Feb. 14, 1939. H. G. FLAGLER 2,146,949

EDGE BENDING DEVICE

Filed April 15, 1937 2 Sheets-Sheet 1

Fig. 1

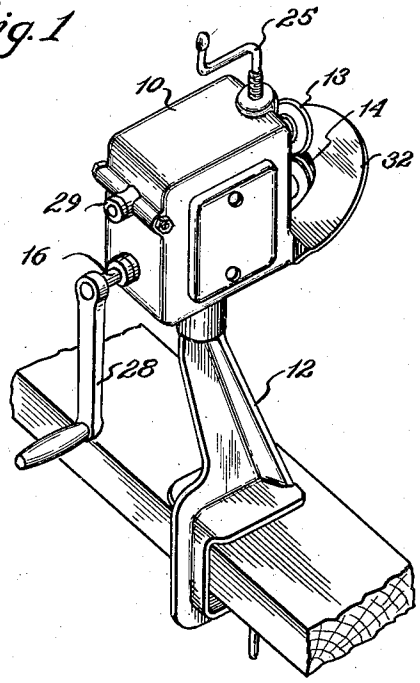


Fig. 3

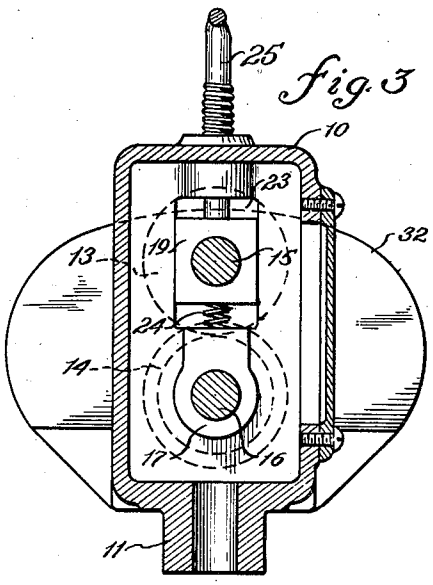
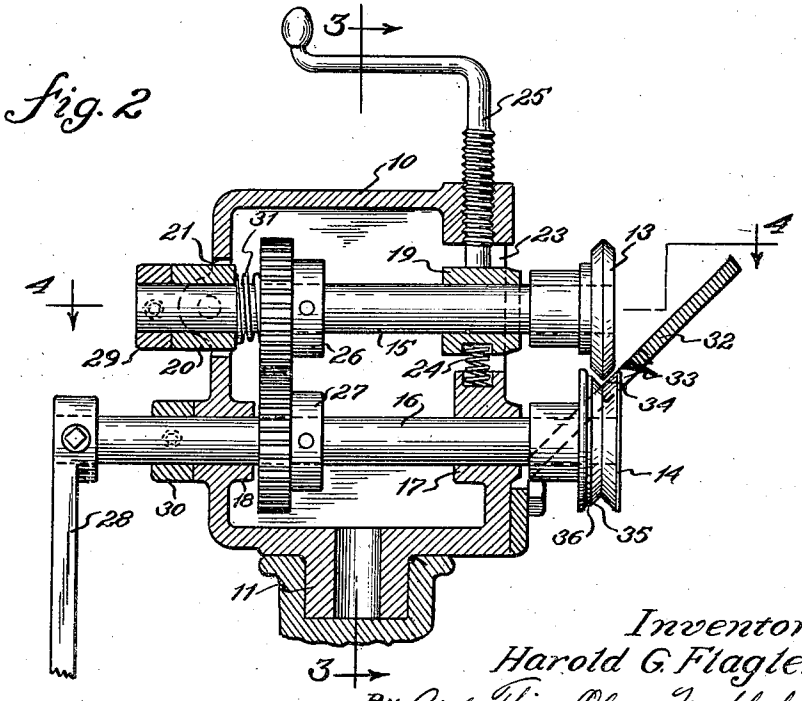


