a central closure plate;

Figure 14 is an end view, partly in cross-section,
20 as seen from the line 14-14 of Figure 13;

Figures 15 and 16 are cross-sectional views taken along the lines 15-15 and 16-16 respectively of Figure 13;

Figure 17 is a plan view of a lateral closure plate;
Figure 18 is a cross-sectional view taken along the
line 18-18 of Figure 17;

5 Figure 19 is a fragmentary plan view of cover
retention means;

Figure 20 is a cross-sectional view taken along the
line 20-20 of Figure 11;

Figure 21 is a cross-sectional view, similar to
Figure 10. illustrating an alternative arrangement;

10 Figure 22 is a fragmentary plan view of closure
means illustrated in Figure 21;

Figure 23 is a fragmentary plan view, similar to
Figure 11, wherein closure plates are removed to show
details;

15 Figure 24 is a plan view of a central closure plate;

Figure 25 and 26 are cross-sectional views taken
along the lines 25-25 and 26-26, respectively, of
Figure 24;

20 Figure 27 is a plan view of a lateral closure
plate;

Figure 28 is a side view of the lateral closure
plate of Figure 27; and

Figure 29 is a cross-sectional view taken along the
line 28-29 of Figure 27.

Referring to the drawings, Figure 1 illustrates a three-service metal cellular flooring unit 20 comprising a corrugated upper metal sheet 22 presenting alternating coplanar crests 24 and coplanar valleys 26 and webs 28 interconnecting adjacent crests 24 and valleys 26. A correlative lower metal sheet 30 is secured to the upper metal sheet 22 along contiguous portions thereof. The flooring unit has stiffened edges 32, 34 along its opposite longitudinal edges adapting the flooring unit 20 erection in side-by-side overlapped relation with adjacent ones of the flooring units 20 or of single-thickness corrugated decking units. The flooring unit 20 as well as others hereinafter described may comprise those metal cellular flooring units disclosed in U.S. Patent No. 3,812,636 issue May 28, 1974 and assigned to the assignee of the present invention.

The lower metal sheet 30 cooperates with the corrugated upper metal sheet 22 to provide generally parallel cells 36, 38 which are separated by a lengthwise trough 40. It will be observed in Figure 1 that the trough 40 comprises one of the valleys 26 and confronting webs 28 which interconnect the valley 26 to the adjacent coplanar crests 24.

A set 42 of access openings including a crest access opening 44 is provided in the crest 24 of the first cell 36. Opposed first and second web access openings 46, 48 are provided in the confronting webs 28 of the first and second cell 36 and 38 respectively.

The first cell 36 has an internal partitioning element 50 which is substantially coextensive in length therewith. The partitioning element 50 divides the first cell 36 into a first subcell 52 which includes the crest access opening 44 and a second subcell 54 which includes the first web access opening 46. Thus, the flooring unit 20 is adapted to distribute the wiring of three different services. For example, computer wiring 56 may be distributed through the first subcell 52 and is accessible through the crest access opening 4. Power wiring 58 may be distributed through the second subcell 54 and is accessible through the first web access opening 46. Telephone wiring 60 may be distributed through the second cell 38 and is accessible through the second web access opening 48.

The partitioning element 50 (Figure 2) preferably comprises a profiled metal sheet having a top flange 62, a central portion 64 depending from the top flange 62, and a bottom flange 66 extending laterally away from

the central portion 64 in a direction opposite to that of the top flange 62. As best shown in Figure 1, the top flange 62 is disposed adjacent to the crest 24 of the first cell 36 and resides between the crest access opening 44 and the lengthwise trough 40. The central portion 64 extends downwardly from the top flange 62 toward the lower metal sheet 30. The bottom flange 66 (Figure 2) extends between a valley 26 and the lower metal sheet 30. In the preferred arrangement, securing means, such as spot welds 68, secure the bottom flange 66 to the valley 26 and the lower metal sheet 30.

The central portion 64 has sets 70 of rib-like protrusions one protrusion being adjacent to each of opposite end edges 72, 73 of the partitioning element 50. As will be described, the protrusions 70 serve to deflect wires being fished through the cell of one flooring unit into the corresponding cell of the next adjacent flooring unit and thereby prevent the wires from hanging-up or snagging on the end edge of the partitioning element of the next adjacent flooring unit.

