United States Patent [19]

Kaval

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[54] **STOVE PIPE ELBOW**

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[52] **U.S. Cl.** ..... **29/157 A,** 29/416, 29/417, 138/169, 126/307 R, 113/116 UT

[51] **Int. Cl.** **B21d 53/00**

[58] **Field of Search** ..... 29/157 A, 412, 416, 417, 29/180 BJ, 180 SS, 190; 138/155–157, 162, 138/163, 166, 169; 113/116 UT, 116 EE, 113/120 K; 285/183, 424; 126/307 R

[56] **References Cited**

UNITED STATES PATENTS

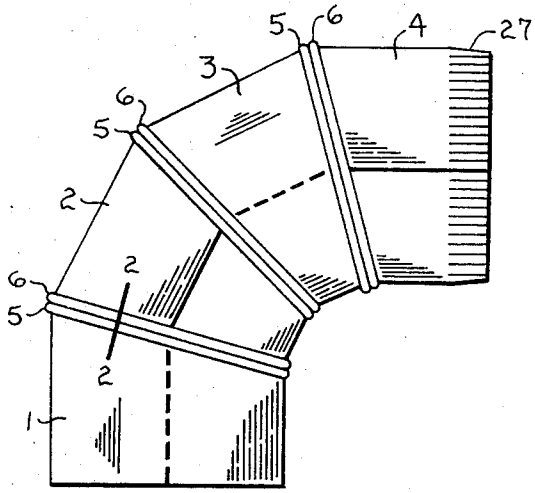
1,533,660	4/1925	Purnell	285/183
1,598,893	9/1926	Taylor	29/157 A
1,651,044	11/1927	Sladky et al.	138/166
2,006,863	7/1935	Holub	138/169
2,042,883	6/1936	Delaney	138/166
2,242,468	5/1941	Holub	126/307 R
2,482,558	9/1949	Scaringella	138/166
3,350,751	11/1967	Groschke	138/166
3,490,137	1/1970	Buck et al.	29/157 A

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[57] **ABSTRACT**

A swivel type stove pipe elbow having adjacent ungular sections joined end to end by interlocking slip joint means with each section having an axial lock seam extending to but not through the slip joint.