Fig. 2



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Fig. 4

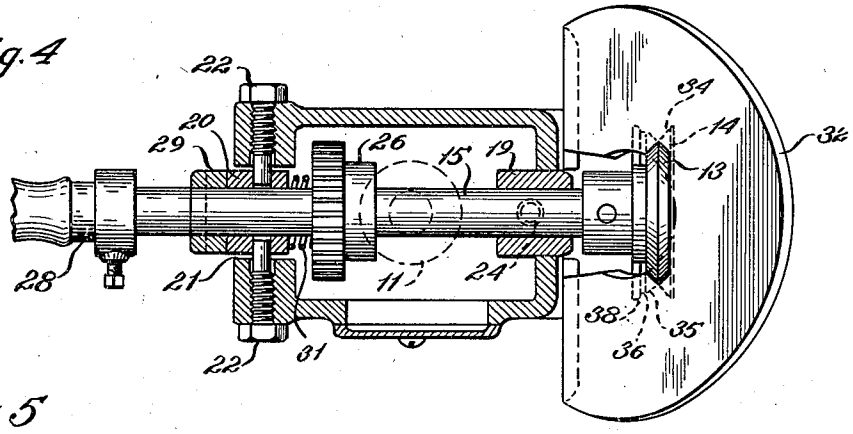


Fig. 5

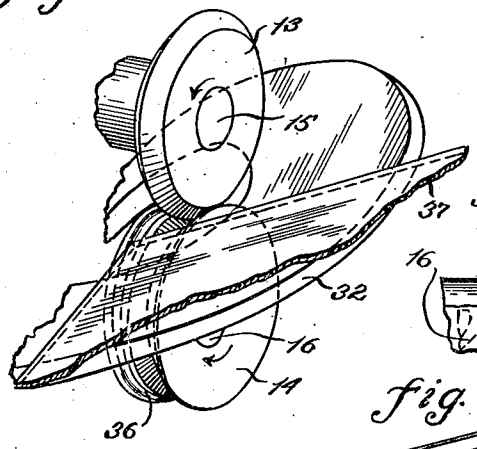


Fig. 7

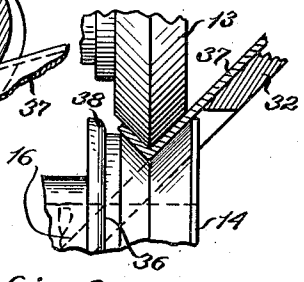


Fig. 8

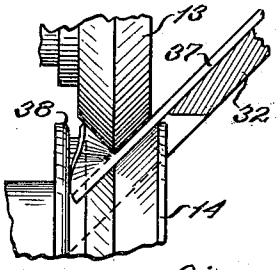


Fig. 9

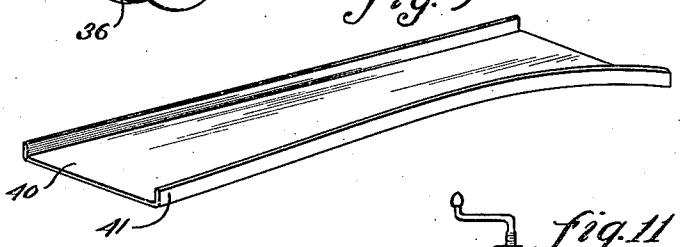


Fig. 6

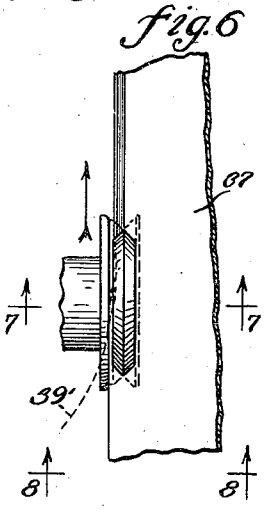


Fig. 11

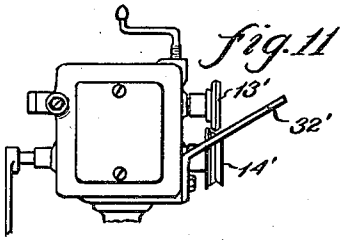
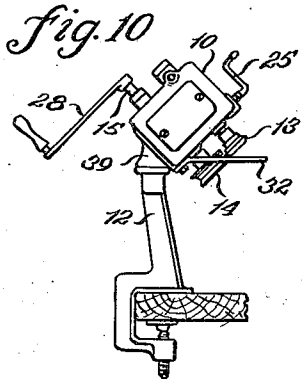


Fig. 10



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2,146,949

EDGE BENDING DEVICE

Harold G. Flagler, Chicago, Ill.

