April 25, 1950 W. A. GRAY ET AL 2,505,241

METHOD OF MAKING OGEE GUTTER

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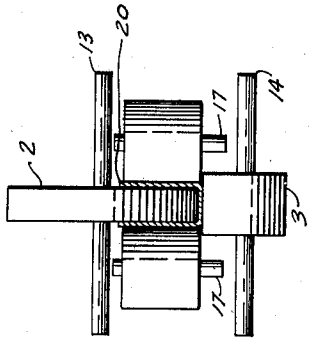


Fig. 4.

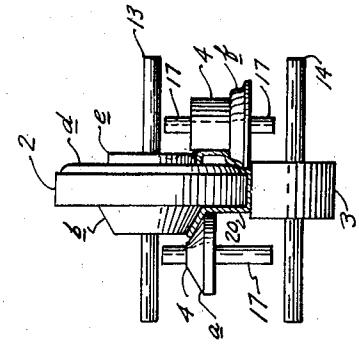


Fig. 7.

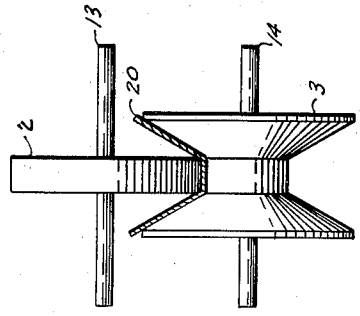


Fig. 3.

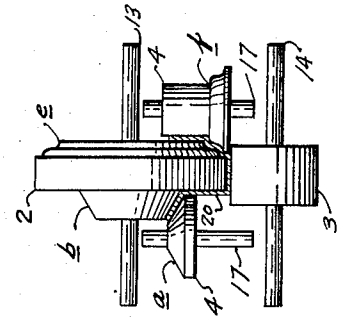


Fig. 6.

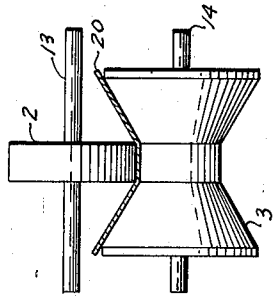


Fig. 2.

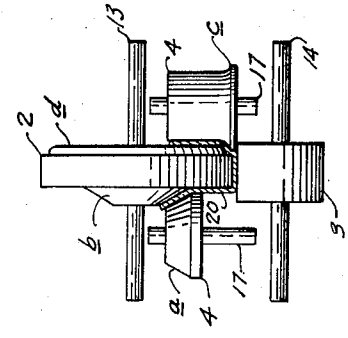


Fig. 5.

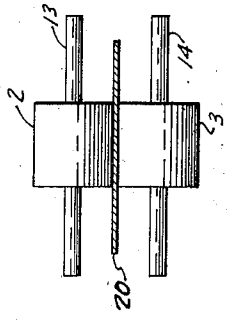


Fig. 1.

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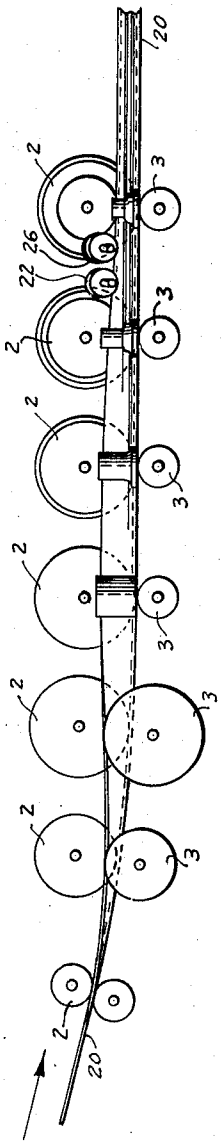


Fig. 8.