Figure 1 illustrates the metal cellular flooring unit 20 having two adjacent cells 36, 38. The set 42 of access openings and the partitioning element 50 are equally useful in flooring units having more than two cells. For example, Figure 3 illustrates a flooring

unit 74 presenting a central or second cell 38, and two lateral or first cells 36, 36' one on each side of the central or second cell 38. One of the first cells 36 is subdivided by the distinct partitioning element 50.

5 Figure 4 illustrates a flooring unit 76 having a central or first cell 36 provided with the distinct partitioning element 50, and lateral or second cells 38, one on each side of the central or first cell 36. Figure 5

illustrates a flooring unit 78 having a central or
10 second cell 38, and lateral or first cells 36, one on each side of the central or second cell 38, the lateral cells 36, 36' are each subdivided by a distinct partitioning element 50 to provide first and third subcells 52, 52' and second and fourth subcells 54, 54'.

15 Figure 6 illustrates a portion of a floor structure 79 wherein two of the flooring units 20A, 20B span across horizontal beams 80 of the structural framework. The flooring units 20A, 20B are erected in end-to-end relation, that is with the ends 82A, 82B thereof adjacent
20 to each other to form an end joint 83; and in cell-to-cell registration. Each of the flooring units 20A, 20B has a plurality of the sets 42 of access openings preferably provided at uniformly spaced locations along the length

thereof. The arrangement provides individual locations at which access to the three services may be gained, for example, through outlet means 84 and the associated passageways (not visible) extending through the overlying layer of concrete 86.

Figure 7 illustrates a fragmentary plan view of the three-cell flooring unit 78. The flooring unit 78 has first sets 42A of the access openings at uniformly spaced locations along the first and second cells 36, 38. The flooring unit 78 also is provided with second sets 42B (only one set illustrated) of the access openings at uniformly spaced locations along the first and second cells 36', 38. The second set 42B includes a second crest access opening 44', a third web access opening 46' and a fourth web access opening 48' providing access, respectively, to the third and fourth subcells 52', 54' and the second cell 38. Each second set 42B of access openings is offset from the first sets 42A longitudinally along the flooring unit 78 and resides centrally between adjacent ones of the sets 42A. The flooring unit 78 is capable of providing the same density of outlet 84 (Figure 6) as the flooring unit 20 but at staggered locations in the floor structure.

Referring to Figure 8, each set 70 of rib-like protrusions preferably comprises corrugations 88 formed integrally in the central portion 64 immediately adjacent the opposite end edges 72, 73 of the central portion 64.

5 In addition, the corrugations 88 extend outwardly from both of the opposite faces of the central portion 64.

Figure 9 illustrates a fragment of the joint 83 formed between the flooring units 20A, 20B of Figure 6. During the manufacture of the flooring units 20, the

10 partitioning element 50 may, for one reason or another, be offset from the desired location. As can be seen in Figure 9, the partitioning element 50A is not aligned with the partitioning element 50B. Therefore the end edges 72A, 73B thereof are misaligned. When wiring, such as

15 the computer wiring 56 is fished through the first subcell 52A the leading end 90 thereof may, in the absence of the corrugations 88, engage or hang-up on the end edge 73B of the partition element 50B of the next adjacent flooring unit 20B. However, as illustrated in Figure 9,

20 the wiring end 90 engages the corrugation 88 and is deflected thereby away from the end edge 73B. Therefore wiring may be fished in either direction in the first and second subcells 52, 54, respectively, without fear of the wiring hanging-up or snagging on a projecting end

of either of the partitioning elements 50.

Referring to Figure 10, a housing 92 is provided in overlying relation with the flooring unit 20B and provides a chamber designated generally by the numeral 94 which
5 encloses the crest access opening 44 and a portion of the lengthwise trough 40 which includes the first and second web access openings 46, 48. The housing 94 includes an inverted cup-shaped housing 96 having an upper wall
93 provided with a single outlet opening 100, and
10 trough closure 102 (only one visible in Figure 10) depending into the lengthwise trough 40. An inverted generally U-shape member 104 extending transversely of the housing 96 and the trough closures 102, includes a top wall 106 at least at the level of the upper wall
15 93 of the housing 96, and opposite sidewalls 108 depending from opposite sides of the top wall 106 toward the flooring unit 20B. The U-shape member 104 divides the chamber 96 into a first compartment 110 including the crest access opening 44, a second compartment 112
20 including the second web access opening 48, and a central compartment 114 including the first web access opening 46.