Application April 15, 1937, Serial No. 136,984

24 Claims. (Cl. 153—29)

My invention relates to devices for edging sheet material, more particularly to devices for flanging the edges of sheet metal, and has for an object the provision of a simple, reliable and inexpensive device of this character.

Various edge-bending or edge-turning devices for flanging sheet metal have heretofore been provided, having cooperating bending rolls simultaneously driven in opposite directions for engaging the sheet material to form edge flanges thereon. In devices heretofore known, difficulty has been encountered in producing flanged edges of uniform width and angularity, skillful handling and feeding of the sheet material by experienced operators being required in order to obtain products of approximate uniformity. Accordingly, various types of gauge means have been provided for edging devices of this character, some of which have been relatively, although not completely, satisfactory.

For example, edge-turning devices having edging rolls of the type in which the flange forming surfaces of the rolls extend at right angles to the axes of the rolls, have been provided with guide flanges spaced a predetermined distance from the flange forming surfaces so as to prevent variations in the width of the flange. In many cases, however, the edge-forming rolls are provided with flanging surfaces which extend at substantial angles to the axes of the rolls so as to provide in one roll a substantially V-shaped annular groove, the other roll having correspondingly beveled edges adapted to enter the groove. Such rolls have a somewhat longer life than the above described right angle rolls due primarily to the development of less severe end-thrust during the flanging operation, but the problem of properly guiding the sheet material to provide uniform flanges becomes more difficult when rolls of this latter type are employed.

In order to properly guide the sheet material when utilizing rolls of this latter type, auxiliary gauge members have been provided comprising rotatable gauge wheels supported in front of the point of engagement of the rolls, for guiding the sheet material into operative engagement with the rolls. While gauge wheels of this character are comparatively satisfactory when forming flanges on sheet material having straight edges, such gauge wheels leave much to be desired when curved edges are encountered, since the auxiliary gauge wheel must be adjusted relative to the edge-forming rolls whenever a different curvature is encountered. The necessity for such adjustment will be obvious when it is remembered that the gauge wheel is located an appreciable distance in front of the point of engagement of the edge-forming rolls.

Accordingly, something is yet to be desired in edge-forming devices of this character, and it is a further object of my invention to provide an edge-forming or flanging device having gauge means for insuring a uniform width of flange, which gauge means requires no adjustment regardless of the shape or curvature of the edge being flanged.

In carrying out my invention in one form, I provide a pair of cooperating edge-turning rolls, at least one of which includes a flanging surface against which the flange is formed on the sheet material, together with means including an annular groove or recess in the flanging surface for guiding the sheet material into cooperative relation with the two rolls. More specifically, I provide a support having a surface for supporting the sheet material, a pair of rotatable edge-forming rolls one of which is provided with an annular V-shaped groove, one wall of the groove being disposed in the plane of the supporting surface and the periphery of the other roll being beveled and adapted to enter and cooperate with the V-shaped groove in turning an edge flange on the sheet material. The other wall of the V-shaped groove constitutes the flanging surface against which the flange is formed, and this flanging surface is provided with an annular recess adjacent the outer edge thereof for engaging the edge of the sheet material so as to guide the sheet material along the supporting surface into cooperative relation with the edge-forming rolls, the annular recess cooperating with the beveled periphery of the other roll to form a preliminary bend in the sheet material. The portion of the flanging surface between the recess and the outer edge is rounded to permit proper engagement and guiding of sheet material having a concave edge to be flanged.

For a more complete understanding of my invention reference should now be had to the drawings, in which:

Figure 1 is a perspective view of an edge-turning device embodying my invention;

Fig. 2 is an elevational sectional view of the device shown in Fig. 1;

Figs. 3 and 4 are sectional views respectively taken along the lines 3—3 and 4—4 of Fig. 2;

Fig. 5 is a fragmentary perspective view of the edge-bending device with a sheet of material being fed thereinto;

Fig. 6 is a fragmentary plan view showing the edge-forming rolls with a sheet of material passing therethrough;

Figs. 7 and 8 are sectional views respectively taken along the lines 7—7 and 8—8 of Fig. 6;

Fig. 9 is a perspective view of a typical piece of sheet material having edge flanges formed thereon; and

Figs. 10 and 11 are, respectively, elevational views of modified forms of edge-bending devices embodying my invention.