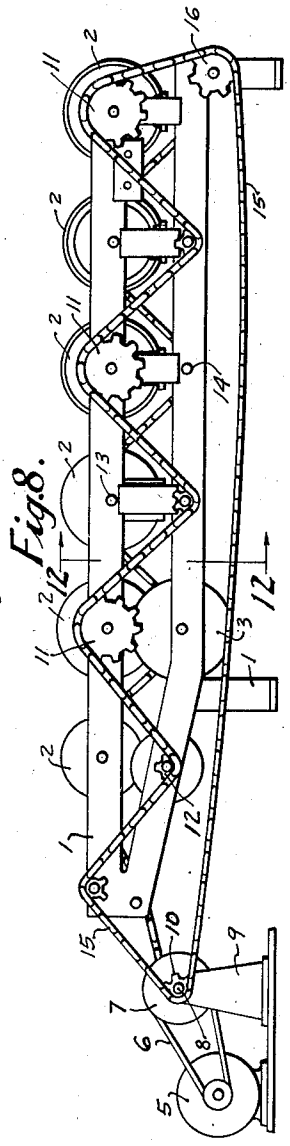


Fig. 9.

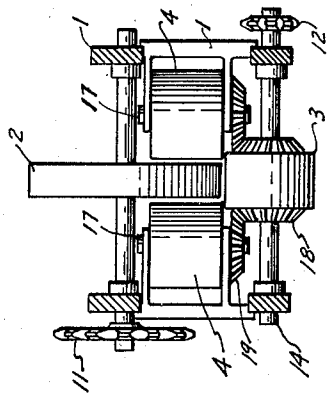


Fig. 12.

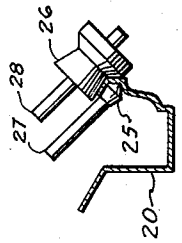


Fig. 11.

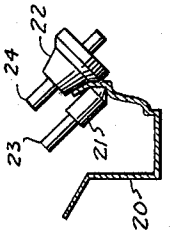


Fig. 10.

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Patented Apr. 25, 1950 2,505,241

UNITED STATES PATENT OFFICE

2,505,241

METHOD OF MAKING OGEE GUTTER

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Fort Worth, Tex.

Application September 25, 1946, Serial No. 699,292

3 Claims. (Cl. 153—28)

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This invention relates to a method of forming channels and the like from strip material.

An object of the invention is to provide a method of making deep channels in thin material without buckling or warping the same.

Another object of the invention is to provide a method of the described class whereby deep channels may be formed in thin material, and at the same time provide a reversed or ogee curve in the cross section of the same.

Particularly, the invention contemplates the use of a power roll machine for forming ogee gutter, such as attached to the eaves of houses.

These and other objects of the invention will become apparent from the following description of the accompanying drawing, wherein:

Figure 1 is an elevational view of a pair of rollers comprising the first stage of the operation of the present invention.

Figure 2 is a view similar to Figure 1, but showing the second stage of operation.

Figure 3 is a view similar to Figure 2 and showing the third stage of operation.

Figure 4 is a view similar to Figure 3 and showing the fourth stage of operation.

Figure 5 is a view similar to Figure 4 and showing the first step in forming the ogee curve and the rearwardly projecting attaching flange.

Figure 6 is a view similar to Figure 5 and showing the sixth stage of operation.

Figure 7 is a view similar to Figure 6 and showing further development of the ogee curve and the rearwardly projecting flange.

Figure 8 is a side elevational view of the rollers arranged in their relative positions, and particularly showing the manner in which the strip stock is fed into the machine, as well as the various stages of forming.

Figure 9 is a side elevational view of a machine embodying the present invention and showing the means employed for driving the various rollers.

Figure 10 is an elevational view of a pair of rollers for initially forming the said stiffening flange of the gutter.

Figure 11 is a view similar to Figure 10, but illustrating a step which further forms the referred to stiffening flange, and

Figure 12 is a lateral sectional view taken on lines 11—11 of Figure 10 and showing a typical arrangement for driving the vertically disposed side rollers.

Accordingly, the exemplary form of the invention shown includes a frame 1 supporting upper and lower horizontal rollers 2 and 3. The frame

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1 also supports vertically disposed side rollers 4 as shown in Figure 12.

As shown in Figure 9, the machine is provided with a prime mover 5, such as an electric motor, which is connected by a belt 6 with a driven pulley 7, the axis of which is parallel with the axes of the heretofore referred to upper and lower rollers 2 and 3. The driven pulley 7 is supported on a shaft 8 which, in turn, is supported upon a base 9.

Sprockets 10 are secured at each end of the driven shaft 8 and alternately drive upper and lower sprockets 11 and 12 affixed to the horizontal shafts 13 and 14 which, respectively, support and engage the upper and lower rollers 2 and 3, and are accordingly connected by driving chains 15.

