July 31, 1962 S. G. CLEMENTS ETAL 3,047,111

METAL SHEETING

Filed Nov. 2, 1959 3 Sheets-Sheet 1

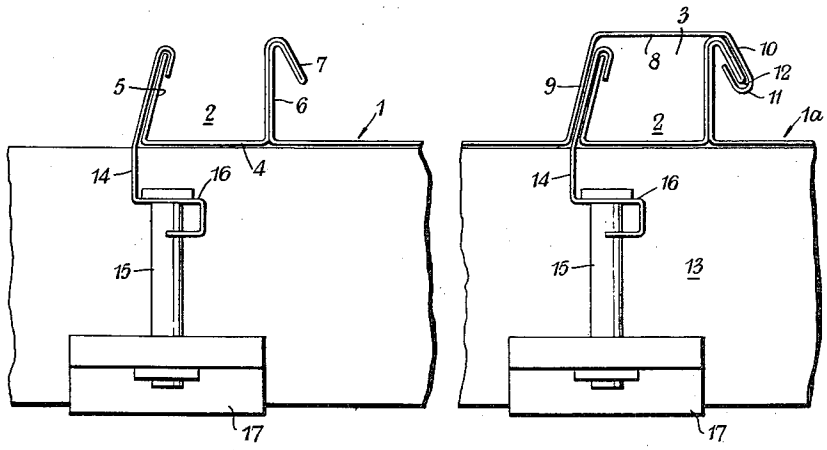


FIG.1

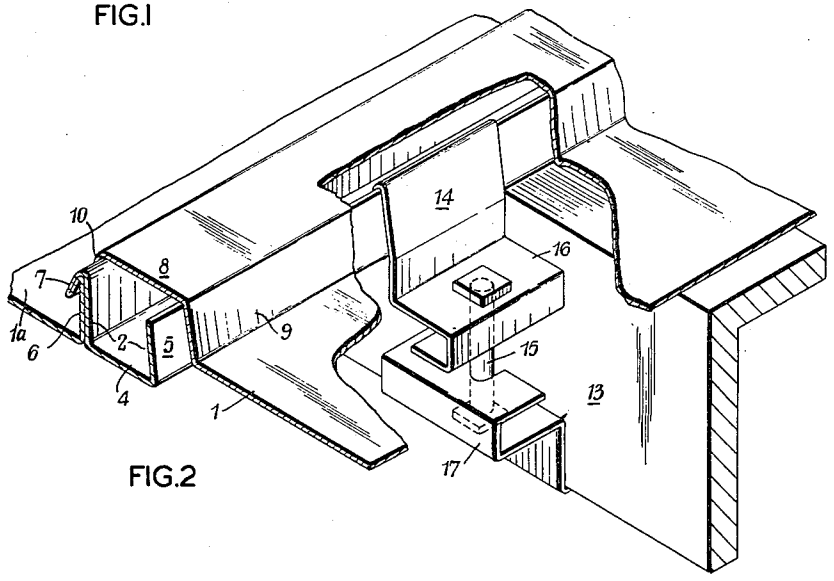


FIG.2

Inventors
Stephen Geoffrey Clements
Eric Hugh Leithwaite
By Peck & Peck
Attorneys

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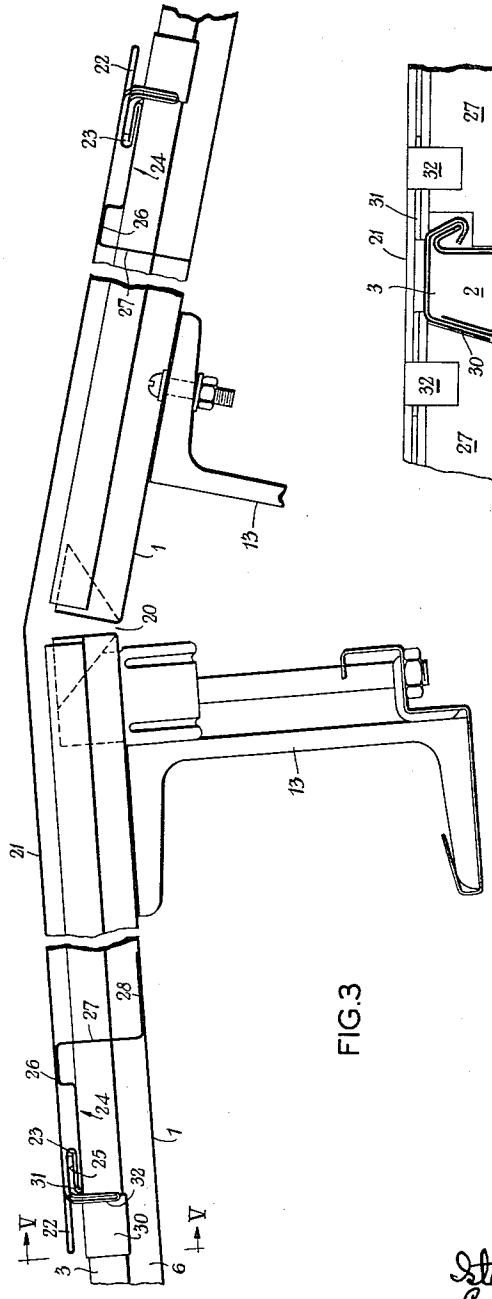


