July 26, 1938. K. ROTH 2,124,830

METAL ROOFING

Filed April 18, 1936

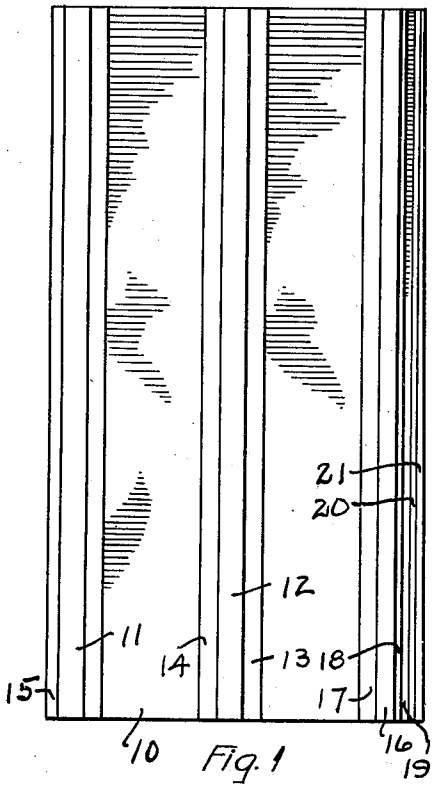


Fig. 1

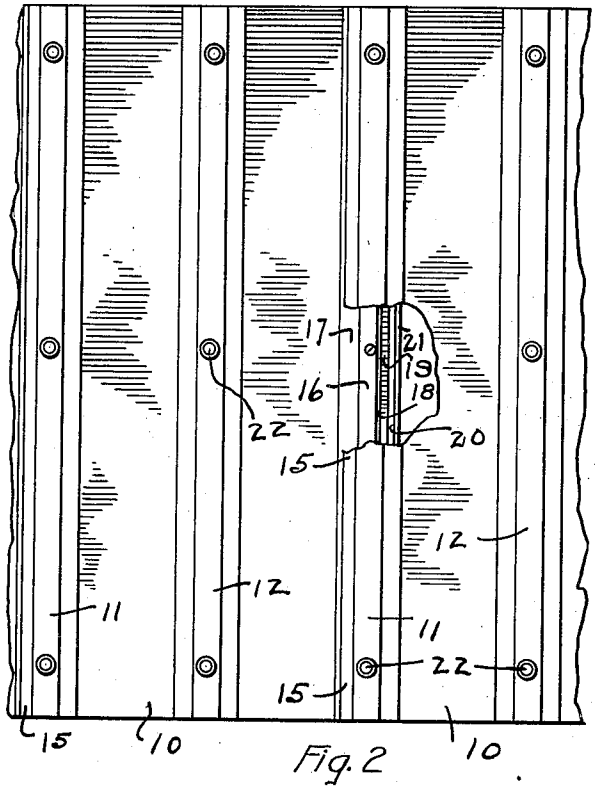


Fig. 2

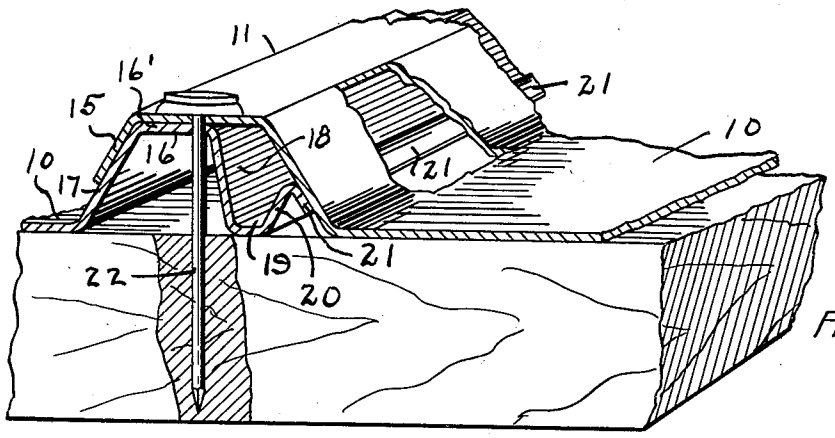


Fig. 3

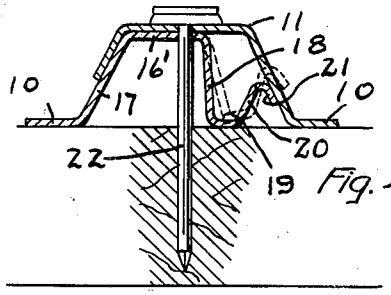


Fig. 4

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METAL ROOFING

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2 Claims. (Cl. 108—18)

This invention relates to the art of sheet metal roofing and particularly to means for insuring a tight side lap seal under compression. It is a primary object of my invention to form a sheet of metal in such manner that regardless of variations in width or in locating the metal under the forming dies or rollers, there will always be a line or area formed along one edge of the sheet which will be in compressive contact with a member lapping thereover from the second sheet. It is practically impossible to form a sheet with ribs which will have a raw edge upturned in such a manner that it may bear against the cooperating element of a second sheet and have a uniform contact entirely therealong throughout its length without having to shear off the angularity of that raw edge after the rib is formed.

The principal features and advantages of my invention herein described and shown will become more apparent in the following description of the invention as illustrated by the accompanying drawing in which;

Fig. 1 is a top plan view of a sheet formed to embody my invention;

Fig. 2, a top plan view of two sheets laid in overlapping relation;

Fig. 3, a detail in perspective on an enlarged scale showing the joint between the two sheets, and

Fig. 4, a detail in vertical section of the joint.

Like characters of reference indicate like parts throughout the several views in the drawing.

In the particular form of my invention as herein shown, the roof is made up of a plurality of like sheets **10** wherein ribs **11** and **12** are formed longitudinally across the sheet in spaced relation. The rib **12** is formed by bending the metal upwardly from the sheet to form a sloping leg **13** from the top of which the metal is carried horizontally or in parallelism with the sheet. A leg **14** on the other side slopes upwardly from the sheet and merges into the other side of the upper horizontal portion.