In order to carry out the proper direction of rotation of the upper and lower rollers 2 and 3, idling sprockets 16 may be rotatably supported by the frame 1 at suitable places.

Referring now to Figure 12, those stages of operation requiring vertical rollers 4 include vertical shafts 17 rotatably supported by the frame 1 and are driven by beveled gears 18 and 19 secured, respectively, to the lower horizontal shafts 14 and the said vertical shafts 17.

Referring now to Figure 9, the strip material 20 is fed into the machine by a pair of feeder rolls 2 and 3 and are particularly shown in Figure 1. The last described arrangement comprises the first stage of operation. The second stage of operation, shown in Figure 2, is similar to the said first stage but differs in that the upper roller 2 is relatively narrow, whereas, the lower roller 3 includes opposing conical portions to form the material 20 in the shape of a flat-bottomed shallow V-shaped channel in cross section.

The third stage of operation, illustrated in Figure 3, is substantially the same as the second stage, but further forms the material 20 to provide a deeper channel.

As shown in Figure 9, the axes of the shafts 13 and 14 are disposed so as to feed the material 20 in the form of an arc during the first three stages. The purpose of the last described arrangement is to prevent buckling of the partially formed and angularly extending sides of the material 20, and is a feature of the present invention.

The fourth stage of operation, illustrated in Figure 4, includes driven vertical rollers 4 which form a U-shaped channel of the material 20.

The fifth stage of operation is similar to that of Figure 4, but differs in that one of the vertical rollers 4 is conical in shape, as at *a*, to coact with a corresponding conical portion *b* at the side of the upper horizontal roller 2 when the thickness

of the material is passed therebetween. The other vertical roller 4 is outwardly curved, as at *c*, to coact with a projection *d* on the other side of the upper horizontal roller 2. The flat bottom portion of the partially formed material 20 is acted upon by a driven lower horizontal roller 3 in each of the various stages. The periphery of the upper roller projection *d* is arcuate to conform with the portion *c* of the vertical roller 4.

The sixth stage of operation, shown in Figure 6, is similar to the fifth stage of operation but includes an additional projection *e* on the upper horizontal roller 2 and an additional step *f* in one of the vertical rollers 4. At the same time the connecting flange of the material 20 is further formed by changed angles of the conical portions *a* and *b* of the rollers 4 and 2.

The seventh stage of operation is substantially the same as the sixth, but includes variations in the profiles of the various rollers 2 and 4 and their projections *a*, *b*, *c*, *d*, *e*, and *f*. The forward stiffening flange of the material 20 is formed by a conical roller 21 within the partially formed gutter, and a coacting roller 22 outwardly thereof. The last referred to rollers 21 and 22 are mounted on shafts 23 and 24, respectively, which are mounted for free rotation on the frame 1. A second pair of rollers 25 and 26, also mounted on the frame 1 by shafts 27 and 28, respectively, further form the stiffening flange of the material 20.

In operation, the material is introduced into the machine by the feeder rollers 2 and 3 and is progressively acted upon by each of the various described stages, whereupon the strip material 20 emerges from the last stage in the form of completed ogee gutter.

What is claimed is:

1. The method of forming ogee gutter from a strip of sheet material between multiple pairs of rollers, comprising: progressively forming a U-shaped channel, forming an outwardly directed attaching flange along one side of the channel thus formed, and at the same time forming an ogee curve in the side of the channel opposite said attaching flange, and forming an inwardly directed stiffening flange along the upper edge of the side of said channel containing said ogee curve.

2. The method of forming ogee gutter from a strip of sheet material between multiple pairs of rollers, comprising: progressively forming a U-shaped channel, forming an outwardly directed flange along one side of the channel thus formed, forming an ogee curve in the side of the channel opposite said attaching flange, and forming an inwardly directed stiffening flange along the upper edge of the side of said channel containing said ogee curve.

3. The method of forming ogee gutter from a strip of sheet material between multiple pairs of rollers, comprising: progressively forming a U-shaped channel during which forming the material is arranged in the rollers in the form of an arc, forming an outwardly directed attaching flange along one side of the channel thus formed, forming an ogee curve in the side of the channel opposite said attaching flange, and forming an inwardly directed stiffening flange along the upper edge of the side of said channel containing said ogee curve.

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