Referring now to the drawings, I have shown my invention as applied to an edge-bending device comprising a box-like supporting frame or casing 10, the lower wall of which, as shown best in Figs. 3 and 4, is provided with a downwardly extending post 11 for engaging a socket in a bracket 12 (Fig. 1), which bracket 12 may be of any suitable type well known in the art. Within the casing 10 I provide suitable driving means for operating a pair of edge-forming rolls or wheels 13 and 14 which are disposed, as shown, outside of the casing 10 adjacent the front wall thereof. Although any suitable type of driving means may be employed, I have shown, for purposes of illustration, a pair of rotatable shafts 15 and 16 to which the edge-forming rolls 13 and 14 are respectively secured, the shaft 16 being journaled in suitable bearings 17 and 18, respectively, formed integrally in the front and rear walls of the casing 10, and the shaft 15 being journaled in suitable bearing blocks 19 and 20 which resiliently support the shaft 15 for limited movement relative to the shaft 16.

The bearing block 20 which supports the rear end of the shaft 15 is disposed, as shown best in Figs. 2 and 4, in an aperture 21 in the rear wall of the housing 10 and is supported for pivotal movement therein by a pair of pivot pins 22, which pivot pins extend through and threadedly engage suitable apertures in the casing 10, the innermost ends of the pivot pins 22 extending into cooperating holes or apertures in the bearing block 20. Similarly, the bearing block 19 is disposed in an aperture 23 (Figs. 2 and 3) in the front wall of the housing, the aperture 23 being elongated to permit vertical reciprocal movement of the bearing block 19, and a spring 24, disposed between the lower wall of the aperture 23 and the lower wall of the bearing block 19, resiliently urges the bearing block into abutting engagement with an adjustable stop member 25 which is threaded, as shown, cooperatively to engage a threaded aperture in the casing 10.

In order to provide for simultaneous rotation of the shafts 15 and 16 in opposite directions, I provide a pair of gears 26 and 27 respectively keyed to the shafts 15 and 16 and arranged in meshing relation, and the extending end of the shaft 16 is provided with suitable operating means here shown as a crank 28 providing for hand operation, although it will be apparent that the shaft 16 may be coupled to any desired driving means. Suitable collars 29 and 30 are respectively keyed to the shafts 15 and 16, which collars abuttingly engage the bearings 18 and 20, respectively, to restrain the shafts against axial movement in a right-hand direction, and a spring 31 surrounding the shaft 15 is provided between the bearing block 20 and the gear 26, which spring permits limited axial movement of the shaft 15 in order to provide for proper centering of the bending roll 13 relative to the bending roll 14. It will be apparent now that by reason of the above described mounting of the bearing blocks 19 and 20, the shaft 15 may be adjusted laterally of the shaft 16 simply by rotating the member 25 so as to adjust the bending wheels 13 and 14 for materials of different thickness.

Secured to the front wall of the frame 10 adjacent the lower edge thereof, I provide a support or guide plate 32, the upper surface of which comprises a supporting surface for supporting the material to be flanged, and it will be observed that this supporting plate 32 is provided with an aperture 33 through which the bending roll 14 extends, the periphery of the bending roll 14 being formed to provide an annular groove having a wall 34 disposed in the plane of the supporting surface of the plate 32, and a second wall 35 which extends substantially at right angles to the wall 34. As shown, the cooperating bending roll 13 is provided with a beveled periphery, the opposite surfaces of which extend substantially parallel to the walls 34 and 35 of the annular groove in the bending roll 14, the periphery of the roll 13 extending into the annular groove so as to cooperate therewith in turning an edge flange on a piece of sheet material. It will be apparent that when a piece of sheet material is disposed on the supporting plate 32 and fed between the rolls 13 and 14, the surface 35 is effective to bend the edge of the sheet material upwardly into engagement with the adjacent beveled surface of the roll 13 and, accordingly, the surface 35 constitutes the flanging surface of the roll 14.

In order properly to guide the sheet material between the rolls 13 and 14 so as to insure a uniform width of flange on the sheet material, the flanging surface 35 of the roll 14 is provided, in accordance with my invention, with an annular groove or recess 36 adjacent the outer edge of the surface 35, and, as shown best in Figs. 2 and 6, the portion of the flanging surface between the recess 36 and the outer edge of the flanging surface 35, is rounded for a purpose which will be more fully explained hereinafter.