The rib **11** which is formed along one side of the sheet, here shown as the left hand side, is similar to the rib **12** but has the outer leg **15** shorter than the corresponding leg **14** so that the under edge of the leg **15** terminates at a distance above the upper side of the sheet. In other words the lower edge of the leg **15** is a raw edge of the sheet. Since it terminates above the level of the sheet, the lower edge of the leg does not necessarily have to be exactly parallel with the sheet since there is room for variation by reason of the spacing of that edge above the sheet.

On the other side of the sheet, I form a rib **16** which has an inner leg **17** corresponding in slope to the leg **14** of the rib **12**. From the upper end of the leg **17** is turned over horizontally a flat portion **16'**, the top of which is at an elevation corresponding substantially to the elevation of the under side of the rib **12**. The horizontal width of the upper flat portion of the rib **16** is less than that of the ribs **11** and **12**, being just a trifle more than half of those widths. From the outer edge of the flat portion of the rib **16** the metal is turned downwardly to form a leg **18** which approaches the vertical more nearly than does the opposite leg **17** and then is bent around from its lower end to form a gutter **19**, the under side of which is normally in contact with the roof sheathing or deck. In the form herein shown, this gutter **19** is formed to have a lower flat portion. From the outer side of this flat portion, the metal is carried upwardly to slope outwardly in approximate parallelism with the leg **17** to form the leg **20** and is carried upwardly a distance and then is turned around and bent downwardly and outwardly to form a sealing lip **21**, the outer upper face of which is normally positioned parallel with the slope of the leg **13**.

I am aware of the fact that heretofore this underlapping lip or ridge has been formed to have the upturned leg **20** terminate by a raw edge whereby this edge was intended to compressively bear against the under side of the leg of the overlapping ridge. However much difficulty has been experienced in so forming the sheet as to have this raw edge of the short leg **20** in exact parallelism with the overlapping leg with the result that a tight seal was not in fact maintained.