2 Claims, 10 Drawing Figures



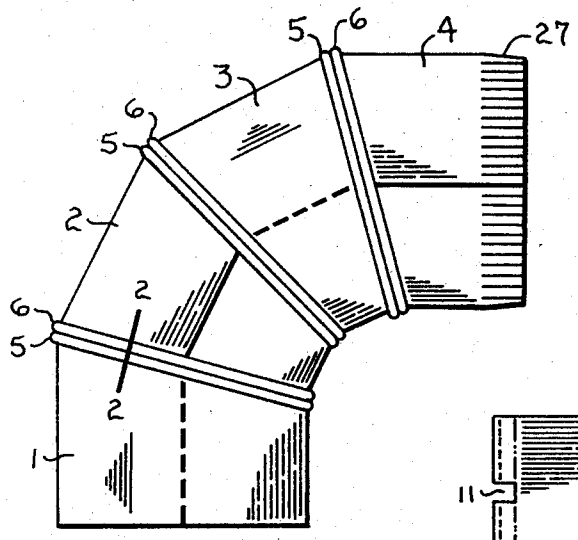


FIG. 1

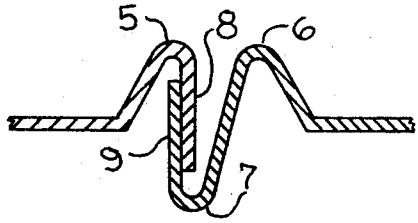


FIG. 2

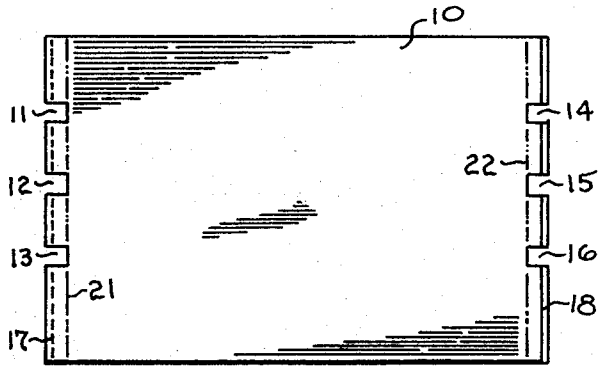


FIG. 3

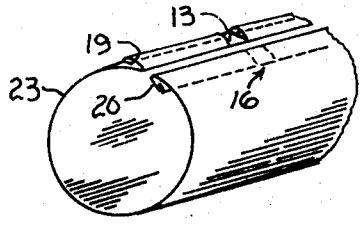


FIG. 6



FIG. 4

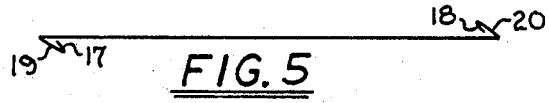


FIG. 5

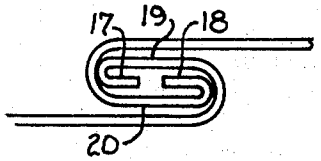


FIG. 7



FIG. 8

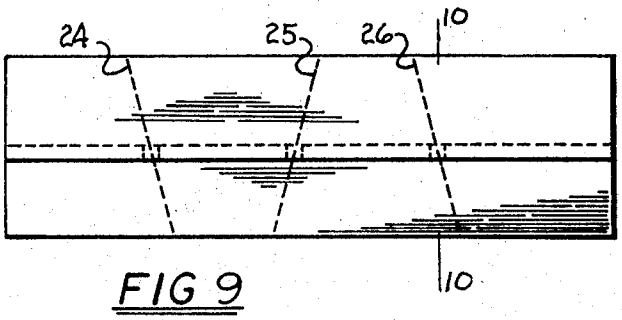


FIG 9

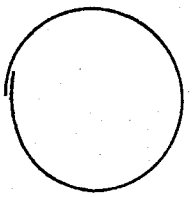


FIG 10

STOVE PIPE ELBOW

This invention is intended to improve the swivel type stove pipe elbow by constructing the ungular sections with a rigid axial lock seam which extends to but not through the slip joints connecting the sections end to end.

In the drawing, FIG. **1** is a side elevation of one form of elbow, FIG. **2** is a section on line **2—2** of FIG. **1**, FIG. **3** is a plan view of the blank from which the elbow is formed, FIG. **4** is an edge view of FIG. **3**, FIG. **5** is a view similar to FIG. **4** after the ends of the blank are formed for a lock seam, FIG. **6** is a fragmentary view of the blank rolled to a tubular shape in preparation for joining the ends by a rigid lock seam, FIG. **7** is a diagrammatic view showing the parts of the rigid seam assembled, FIG. **8** is a view of a FIG. **7** seam after the seam has been hammered together, FIG. **9** is a diagrammatic view showing the lines along which the tube is cut to provide the joint sections, and FIG. **10** is a sectional view of the joint on line **10—10** of FIG. **9.**

The invention is shown applied to a 90° elbow having ungular sections **1, 2, 3, 4** with adjacent ends of the section joined by interlocking slip joints consisting of hollow annular beads **5, 6, 7** and flanges **8, 9.** The external bead **5** terminates in an inwardly extending annular flange **8** which is received in internal bead **7.** The internal bead **7,** which is an extension of external bead **6,** terminates in an outwardly extending annular flange **9** which is received in bead **5.** The beads **5, 6** are in substantially abutting relation and the flanges **8, 9** prevent axial separation of the sections. By reason of the overlapping of the flanges **7, 8,** the adjoining sections are held together but are free to swivel to adjust the relative angular position of the sections.