Referring now to Figs. 5 to 8, inclusive, the manner in which the annular recess 36 cooperates with the supporting plate 32 to form gauge means for properly guiding the sheet material into cooperative engagement with the rolls 13 and 14, will now be described. In Fig. 5, a piece of sheet material 37 is shown supported on the plate 32, with the edge of the sheet material which is to be flanged engaging the annular recess 36 in the bending roll 14, and it will be assumed that the rolls 13 and 14 are being rotated in the respectively opposite directions indicated by the arrows. It will be apparent now that if the sheet material is moved inwardly toward the rotating rolls, the sheet material will first be engaged by the crest of the beveled surfaces on the roll 13 at a predetermined distance from the annular recess 36, and as the sheet material 37 is moved inwardly the recess 36 and the roll 13 cooperate to form a preliminary bend in the sheet material. As soon as the roll 13 engages the sheet material as described above, the rolls bite into the sheet material so as to draw it therebetween and complete the formation of a flange in a manner well understood in the art, the flange-forming operation being carried out as shown best in Figs. 6, 7 and 8.

It is believed that the manner in which the annular recess or groove 36 functions to guide the sheet material during the flange-forming operation will be apparent from Figs. 6, 7 and 8, and it will be observed that although the edge of the material moves away from the recess 36 during the flanging operation, as shown in Figs. 7 and 8, the edge of the portion not yet flanged is guided by the recess 36 as it approaches the flanging rolls 13 and 14.

While edge-bending devices embodying my invention are not limited thereto, they are particularly applicable to sheet materials of the type used in forming air conduits or ducts in heating and air conditioning systems. In such heating or air conditioning systems, it is often necessary to provide ducts having reversely

curved portions, and these ducts are ordinarily formed by flanging properly curved side walls which are later secured together to form the desired type of duct. Thus, in Fig. 9 I have shown a flanged member **40**, one side of which is defined by a reversely curved edge as indicated by the reference numeral **41**. In the past, considerable difficulty has been encountered in flanging sheets of the type shown in Fig. 9 due to the fact that it was necessary to adjust the gauge means of the edge-forming device whenever the curvature of the edge changed. It will be apparent, however, that with my improved gauge means the sheet of material will be properly guided into the bending rolls regardless of variations in the curvature of the edge being flanged.

As stated above, the portion of the flanging surface **35** on the roll **14**, which lies between the recess **36** and the outer edge of the roll, is rounded, as shown best in Figs. 6, 7 and 8, and the purpose of thus rounding this portion of the flanging surface is to permit proper guiding of sheet material having concavely curved edges to be flanged. It will be apparent that if a sharp corner is left at the point indicated by the reference numeral **38** in Figs. 7 and 8, and a sheet of material having a concavely curved edge, as indicated by the broken line **39'** in Fig. 6, is fed to the edge-forming rolls, the concavely curved surface would engage the corner so as to prevent the curved edge from properly nesting in the recess **36**, so that the sheet of material would not be properly guided to the rolls **13** and **14**.

While in the preferred form of my invention thus far described the shafts **15** and **16** extend horizontally so that the bending rolls **13** and **14** rotate in a vertical plane, and the plate **32** is inclined, as shown, it may sometimes be desirable, especially when flanging very wide sheets, to have the supporting plate **32** disposed in a horizontal position. In order to accomplish this it is necessary only to arrange the casing **10** at an angle, as shown in Fig. 10, by providing on the casing a properly formed post **39** for engaging the bracket **12**. If desired, of course, suitable bevel gears may be interposed between the handle **28** and the shaft **15** so as to provide for rotation of the handle **28** in a vertical plane.

In the embodiment of my invention shown in Figs. 1 to 9 inclusive, the cooperating surfaces of the edge-bending rolls **13** and **14** and the supporting surface of the plate **32** extend at angles of 45° with the horizontal to form right angle flanges on the sheet material, but it will be understood that my invention is not limited thereto since in many cases it may be desirable to form flanges of greater or less angularity. This may be accomplished, as shown in Fig. 11, simply by providing edge-bending rolls **13'** and **14'** having cooperating peripheral surfaces extending at the desired angles and by arranging the supporting plate **32'** in the plane of one pair of these surfaces. Thus in Fig. 11, the supporting plate is shown arranged at an angle of approximately 30° with the horizontal, and it will be understood of course that the device shown in Fig. 11 may be supported as shown in Fig. 10 if a horizontal supporting plate is desired.