Referring to Figures 10 and 12, the top wall 106 is adapted to support an electrical duplex receptacle 116
25 at a level adjacent to the upper surface 118 of the floor structure 79. A second of the duplex receptacles 116 may

be supported on the inner sidewall 103 as shown in Figure 10.

Figures 10 to 12 illustrate the housing 92 in an activated state, that is, after the concrete above the housing 92 has been removed to provide a concrete passageway 119 and the outlet 34 has been installed. The outlet 34 includes a finishing ring 120 secured to the housing 92, and closure means 122 fitted within and secured to the finishing ring 120. The closure means 122 may comprise a three-piece unit including a central closure plate 124 and lateral closure plates 126, 128. The central closure plate 124 is retained in position relative to the finishing ring 120 by a single fastener 130 (Figure 11) threaded into the receptacle 116. Covers 132 (Figure 11) are individually pivotally and removably connected to the central closure plate 124. When closed, the covers 132 protect the receptacle 116 from ingress of fluids and inadvertent entry of short-producing debris. Each cover 132 may be opened or removed entirely when necessary, to provide access to the subjacent plug.

The central closure plate 124 (Figures 13 to 16) has a generally rectangular shape including a central opening 134 surrounded by a perimeter bead 136 having a bead upper surface 138. Lateral first shoulders 140, one adjacent to each of the opposite sides 142, provide support for

the covers 132 (Figure 11). Discontinuous second shoulders 144 disposed below the level of the first shoulders 140 provide support for a face plate 146, a fragment of which is illustrated in Figure 13. The face plate 146 (Figures 11 and 13) has openings 148 which provide access to the outlets of the receptacle 116 and a single central aperture 150 for receiving the fastener 130 (Figure 11). The fastener 130 secures the face plate 146 to the electrical receptacle 116 thereby retaining the central closure plate 124 in fixed position relative to the finishing ring 120 (Figure 12).

Reverting to Figures 14 to 16, a perimeter recess 152 is provided below the bead 136, which extends along the opposite sides 142 and along the opposite ends 154.

Referring to Figures 17 and 18, the lateral closure plates 126 (128) are identical in configuration. Each of the plates 126 (128) includes opposite sides 156, 157 and opposite ends 158. A flange 160 extends outwardly from the side 156. As shown in Figure 20, the central and lateral closure plates 124, 126 have confronting sides 142 and 156. The flange 160 of the lateral closure plate 126 (128) is engaged in the recess 152 of the closure plate 124 thereby precluding upward movement of the lateral closure plate 126 (128) relative to the central closure plate 124.

Referring to Figures 10 and 11, each of the lateral closure plates 126, 128 is provided with a releasable fastener 161 operable from the upper surface 162 of each plate, for releasably securing each closure plate 126, 128 to the finishing ring 120 (Figure 12). Reverting to Figures 17 and 18 each of the lateral closure plates 126 (128) is provided with a clearance aperture 164 adjacent the side 157. A recessed area 166 provided in the upper surface 166 surrounds the aperture 164. Referring to Figures 19 and 20, the releasable fastener 161 comprises a slotted head 168 disposed within the recessed area 166 and substantially flush with the upper surface 162. A stem 170 depends from the slotted head 168 downwardly through the clearance opening 164. A clip 172 carried by and rotatable with the stem 170, includes a wing 174 positioned to be resiliently engaged beneath a flange segment 176. As can be seen in Figure 12, the finishing ring 120 has opposed support flanges 176, one at each of its opposite ends. Referring to Figure 19, the slotted head 168 may be rotated by any suitable tool so that the wing 174 shown in dash-dot outline is rotated out from under the support flange 176, thereby releasing the lateral closure plate 126 or 128 for removal. The lateral closure plate 126 (128) is provided with posts 178, 179 which project downwardly from the lower face 177 (Figure 18)

thereof. The posts 178, 179 are positioned to limit rotation of the clip 172 to the extreme positions illustrated in Figure 19.

As is conventional, each of the lateral closures 126 (128) is provided with a plurality of weakened areas 180 along the perimeter thereof, which may be cut away to allow egress of wiring from the subjacent compartments 110, 112 (Figure 10).