FIG.3

FIG.5

Inventors
Stephen Geoffrey Clements
Eric Hugh Haithwaite
By Peck & Peck
Attorneys

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METAL SHEETING

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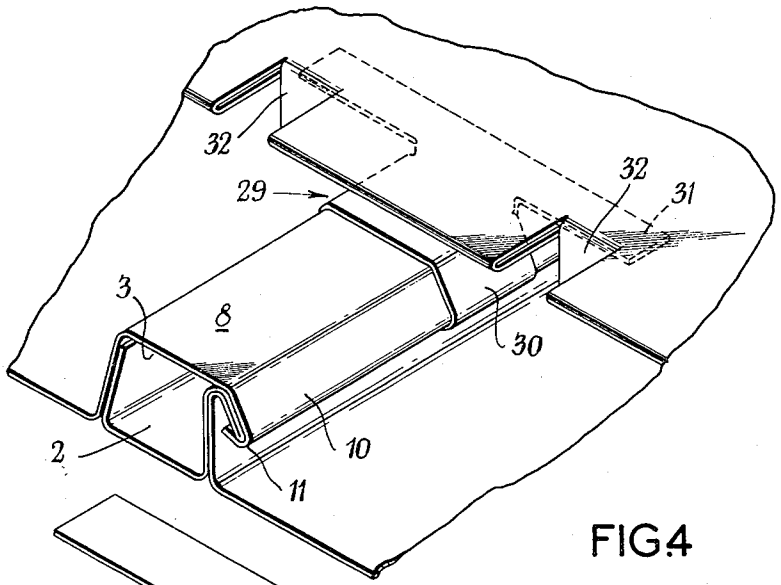


FIG.4

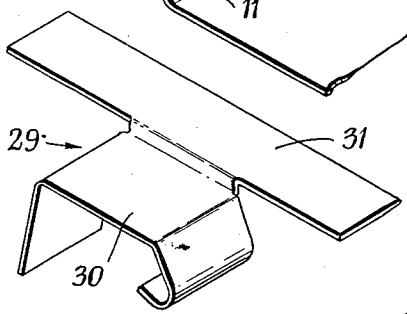


FIG.7

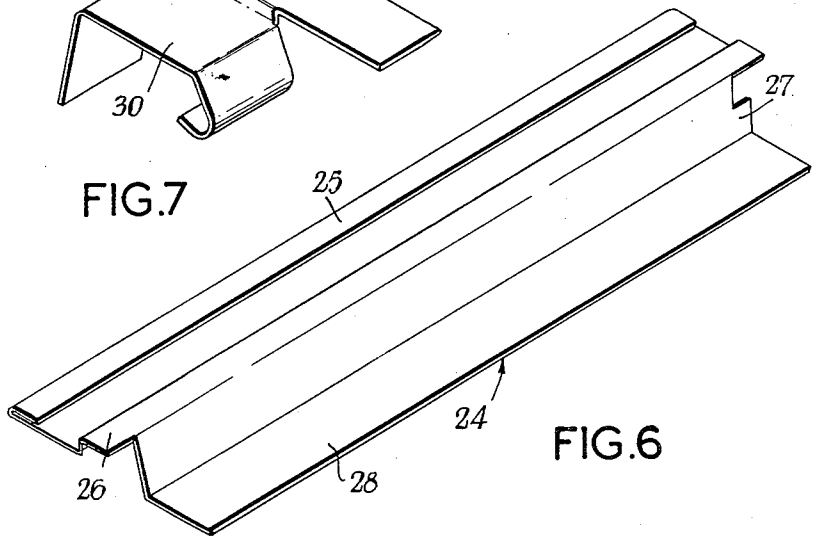


FIG.6

Inventors
Stephen Geoffrey Clements
Eric Hugh Calthwaite
By Peck & Peck
Attorneys