While I have shown particular embodiments of my invention, it will be understood, of course, that I do not wish to be limited thereto since many modifications may be made and I, therefore, contemplate by the appended claims to cover any such modifications as fall within the true spirit and scope of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In an edge-turning device for forming flanges on sheet material, the combination of a pair of cooperating edge-turning rolls at least one of which is provided with a flanging surface against which the flange is formed, means for simultaneously rotating said rolls, and means including an annular gauge groove in said one roll defining one edge of said flanging surface for guiding the sheet material into cooperative engagement with said rolls the depth of said groove being on the same order of magnitude as the thickness of the sheet material.

2. In an edge-turning device for forming flanges on sheet material, the combination of a pair of cooperating edge-turning rolls at least one of which is provided with a flanging surface against which the flange is formed, means for simultaneously rotating said rolls, and means including an annular gauge groove in said one roll defining one edge of said flanging surface and adapted to engage the edge of the sheet material to be flanged for guiding the sheet material into cooperative engagement with said rolls, said gauge groove cooperating with the other one of said rolls to form a preliminary bend in the sheet material prior to said cooperative engagement.

3. In an edge-turning device for forming flanges on sheet material, the combination of a pair of cooperating edge-turning rolls at least one of which is provided with a flanging surface against which the flange is formed, means for simultaneously rotating said rolls, and gauge means integral with said one roll comprising an annular shoulder defining one edge of said flanging surface for engaging the edge of the sheet material to guide the sheet material into cooperative engagement with said rolls, the height of said shoulder being on the same order of magnitude as the thickness of said sheet material.

4. In an edge-turning device for forming flanges on sheet material, the combination of a support including a supporting surface for the sheet material, a pair of cooperating edge-turning rolls provided with flanging surfaces between which the flange is formed, said flanging surfaces being arranged at a predetermined angle to said supporting surface, means for simultaneously rotating said rolls, and an annular gauge groove in one of said rolls defining the outer edge of the flanging surface of said one roll for cooperating with said support to guide said sheet material between said rolls the depth of said groove being on the same order of magnitude as the thickness of said sheet material.

5. In an edge-turning device for forming flanges on sheet material, the combination of a support including a supporting surface for the sheet material, a pair of cooperating edge-turning rolls provided with flanging surfaces between which the flange is formed, said flanging surfaces being arranged at substantially right angles to said supporting surface, means for simultaneously rotating said rolls, and an annular gauge groove in one of said rolls at the outer edge of said flanging surface for cooperating with said support to guide said sheet material between said rolls, said gauge groove cooperating with the other one of said rolls to form a preliminary bend in the sheet material before said sheet passes between said rolls.

6. In an edge-turning device for forming flanges on sheet material, the combination of a support including a supporting surface for the

sheet material, a pair of cooperating edge-turning rolls provided with flanging surfaces between which the flange is formed, said flanging surfaces extending at a substantial angle to said supporting surface, means for simultaneously rotating said rolls, and an annular gauge groove in one of said rolls defining the outer edge of the flanging surface of said one roll, said groove being adapted to engage the edge of the sheet material and the depth of said groove being on the same order of magnitude as the thickness of said sheet material, said groove and said supporting surface cooperating to guide said sheet into cooperative engagement with said rolls.

7. In an edge-turning device for forming flanges on sheet material, the combination of a pair of rotatable edge-forming rolls one having an annular peripheral groove and the other adapted to have its periphery enter said groove and cooperate therewith in turning an edge flange on the sheet material, one side of said groove comprising a flanging surface against which said flange is formed, and gauge means including an annular shoulder on said one side of said groove defining an edge of said flanging surface for guiding the sheet material into cooperative engagement with said rolls.

8. In an edge-turning device for forming flanges on sheet material, the combination of a pair of rotatable edge-forming rolls one having an annular peripheral groove and the other adapted to have its periphery enter said groove and cooperate therewith in turning an edge flange on the sheet material, one side of said groove comprising a flanging surface against which said flange is formed, and gauge means including an annular recess in said one side of said groove defining the outer edge of said flanging surface, said recess being adapted to engage the edge of the sheet material to guide the sheet material into cooperative engagement with said rolls, said annular recess cooperating with the other one of said rolls to form a preliminary bend in the sheet material prior to said cooperative engagement.

