

Nov. 1, 1932.

R. R. ROBERTSON

1,885,294

METHOD OF CORRUGATING SHEET METAL

Filed May 13, 1931

FIG. 5

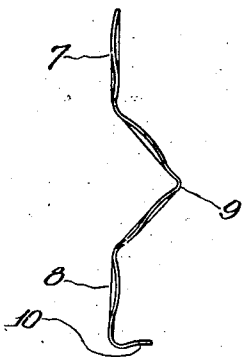


FIG. 1

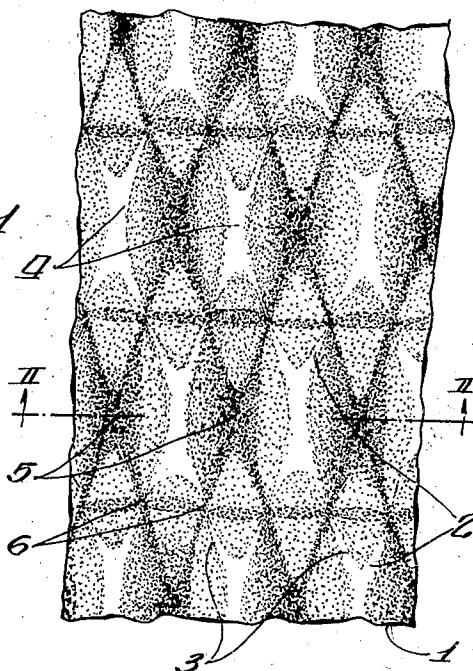


FIG. 3

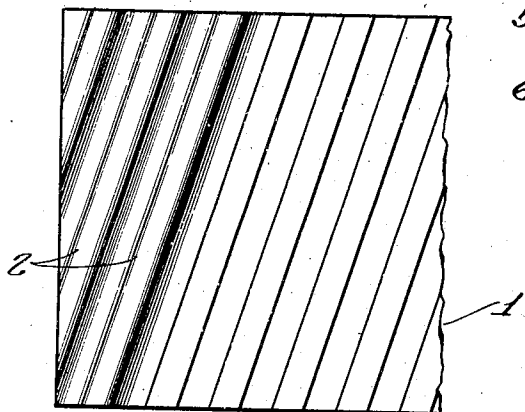


FIG. 4

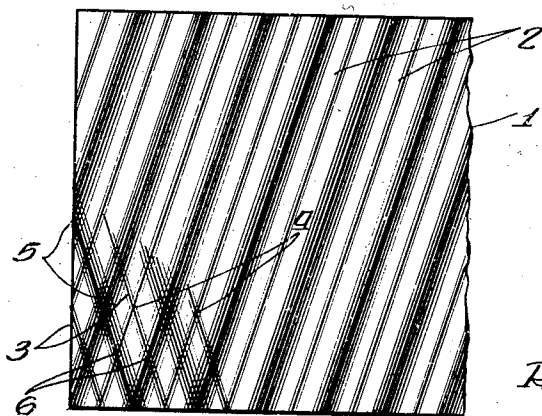


FIG. 2



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METHOD OF CORRUGATING SHEET METAL

Application filed May 13, 1931. Serial No. 537,028.

In concrete road construction work, sheet metal has been extensively used for making road center strips, contraction joint devices, and the like. In order to make the center strips and similar devices serviceable, it has been found that the sheet metal must be of a gage to afford sufficient thickness to the material so that the center strips or devices constructed out of the metal will stand up and meet State road requirements. In order to reduce the cost of concrete road construction work and also reduce the amount of sheet metal required for the formation of center strips and similar devices, this invention has been devised for the purpose of providing an improved and simplified method of cross-corrugating thin sheet metal to produce a stiffened and reinforced sheet metal having the strength of sheet metal of greater thickness and weight.

It is an object of this invention to provide a sheet metal material of comparatively light weight and thickness having crossed corrugations to strengthen the sheet metal to compare with the strength of sheet metal of greater thickness and weight.

It is also an object of this invention to provide an improved method of strengthening thin sheet metal by first diagonally corrugating the sheet metal and then turning the same bottom side up and providing the sheet metal with a series of diagonal secondary corrugations crossing and deforming the first group of corrugations.

It is a further object of this invention to provide an improved method for strengthening and reinforcing thin sheet metal, said method consisting of feeding a sheet of thin sheet metal at an angle between corrugating rolls to diagonally corrugate the material and then reversing the material by turning same upside down and again passing the same at an angle between the corrugating rolls to cross-corrugate the corrugated sheet.

It is an important object of this invention to provide an improved reinforced sheet metal adaptable for use in making road center strips and for other constructions requiring sheet metal, the improved reinforced sheet metal being formed with groups of diagonally positioned cross-corrugations formed by first passing a thin sheet of metal at an angle through corrugating or forming means and then turning over the partly corrugated sheet and again passing the same at an angle through the corrugated means to provide a second group of diagonally positioned corrugations crossing the first group of corrugations.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawing.

The invention (in a preferred form) is illustrated in the drawing and hereinafter more fully described.