United States Patent Office 3,047,111 Patented July 31, 1962

3,047,111
METAL SHEETING

Stephen Geoffrey Clements, St. Albans, and Eric Hugh Laithwaite, Windsor, England, assignors to The British Aluminium Company Limited, London, England, a company of Great Britain

Filed Nov. 2, 1959, Ser. No. 850,370
Claims priority, application Great Britain Nov. 4, 1958
14 Claims. (Cl. 189—86)

This invention relates to improvements in metal sheeting.

It is an object of the present invention to provide an improved metal sheet which may be readily interlocked with a neighbouring similar metal sheet and which may be fastened to a supporting member without the fastening means being visible from the exposed side of the sheet to provide a metal covering such as, for example, roofing or wall panelling.

According to the present invention a metal sheet is provided with a channel along each of two opposed parallel edges, the two channels opening in opposite direction and being dimensioned so that the walls of one channel are capable of extending into the other channel of a similar sheet, the free edge of the inner wall of the one channel being turned over away from the outer wall thereof and the free edge of the outer wall of the other channel being formed with a hook portion adapted to engage the turned over portion of the one channel of a similar sheet.

The metal sheet is conveniently roll formed from a suitable material, e.g. aluminum or aluminum alloy.

The invention also extends to a metal covering such as, for example, roofing or wall panelling, constructed from a number of similar metal sheets according to either of the two immediately preceding paragraphs.

One embodiment of the invention will now be described by way of example, reference being made to the accompanying drawings in which:

FIGURE 1 is a fragmentary end elevational view illustrating two similar metal sheets according to the invention interlocked with each other and supported on and connected to purlins to form part of a roofing structure,

FIGURE 2 is a fragmentary perspective view of an arrangement similar to that illustrated in FIGURE 1 and showing a slightly modified form of clip connecting the metal sheets to the purlins,

FIGURE 3 is a transverse sectional view of the metal sheets according to the invention applied to a roof structure, the two halves of the Figure showing modifications,

FIGURE 4 is a fragmentary perspective view of the roof structure of FIGURE 3.

FIGURE 5 is a section taken on the line V—V of FIGURE 3.

FIGURE 6 is a perspective view of a ridge filler piece, and

FIGURE 7 is a perspective view of a ridge clip.

The two similar metal sheets of this example are indicated generally at 1 and 1*a* respectively and are roll formed from aluminum or an aluminum alloy. Each sheet is provided along each of two opposed parallel edges with channels 2 and 3 opening in opposite directions. Each channel 2 has its base 4 in the general plane of the sheet in which it is formed and has two upstanding side walls 5 and 6. The inner wall 6 has a marginal portion 7 at its free edge turned over away from the outer wall 5 and inclined downwardly towards the general plane of the sheet. The channel 3 has its base 8 substantially parallel to but spaced from the general plane of the sheet in the direction in which the side walls 5 and 6 extend

and is defined by side walls 9 and 10, the free edge of the outer side wall 10 being formed with a hook portion 11 produced by inwardly turning over a marginal portion of the free edge of the wall 10 upon itself leaving a gap to provide a channel 12 adapted to receive the turned over marginal portion 7 of an adjacent similar sheet. The dimensions of the channels 2 and 3 are such that the wall of a channel 2 may extend into the channel 3 of an adjacent similar sheet.