9. In an edge-turning device for forming flanges on sheet material, the combination of a pair of rotatable edge-forming rolls, one having an annular peripheral groove and the other adapted to have its periphery enter said groove and cooperate therewith in turning an edge flange on the sheet material, a support including a supporting surface for the sheet material, one side of said groove extending at a substantial angle to said supporting surface and constituting a flanging surface against which said flange is formed, and gauge means including an annular shoulder on said one side of said groove defining an edge of said flanging surface cooperating with said supporting surface for guiding the sheet material into cooperative engagement with said rolls.

10. In an edge-turning device for forming flanges on sheet material, the combination of a pair of rotatable edge-forming rolls, one having an annular peripheral groove and the other adapted to have its periphery enter said groove and cooperate therewith in turning an edge flange on the sheet material, a support including a supporting surface for the sheet material, one side of said groove extending at substantially right angles to said supporting surface and constituting a flanging surface against which said flange is formed, and gauge means including an annular recess in said one side of said groove defining the outer edge of said flanging surface adapted to engage the edge of the sheet material as said material is fed into said rolls, said recess and said supporting surface cooperating to guide said sheet material into cooperative engagement with said rolls, the edge of said sheet material engaged by said recess moving out of said recess as said flange is formed.

11. In an edge-turning device for forming flanges on sheet material, the combination of a pair of rotatable edge-forming rolls, one having an annular V-shaped groove and the other having a beveled periphery adapted to enter and cooperate with said V-shaped groove in turning an edge flange on the sheet material, one wall of said groove constituting a flanging surface against which said flange is formed, and gauge means including an annular recess in said one wall for guiding the sheet material into cooperative engagement with said rolls.

12. In an edge-turning device for forming flanges on sheet material, the combination of a pair of rotatable edge-forming rolls, one having an annular V-shaped groove and the other having a beveled periphery adapted to enter and cooperate with said V-shaped groove in turning an edge flange on the sheet material, one wall of said groove constituting a flanging surface against which said flange is formed, and gauge means including an annular recess in said one wall for engaging the edge of the sheet material to guide the sheet material into cooperative engagement with said rolls.

13. In an edge-turning device for forming flanges on sheet material, the combination of a support having a surface for supporting the sheet material, a pair of rotatable edge-forming rolls, one having an annular V-shaped groove one side of which is in the plane of said supporting surface, the periphery of the other roll being beveled and adapted to enter and cooperate with said groove in turning an edge flange on sheet material supported on said supporting surface, the other side of said V-shaped groove constituting a flanging surface against which said flange is formed, and gauge means integral with said other side of said V-shaped groove for engaging an edge of said sheet material to guide said sheet material into cooperative engagement with said rolls.

14. In an edge-turning device for forming flanges on sheet material, the combination of a support having a surface for supporting the sheet material, a pair of rotatable edge-forming rolls, one having an annular V-shaped groove one side of which is in the plane of said supporting surface, the periphery of the other roll being beveled and adapted to enter and cooperate with said groove in turning an edge flange on sheet material supported on said supporting surface, the other side of said V-shaped groove constituting a flanging surface against which said flange is formed, and an annular recess in said other side of said V-shaped groove for engaging an edge of said sheet material, said recess and said supporting surface cooperating to guide said sheet material into cooperative engagement with said rolls.

15. In an edge-turning device for forming flanges on sheet material, the combination of a support having a surface for supporting the sheet material, a pair of rotatable edge-forming rolls, one having an annular V-shaped groove one side of which is in the plane of said supporting surface, the periphery of the other roll being beveled and adapted to enter and cooperate with said

groove in turning an edge flange on sheet material supported on said supporting surface, the other side of said V-shaped groove extending substantially at right angles with respect to said supporting surface and constituting a flanging surface against which said flange is formed, and gauge means integral with said other side of said groove for engaging an edge of said sheet material to guide said sheet material into cooperative engagement with said rolls.

16. In an edge-turning device for forming flanges on sheet material, the combination of a pair of cooperating edge-turning rolls at least one of which is provided with a flanging surface against which the flange is formed, and an annular gauge groove formed in said one roll adjacent the outer edge of said flanging surface adapted to engage an edge of the sheet material to be flanged for guiding the sheet material into cooperative engagement with said rolls, the portion of said one roll outwardly of said annular groove being rounded to permit proper guiding of sheet material having concave edges to be flanged.