On the drawing:

Figure 1 is a fragmentary top plan view of a cross-corrugated sheet metal embodying the principles of this invention;

Figure 2 is a detail sectional view of the material taken on line II—II of Figure 1;

Figure 3 is a fragmentary plan view of a piece of the sheet metal illustrating a few of the primary diagonal corrugations to illustrate the first step in the crimping operation;

Figure 4 is a fragmentary top plan view of the piece of material illustrating the first group of diagonal corrugations and a few of the secondary cross-corrugations produced by the second corrugating operation of the method; and

Figure 5 is an end view of a concrete road center strip formed of the cross-corrugated sheet-metal.

As shown on the drawing:

The present invention relates to an im-

proved sheet of non-annealed metal or, if desired, malleable or annealed metal.

The improved sheet metal is adapted to be cross-corrugated or ribbed by a simple method whereby the sheet of metal may be made out of comparatively thin material which, when cross-corrugated by the improved method, produces a strengthened or reinforced metal sheet of increased stiffness and strength permitting comparatively thin non-annealed sheet metal to be used in place of annealed sheet metal of greater thickness and weight.

The improved method for producing the cross-corrugated metal sheet consists of taking a comparatively thin sheet of non-annealed metal and first passing the same at a required or selected angle through a crimping or forming machine or between corrugating rolls to cause the sheet 1 to be formed with a series or plurality of parallel diagonal ribs or primary corrugations 2. After the sheet has been formed with the primary or main corrugations or ribs 2, the sheet is reversed or turned bottom side up and is again positioned at the selected angle to be fed through the forming or corrugating machine to cause the metal sheet to be formed with a plurality of parallel diagonal auxiliary or secondary corrugations cross the main or primary corrugations partially deforming the same so that the cross-corrugations or ribs reinforce or strengthen one another to produce a metal sheet of increased strength and stiffness.

It has been found that by cross-corrugating a plurality of sheets of non-annealed metal of substantially the same size that said sheets after being crimped or cross-corrugated by the improved method are all of substantially uniform size while when sheets of annealed metal of substantially the same size are cross-corrugated, the resultant corrugated sheets may vary in size or length.

The improved method thus permits the cross-corrugated sheet of non-annealed metal to be produced out of metal which is less expensive than annealed sheet metal and which when cross-corrugated will produce substantially uniformly sized corrugated sheets from stock sheets of uniform size, while when annealed sheet metal is used, the cost is greater and the resultant cross-corrugated products are not always of uniform size or length even when produced from stock sheets of uniform size.

It has been found that the improved cross-corrugated sheets which may be constructed of non-annealed or hardened sheet metal will produce a reinforced or strengthened metal sheet of less weight and cost when compared with plain sheet metal of greater weight and thickness and higher cost.

The cross-corrugated sheet of thin metal produces a stiffened and reinforced sheet

wherein the cross-ribs or corrugations produce integrally connected substantially diamond-shaped sections or units having high or apex portions 4 where the high portions of the cross-corrugations 2 and 3 intersect one another and with depressed portions or hollows 5 between the high or apex portions 4 substantially as illustrated in Figure 1. Where the high portions of the primary corrugations 2 cross the low portions formed between the secondary corrugations 3 and where the high portions of the corrugations 3 cross the depressions between the primary corrugations 2, partially depressed sections or points 6 are produced in the corrugated sheet.

Figure 5 of the drawing illustrates an end view of a concrete road center strip which is formed of the cross-corrugated sheet metal embodying the principles of this invention, whereby the cost of the road construction work may be materially reduced due to the fact that comparatively thin or light weight sheet metal can be used with said sheet metal being of non-annealed metal which is cheaper than the annealed sheet metal ordinarily used. The center strip shown in Figure 5 comprises a straight upper section 7 and a straight lower section 8 joined by an intermediate V-shaped section 9. Integrally formed at substantially right angles to the lower margin or edge of the lower section 8 is a base flange 10.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention, and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. The method of reinforcing material, comprising running the sheet material through a former at an angle to produce diagonal corrugations in the sheet material, and then turning the sheet material upside down and again running the same at an angle through the former to produce auxiliary corrugations intersecting the first formed corrugations.

2. The method of reinforcing sheet metal which consists in applying diagonal pressure to the sheet metal to produce diagonal main corrugations therein, and then turning the corrugated sheet metal upside down and again applying diagonal pressure thereto to produce diagonal auxiliary corrugations therein intersecting and distorting the main corrugations.

3. The method of reinforcing thin non-annealed sheet metal, comprising the subjecting of the metal to diagonal pressure to produce diagonal corrugations in the sheet metal, and then turning over the sheet metal and again subjecting the same to diagonal

pressure to produce auxiliary corrugations intersecting the first formed corrugations.

4. The method of reinforcing non-annealed thin sheet metal, consisting in advancing the same at an angle to subject the same to diagonal pressure to form diagonal corrugations in the sheet metal, and then turning over the corrugated sheet metal and again advancing the same at an angle and repeating the application of diagonal pressure to produce corrugations intersecting and deforming the first formed corrugations.

In testimony whereof I have hereunto subscribed my name at Chicago, Cook County, Illinois.

ROBERT R. ROBERTSON.

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