The outer wall 5 of the channel 2 is inclined inwardly of the channel 2 and the inner wall 6, which is of double thickness, extend substantially normal to the general plane of the sheet. The height of that part of the wall 6 defining the channel 2 is greater than the height of the wall 5. The wall 9 of the channel 3 is inclined in a direction substantially parallel to that of the wall 5, i.e. outwardly of the channel 3, and has a height, measured internally of the channel 3, which is substantially equal to that of the wall 6. The wall 10 is inclined outwardly of the channel 3 so as to extend substantially parallel with the marginal portion 7 and has a height, measured internally of the channel 3, substantially equal to that of the turned over portion 7. The width of the channel 12 is slightly greater than the double thickness of the metal of the sheet in the turned over portion 7. The width of the base 8 of the channel 3 is slightly greater than that of the base 4 of the channel 2.

The ceiling, roof or wall panelling is constructed by supporting the sheeets by the base of the channels 2 on purlins 13 extending transversely of the general direction of length of the channels 2 and securing them thereto by clips 14 which hook over the free edge of the side walls 5 and are secured in a suitable manner to the purlins 13. The sheet 1 is arranged with the walls 5 and 6 of the channel 2 of the sheet 1*a* extending into the channel 3 of the sheet 1 and the turned over marginal portion 7 of the sheet 1*a* received in the channel 12 of the hook portion 11 of the sheet 1. A number of similar sheets are similarly interlocked and secured to the purlins. Each sheet is secured to the purlins along its one edge by the clips 14 and by its opposed edge is fixed by the hook portion 11 to the adjacent sheet so that each sheet is firmly secured and prevented from being lifted up from the purlins. A metal covering formed from a number of similar sheets as described is quite suitable for roofing as it cannot be lifted by high winds from the purlins to which it is attached. Additionally, as will be appreciated from the accompanying drawing, the fixing means, i.e. the clips 14 are concealed from view from the upper side of the covering. A further advantage is that by virtue of the manner in which the hook portion 11 of one sheet receives the turned over portion 7 of another sheet, rain is prevented from being blown in at the joint between two adjacent sheets. However, should any rain or moisture penetrate the joint it will drain safely away along the channel 2.

The clips 14 are shown in FIGURES 1 and 2 as being secured to the purlins 13 by bolts 15 engaging a flange 16 formed on each clip 14 and also engaging a further clip 17 which is drawn up by the associated bolt 15 to engage the underside of the purlin 13. The clips 14 shown in FIG. 1 differ from that shown in FIG. 2 in that in the one case the flanges 16 of the clips 14 extend under the associated sheet 1 whereas in the other case the flanges 16 extend in the opposite directions under the adjacent sheet 1. Many other alternative means for securing the clips 14 to the purlins 13 will be apparent to those skilled in the art. The advantage of the arrangement shown in FIGURE 2 is that the clips 14 and 17 are similar and only one type of clip is required in

producing the metal covering and securing it to the supporting purlin.

It will be appreciated that supporting means other than purlins may be employed, for example, timber, concrete or composite boarding, in which case the clips **14** may be suitably modified and screwed or bolted direct to the supporting means.

In some applications it is necessary to provide a cover flashing for a metal covering formed from a number of similar sheets according to the invention, e.g. on a roof at the ridge, at chimneys and at other end walls. The method of, and means for, securing such a flashing for a roof ridge will now be described with reference to FIGURES 3 to 7. The roof is formed from two metal coverings each composed of a number of similar sheets **1** secured and interlocked as described above, the two metal coverings meeting at the ridge of the roof but leaving a gap **20** which is covered by a metal flashing **21**. The opposed longitudinal edges of the flashing **21** extending parallel with the roof ridge are folded under and inwardly to provide a channel **22** and are then folded under and outwardly to provide a further channel **23**. The channels **22** are intended to receive and locate metal sheeting (not shown) which underlies the joints in adjacent pieces of flashing, the joint lines extending normal to the direction of the roof ridge. A ridge filler piece indicated at **24** is folded along one longitudinal edge to provide a tongue **25** intended to be accommodated in the channel **23** and has a raised supporting surface **26** intended to support the flashing between adjacent channels **2** and **3** in the metal sheets **1**. The ridge filler piece **24** is further provided with a side flange **27** extending downwardly from the surface **26** and intended substantially to close the gap between the flashing **21** and the metal sheets **1** and having its side edges shaped accordingly. The lower longitudinal edge of the side flange **27** rests on the metal sheets **1** as can be seen at the right-hand side of FIG. 3 and it may have a further flange **28** connected thereto (as can be seen at the left-hand side of FIG. 3) which flange **28** rests on the metal sheet **1**.