The closure means 84 (Figure 10) is useful in those installations wherein it is desired to have the electrical receptacle 116 substantially flush with the upper surface as carpeting 182. The closure means 84 also allows rapid access to each of the compartments 110, 112 by removal of the appropriate lateral closure plate 126 or 128.

An alternative outlet arrangement is illustrated in Figures 21 to 29, inclusive. Corresponding numerals will be employed to identify corresponding parts heretofore described.

Figure 21 illustrates a floor structure 186 incorporating the flooring unit 20 and cooperating therewith, the housing 92 and the inverted U-shape member 104 providing the first, second and central compartments 110, 112, 114. In this arrangement, the sidewall 108 of the member 104 supports two receptacles 116 which, as best shown in Figure 23, are housed within and accessible from the second

compartment 112. An outlet 184, supported within the concrete passageway 119 substantially flush with the upper surface 118 of the concrete 86, provides ready access to the first and second compartments 110, 112.

5 The outlet 184 includes a three-piece closure member 190 supported on the finishing ring 120.

The finishing ring 120 (Figure 23) has a generally rectangular configuration including opposite sides 192, opposite ends 194, opposed first support flanges 196
10 on opposed interior edges and centrally of the sides 192, and opposed second support flanges 176 on opposed interior edges and centrally of the ends 194.

The closure member 190 (Figures 21 and 22) includes a central closure plate 200, one of the heretofore
15 described lateral closure plates 126 as a first lateral closure plate 126, and a second lateral closure plate 202. Each of the closure plates 126, 202 is provided with one of the heretofore described releasable fasteners 161. As best seen in Figure 22, the central closure plate
20 200 spans across the opposite sides 192 of the finishing ring 120 and is secured to the first support flanges 196 by positive fasteners 203 (only one visible). The first lateral closure plate 126 has opposite first and second plate sides 204, 206. The first lateral closure plate 126
25 is installed so that the first plate side 204 thereof

underlaps the central closure 200 and so that the second plate side 206 overlies one of the second support flanges 176 and is secured thereto by the releasable fastener 161. The second closure plate 202 has opposite first and second plate sides 208, 210. The second lateral closure plate 202 is arranged so that the first plate side 208 thereof overlaps central closure plate 200 and so that the second plate side 210 overlies the other second support flange 176 and is secured thereto by the releasable fastener 161. The first plate side 208 of the second lateral closure plate 202 is pivotally connected by pivot means 212 (not visible in Figure 22) to the central closure plate for pivotal movement about an axis 214 extending transversely of the opposite sides 192 of the finishing ring 120. The arrangement is such that when the releasable fastener 161 is released, the second lateral closure plate 202 may be lifted in lidlike fashion to gain access to the subjacent compartment 112.

Referring to Figures 24 to 26, the central closure plate 200 comprises a generally channel-shape upper portion 216 having an upper face 217. The upper portion 216 includes opposite end portions 218, 220 and a connecting portion 222. The end portions 218, 220 and the connecting portion 222 have contiguous interior faces 217, 219, 223,

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respectively. The central closure plate 200 additionally includes a ledge 224 which is contiguous with the upper portion 222 and has ledge extensions 226, 228 which are contiguous with the end portions 218, 220. The ledge 224 and ledge extensions 226, 228 have a common upper surface 230 which is below the level of the upper face 217 of the upper portion 222. A pocket 232 is formed by the ledge 224 and the contiguous interior faces 219, 221, 223 of the upper portion 222. Fastener receiving apertures 234 are provided, one in each of the ledge extensions 226, 228. As best seen in Figure 25 and 26, a recess 236 is provided along that edge of the connecting portion 222 opposite the ledge 224.

As heretofore indicated, the first lateral closure plate is identical to the lateral closure plate 126 described above in connection with Figures 17 and 18.

Referring to Figures 27 to 29, the second lateral closure plate 202 has a main body portion 238 and a tongue 240 having a common upper face 242. The tongue 240 has opposite end faces 244 and pins 246, one projecting from each of the end faces 244 and being axially aligned along the pivot axis 214. The pins 246 are received in grooves 248, 250 (Figures 24 to 26) in the interior faces 219, 221 of the end portions 218, 220. The groove 248 is provided with an exit slot 252 which permits the associated pin 246 to be removed from

the groove 248 thereby allowing the second closure plate 202 to be removed.