17. In an edge-turning device for forming flanges on sheet material, the combination of a pair of rotatable edge-forming rolls one having an annular peripheral groove and the other adapted to have its periphery enter said groove and cooperate therewith in turning an edge flange on the sheet material, one side of said groove comprising a flanging surface against which said flange is formed, and an annular recess in said one side of said groove adjacent the outer edge of said flanging surface adapted to engage an edge of the sheet material for guiding the sheet material into cooperative engagement with said rolls, the portion of said one side of said groove between its recess and said outer edge being rounded to permit proper guiding of sheet material having concave edges to be flanged.

18. In an edge-turning device for forming flanges on sheet material, the combination of a support having a surface for supporting the sheet material, a pair of rotatable edge-forming rolls, one having an annular V-shaped groove one side of which is in the plane of said supporting surface, the periphery of the other roll being beveled and adapted to enter and cooperate with said groove in turning an edge flange on sheet material supported on said supporting surface, the other side of said V-shaped groove constituting a flanging surface against which said flange is formed, and an annular recess in said other side of said groove adjacent the outer edge of said flanging surface for engaging sheet material supported on said supporting surface to guide said sheet material into cooperative engagement with said rolls, the portion of said other side of said V-shaped groove between said recess and its outer edge being rounded to permit proper guiding of sheet material having concave edges to be flanged.

19. For use in an edge-turning device, an edge-turning roll having a V-shaped peripheral groove, one wall of which forms a flanging surface, said one wall having an annular recess therein adjacent the outer edge thereof, the depth of said recess being on the same order of magnitude as the thickness of the material to be flanged.

20. In an edge turning device for forming flanges on sheet material, the combination of a pair of cooperating edge turning rolls at least one of which is provided with a flanging surface which engages the outer surface of the flange during the flange forming operation, and means including an annular gauge groove in said roll adjacent the outer extremity of said flanging surface for guiding the sheet material into cooperative engagement with said rolls, the depth of said groove being less than the width of said flanging surface and on the same order of magnitude as the thickness of the sheet material.

21. In an edge turning device for forming flanges on sheet material, the combination of a pair of cooperating edge turning rolls at least one of which is provided with a flanging surface which engages the outer surface of the flange during the flange forming operation, and gauge means integral with said one roll comprising an annular shoulder adjacent the outer extremity of said flanging surface for engaging the edge of the sheet material to guide the sheet material into cooperative engagement with said rolls, the height of said shoulder being on the same order of magnitude as the thickness of said sheet material.

22. In an edge-turning device for forming flanges on sheet material, the combination of a support including a supporting surface for the sheet material, a pair of cooperating edge-turning rolls provided with flanging surfaces between which the flange is formed, said flanging surfaces extending at a substantial angle to said supporting surface, means for simultaneously rotating said rolls, and an annular gauge groove in the one of said rolls adapted to engage the outer surface of the flange, said groove being arranged to engage the edge of said sheet material and to cooperate with said supporting surface for guiding said sheet material into cooperative engagement with said rolls, the depth of said groove being on the same order of magnitude as the thickness of said sheet material and said edge of said sheet material being moved out of said groove during the flanging operation.

23. In an edge-turning device for forming flanges on sheet material, the combination of a pair of rotatable edge-turning rolls one having an annular peripheral groove and the other adapted to have its periphery enter said groove and cooperate therewith in turning an edge flange on the sheet material, one side of said groove comprising a flanging surface for engaging the outer surface of the flange during the flange forming operation, and gauge means including an annular recess in one side of said groove adjacent the outer edge thereof for engaging the edge of the sheet material to guide the sheet material into cooperative engagement with said rolls.

24. In an edge-turning device for forming flanges on sheet material, the combination of a pair of rotatable edge-forming rolls, one having an annular V-shaped groove and the other having a beveled periphery adapted to enter and cooperate with said V-shaped groove in turning an edge flange on the sheet material, one wall of said groove constituting a flanging surface for engaging the outer surface of the flange during the flange forming operation, and gauge means including an annular recess in said one wall adjacent the outer edge of said V for engaging the edge of said sheet material to guide the sheet material into cooperative engagement with said rolls.

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