A ridge clip indicated generally at **29** (FIG. 7) is provided having a portion **30** of substantially the same, but slightly larger, cross-section as a channel **3** so as to be capable of embracing the latter and has a tail portion **31** intended to lie in the channel **23** of the flashing **21** over the tongue **25** of a ridge filler piece **24**.

In the construction of the roof the sloping metal coverings constructed from metal sheets **1** are attached to purlins **13** in the manner described with reference to FIGS. 1 and 2 or in a similar manner. Where the roof has a relatively steep pitch, i.e. 6° or more, it is desirable to bolt the sheet **1** direct to the purlins as can be seen on the right-hand side of FIG. 3. The metal flashing **21** is then laid in position to cover the gap **20** at the ridge and ridge filler pieces extending between adjacent channels **2** and **3** in the metal sheets **1** are slipped into position with the tongues **25** engaged in the channels **23**, the supporting surfaces **26** supporting the flashing **21** and the lower longitudinal edges of the side flanges **27** resting on the metal sheets **1**. The portion **30** of a ridge clip **29** is then slipped over each channel **3** with the tail portion **31** leading, this tail portion being pushed home into the channel **23** over the tongue **25** of a ridge filler piece **24** to clamp the latter firmly in position. Finally a part **32** of the folded longitudinal edge of the flashing is cut and folded downwardly on either side of the channel **3** to prevent the tail portion **31** of the ridge clip **29** being withdrawn. The roof and flashing are then firmly and positively locked in position.

What we claim is:

1. A metal sheet provided with a channel along each of two opposed parallel edges, the two channels opening in opposite directions and being dimensioned so that the walls of one channel are capable of extending into the other channel of a similar sheet, the free edge of the inner wall of one channel being turned over away from the outer wall thereof and the free edge of the outer wall of the other channel being formed with a hook portion adapted to engage the turned over portion of the one channel of a similar sheet.

2. A metal sheet according to claim 1 wherein the inner wall of the one channel has a height greater than the outer wall thereof and the latter is inclined inwardly of the one channel.

3. A metal sheet according to claim 2 wherein the inner wall of the other channel is inclined parallel to the outer wall of the one channel and has a height, measured internally of the said other channel which is substantially equal to that of the inner wall of the one channel.

4. A metal sheet according to claim 3 wherein the outer wall of said other channel is inclined parallel to the turned over portion of the inner wall of said one channel.

5. A metal covering constructed from a number of metal sheets and each metal sheet being provided with a channel along each of two opposed edges, the two channels opening in opposite directions, the free edge of the inner wall of one channel being turned away from the outer wall thereof and the free edge of the outer wall of the other channel being formed with a hook portion adapted to engage and hook over the turned away portion of the one channel of a similar sheet, and the walls of said one channel being extended into the other channel and the turned away portion of the inner wall of said one channel being engaged in the hook portion of the other channel of the adjacent sheet.

6. A metal covering according to claim 5, attached to a supporting member extending transversely of the direction of length of the channels by means of a clip engaging the free edge of the outer wall of the one channel of a metal sheet.

7. A metal covering according to claim 6, wherein the clip is connected to a further clip engaging the supporting member by a bolt.

8. A metal covering according to claim 7, in combination with a metal flashing and clip means engaging said other channel of a sheet and said flashing.

9. The combination according to claim 8, wherein the clip means comprises a first portion of substantially the same cross-section as that of said other channel and a tail portion, the first portion thereof embracing the said other channel of a metal sheet.

10. The combination according to claim 9, wherein the metal flashing is folded under and inwardly along one longitudinal edge to provide a channel and then folded under and outwardly to provide a further channel.

11. The combination according to claim 10, wherein the tail portion of the clip means is located in said further channel of the flashing.

12. The combination according to claim 11, wherein a filler piece is provided having a tongue engaged in said further channel of the flashing, a supporting face supporting the flashing and a side flange extending between the flashing and the metal sheet.

13. The combination according to claim 12, wherein the tail portion of said clip means extends over the tongue of the filler piece in said further channel of the flashing.

14. The combination according to claim 13 wherein a part of the folded longitudinal edge of the flashing on either side of the other channel of a metal sheet is cut and folded downwardly to prevent the tail portion of the clip means being withdrawn from the further channel in the flashing.

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