5 It will be observed in Figure 22 that the first, second and central closure plates 126, 202, 200, when assembled, present a generally rectangular configuration. Either of the first and second lateral closure plates 126, 202 may be removed by releasing the releasable fastener 161 thereby gaining rapid access to the subjacent compartments 110, 112 (Figure 21).

10 It should be readily apparent from the foregoing description that the present invention provides an improved three-service wire distribution unit adapted to distribute three different electrical services along the length thereof, and to offer convenient access by
15 means of improved outlet means, to all three services at each of a plurality of spaced locations therealong.

CLAIMS

1. Electrical wiring distribution apparatus having a corrugated upper metal sheet and a lower metal sheet secured to said upper metal sheet to provide at least
5 two generally parallel cells spaced by a trough, a set of access openings in adjacent cells including a crest access opening in a first cell, and opposed first and second web access openings in sides of said first cell and a second cell, respectively, a
10 partitioning element along said first cell, dividing said first cell into a first sub-cell including said crest access opening and a second subcell including the first web access opening.
2. Apparatus as claimed in claim 1, wherein
15 said partitioning element comprises a profiled metal sheet having a top flange for engagement with a crest of said first cell between said crest access opening and said trough, a central portion extending from said top flange downwardly towards said lower
20 metal sheet, and a bottom flange which extends laterally away from said central portion in a direction opposite to that of said top flange, for securement to said lower metal sheet.



3. Apparatus as claimed in claim 1 or 2, wherein said bottom flange extends substantially interjacent a floor portion of said trough and said lower metal sheet, and is secured thereto by means of spot welds.
4. Apparatus as claimed in any one of claims 1 to 3, having a central cell and lateral cells, one on each side of said central cell, said adjacent cells comprising a lateral cell and said central cell.
5. Apparatus as claimed in claim 4, wherein said first cell comprises said lateral cell.
6. Apparatus as claimed in claim 4 or 5, having a second set of access openings in other adjacent cells consisting of said central cell and the other lateral cell, including a second crest access opening in said other lateral cell, and opposed third and fourth web access openings in sides of said other lateral cell and said central cell, respectively, and a second partitioning element along said other lateral cell, dividing said other lateral cell into a third subcell including said second crest access opening and a fourth subcell including the third web access opening, said second set of access openings being staggered relative to the first said set of access openings in a



longitudinal direction of said flooring unit.

7. Apparatus as claimed in claim 2, wherein
said central portion has a set of rib-like
protrusions adjacent each end edge of said central
5 portion, at least one of the protrusions of each said
set projecting out of the plane of said central portion,
said rib-like protrusions extending transversely of
said central portion.

8. Apparatus as claimed in claim 7, wherein the
10 protrusions of each said set comprise corrugations.

9. Apparatus as claimed in any one of the
preceding claims, wherein at least two flooring units
are erected in end-to-end relationship and in cell-to-
cell registration with the end edges of the partitioning
15 elements of said flooring units adjacent to one another,
wherein the protrusions of one said portion are, in use,
engageable by a leading end of wiring pushed through
one said subcell so as to deflect said leading end away
from the end edge of the other partitioning element.

20 10. Apparatus as claimed in claim 9 for distributing
the wiring of three electrical services, comprising a
metal subfloor including at least one flooring unit,
a housing overlying said at least one flooring unit
and providing a chamber enclosing said crest access



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opening and a portion of said trough including said first and second web access openings, said housing having an upper wall with an outlet, an inverted generally U-shape member extending transversely of said housing and having a top wall exposed at said outlet at least at the level of said upper wall, opposite sidewalls extending downwardly from said top wall toward said flooring unit, said U-shape member dividing said chamber into a first compartment including said crest access opening, a second compartment including the second web access opening, and a central compartment including the first web access opening, a layer of concrete, which overlies said metal subfloor, having an upper surface with an opening to provide access to said chamber, and outlet means capping said opening and being substantially flush with said upper surface of said concrete.

11. Apparatus as claimed in claim 10, having an electrical receptacle supported by said top wall, wherein said outlet means comprises a finishing ring for supporting a three-piece closure member.