By carrying the leg **20** on around and turning it downwardly into the lip **21**, any variation in width of the sheet due to irregularities in cutting or due to the sheet passing through the forming rollers at a slight angle will be taken up in this lip. For example, Fig. 1, the lip **21** is indicated as being wider at the lower end than it is at the top, a condition brought about by the variation in width of the sheet or in the sheet not being run through the forming die or rolls squarely. This variation does no harm for the reason that as long as there is any width at all to the lip **21**, there still remains a sufficient amount of stock to be carried into parallelism with the sheet or leg thereof which is to lap over the lip. As a matter of fact, the bend between the leg **20** and the lip **21** is the one which determines the parallelism and of course being a formed part of the sheet can be controlled regardless of variations in the width.

Therefore by this simple expedient of providing the downturned lip 21 it is possible to form the sheet so that a uniform contact may be had between the edge of the underlapping sheet and the under side of the ridge of the overlapping sheet.

A further important advantage of this invention of providing the lip 21 resides in the fact that a more perfect bellows action is obtained as indicated by the dash lines in Fig. 4. In the normal forming of the underlapping ridge, the outer portion will generally be somewhat upturned as indicated by the dash lines so that when the ridge of the overlapping sheet is carried thereover, the members will be compressed within the confines of the overlapping ridge so that the outer face of the lip 21 is in compressive contact under considerable pressure with the inside of the upwardly sloping leg of the overlapping ridge. Of course by forming the underlapping ridge as above indicated to have the flat portion thereof terminate at just beyond the center of the overlapping ridge, the securing nail 22 may be driven downwardly through the overlapping ridge and through the underlapping ridge immediately adjacent the outer leg of the underlapping ridge which will tend to reenforce and prevent downwardly bending portions of the two ridges when the nail is driven therethrough. Furthermore any tendency toward distortion will tend to carry the lip 21 into further or greater compressive contact with the overlapping ridge.

By reason of the provision of the lip 21, no shearing of the finished formed sheet is required. Shearing is exceptionally objectionable since a very small sliver of metal would normally have to be cut from the sheet in order to straighten it and this sliver is dangerous to operators and difficult to dispose of.

While I have herein shown and described my invention in the one best form as now known to me, it is entirely obvious that structural variations may be employed without departing from the spirit of the invention and I, therefore, do not desire to be limited to that precise form beyond the limitations as may be imposed by the following claims.

I claim:

1. In a sheet metal roofing comprising a plurality of metal sheets overlapping one another at their edges, a metal sheet having the overlapping edge bent into a rib having a top parallel with the sheet, an outwardly sloping leg connecting the top with the body of the sheet and a leg on the other side of the top sloping outwardly from the top and shorter than the first leg, the underlapping edge of the sheet being bent unwardly from the sheet thence carried across parallel with the sheet a distance substantially less than the width of said top of the overlapping rib and bent down at a more acute angle than the leg connecting the top with the body of the sheet, thence carried down to slightly above the under side of the sheet and bent outwardly to form a plane surface slightly oblique to the surface of the sheet and then carried upwardly and outwardly and terminating in an outwardly and downwardly turned lip at an elevation below the top of the rib and in the path of the adjacent sloping legs of an overlapping rib in a roof assembly whereby the plane surface of the underlying rib will be moved down into parallelism with its sheet and its long leg nearer to a right angle with the sheet to better prevent crushing of the ribs in nailing the sheets to roof boards.

2. In a sheet metal roof having edge ribs on metal sheets lapped at the joints, the overlapped rib having outwardly sloping legs, and the underlapped rib having a correspondingly sloping leg next to the sheet but with the other leg swingable toward a vertical position into contact with the roof and having an extension carried upwardly to below the top of its rib and terminating with a lip crossing the path of the corresponding leg of the overlapping rib, the method of swinging the leg toward said vertical position by pressure of the overlapping rib against said lip and then driving a nail through both of the ribs into the roof board after the swingable leg is in closest to said vertical position and to hold the assembly.

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