The manufacture of the elbow starts with a generally rectangular blank **10** having end edges provided with notches **11-16** inclusive and with the end edges bent as indicated at **17, 18.** Notches **11, 12, 13** are respectively directly opposite notches **14, 15, 16.** After the initial bending as indicated at **17, 18,** the end edges are further bent as indicated at **19, 20** to form sections which may be interengaged to form rigid lock seams. The bending to form the sections **19** is along dot-dash line **21** and the bending to form section **20** is along dot-dash line **22.** Both of the lines **21, 22** are substantially through the bottoms of the notches **11-16** inclusive.

In the initial assembly, the blank **10** is first rolled in the form of a circular tube **23** as shown in FIG. **6.** The end edges of the rolled tube are then interlocked as shown in FIG. **7** and the interlocked seams are then hammered or pressed together to form the rigid lock seam as shown in FIG. **8.** Outside the notches **11-16** the lock seams have five thicknesses of metal and are, therefore, rigid. In the areas occupied by the notches **11-16** there are only two thicknesses of metal as indicated by the section on line **10—10** of FIG. **9.** From one aspect, the notches **11-16** interrupt the lock seams joining the end edges of the blank. The operations up to FIG. **9** are performed by lock seaming equipment. Other forms of lock seams which will prevent displacement of the end edges may be used.

After reaching the stage of FIG. **9,** the remaining operations required to complete the elbow are performed by slip seam forming equipment. The tube of FIG. **9** is cut in planes oblique to the axis of the tube and between adjacent ends of the lock seams as indicated by dotted lines **24, 25, 26** to form the ungular sections **1, 2, 3, 4.** The cut lines extend through the mid sections of notches **11-16** and are spaced from the adjoining ends of the lock seams so as to provide material for forming the slip joints. The machine which performs the cutting operation also forms the interlocking slip joint seams **5-9** inclusive. One of the cut edges is formed with external bead **5** and flange **8.** The adjacent cut edge is formed with external bead **6,** internal bead **7** and flange **9.** The edges of flanges **8, 9** are on the cut lines.

The ungular sections are assembled to form the elbow by compressing the beads **6, 7** radially inward until the flanges **9** clear the flanges **8** and can spring outward into the beads **5** upon release of the compression forces. The rigid lock seams **17, 18, 19, 20** prevent slippage during the slip joint forming and assembly operations. The manufacture is completed by crimping the end of section **4** as indicated at **27.**

The rigid axial lock seams **17, 18, 19, 20** are examples of a general type of seam which may be used. Such seams are adapted to high speed mass production. Such seams also produce a rigid construction which improves the structure and operation of the elbow.

The particular lock seam shown is known as a double roll hammerlock seam.

What is claimed is:

1. The method of making a swivel type stove elbow comprises the steps of forming a generally rectangular piece of sheet metal with opposite end edges having notches opposite each other, rolling the rectangular piece to a tubular shape with said end edges extending axially and with one end edge overlapping the other end edge, said notches registering and the bottoms of the notches in each end edge being overlapped by a portion of the sheet of the other edge, and forming the material outside the notches in rigid lock seams of the type which prevents displacement or unlocking of said end edges, the end edges in the space between said adjacent lock seams having only two thicknesses of metal in overlapping relation and the adjacent lock seams being axially spaced from each other a distance sufficient to provide material on opposite sides of a cut between the lock seams in a plane oblique to the axis of the tube for forming interlocking slip joint means between the sections formed by the cut, cutting the tubular shape in planes oblique to the axis of the tube and between adjacent lock seams, forming the material on one side of each cut into a first external annular hollow bead terminating in an inwardly extending flange, forming the material on the other side of each cut into a second external annular hollow bead joined to an internal annular hollow bead terminating in an outwardly extending flange, and assembling the sections on opposite sides of each cut with said inwardly extending flange in said internal bead and said outwardly extending flange in said first bead.

2. The method of claim **1** in which said lock seams are double roll hammerlock seams.

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