12. Apparatus as claimed in claim 11, wherein a positive fastener is provided for securing a receptacle face plate to said electrical receptacle and for



retaining said closure member in fixed position relative to said finishing ring.

13. Apparatus as claimed in claim 11 or 12, wherein said closure member comprises lateral closure
5 plates separated by a central closure plate and arranged in a side-by-side relationship, said central closure plate having a flange-receiving recess along each opposite side thereof, a generally rectangular central opening surrounded by an upstanding
10 perimeter bead, a receptacle face plate supported within said central opening at a level below an upper surface of said perimeter bead cover means overlying said face plate and being pivotally and removably connected to
15 said central closure plate and substantially flush with said bead upper surface, each of said lateral closure plates having an upper face below the level of said bead upper face, opposite ends substantially flush with the corresponding opposite ends of said central closure plate, a flange extending outwardly
20 from one side thereof and engaged in the adjacent flange-receiving recess of said central closure plate, releasable fastener means remote from said central closure plate and operable from said upper face for releasably securing said lateral closure plate



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to said finishing ring.

14. Apparatus as claimed in claim 11, 12 or 13,
wherein said finishing ring has opposed support flanges,
one extending inwardly beneath each of said lateral
5 closure plates, each of said releasable fastener means
comprising a slotted head flush with the upper surface
of the lateral closure, a stem depending from said
slotted head downwardly through a clearance opening in
the lateral closure plate, and clip means carried by
10 said stem, including a wing resiliently engagable beneath
the adjacent one of said support flanges.

15. Apparatus as claimed in claim 10 or 11, wherein
said outlet means comprises a generally rectangular
finishing ring which is disposed within said opening
15 for supporting a three-piece closure member, said
finishing ring having opposite ends, opposite sides,
opposed first support flanges on opposed interior
edges of said sides, opposed second support flanges on
opposed interior edges of said ends.

20 16. Apparatus as claimed in claim 15, wherein said
closure member comprises an upper surface and a central
closure plate spanning across said opposite sides and
secured to said first support flanges, a first lateral
closure plate having opposite plate sides, a first of



said plate sides underlapping said central closure plate,
and a second of said plate sides overlying one of said
second support flanges, a second lateral closure
plate having opposite plate sides, a first of said
5 plate sides overlapping said central closure plate,
and a second of said plate sides overlying the other
of said second support flanges, pivot means pivotally
connecting said first of said plate sides of said second
lateral closure plate to said central closure plate for
10 pivotal movement about an axis parallel with said first
of said plate sides, and each of said second of said
plate sides including releasable fastener means operable
from said upper face securing each lateral closure
plate to the subjacent second support flanges.

15 17. Apparatus as claimed in claim 15 or 16,
wherein said closure member comprises first and second
lateral closure plates separated by a central closure
plate and arranged in a side-by-side relationship,
said lateral closure plates and said central closure
20 plate having coplanar upper surfaces, said central
closure plate having opposite ends and including a generally
channel-shape upper portion having opposite end portions
and a connecting portion, a ledge contiguous with
said upper portion and having ledge extensions



contiguous with said end portions, said ledge and said ledge extensions having a common upper surface below the level of said coplanar upper faces, a pocket formed by said ledge and contiguous interior faces of said upper portion, a fastener-receiving aperture in each of said ledge extensions, and a recess along that edge of said connecting portion opposite said ledge, said first lateral closure plate having opposite ends coterminating with said opposite ends of said central closure plate, and a flange on one side thereof engaged with said recess, said second lateral closure plate having opposite ends coterminating with said opposite ends of said central closure plate, and a tongue disposed in said pocket, connecting means pivotally connecting said tongue to said central closure plate for pivotal movement about an axis parallel with said connecting portions, and each of said lateral closure plates including releasable fastener means operable from the upper face thereof for securing the lateral closure plate to a subjacent second support flange.

18. Apparatus as claimed in claim 17, wherein said connecting means comprises a pair of spaced co-axial pins disposed on end faces of said tongue, each pin outwardly projecting from each of said end faces of said



tongue into an adjacent one of a pair of spaced coaxial grooves disposed in the interior face of each of said end portions.

- 5 19. Apparatus substantially as herein described with reference to and as illustrated in Figures 1 to 9, with Figures 10 to 20 or with Figures 21 to 29.
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