Feb. 21, 1939. D. A. MILLER ET AL 2,147,775

LOCK SEAM FOR PIPE

Filed May 20, 1938

Fig.-1

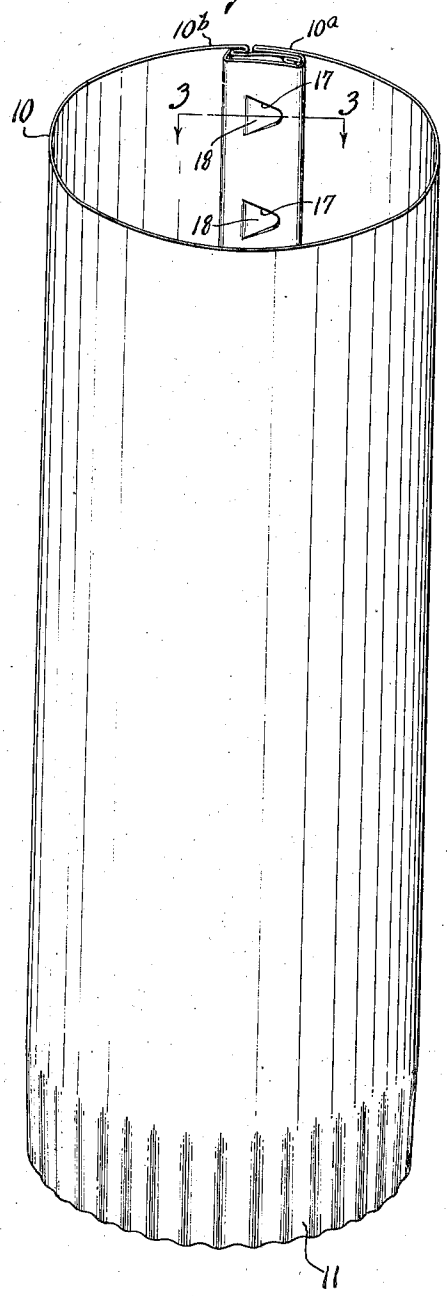


Fig.-2

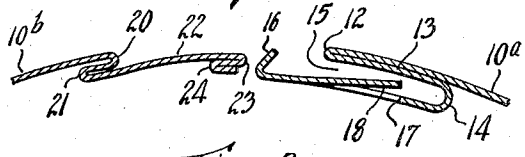


Fig.-3

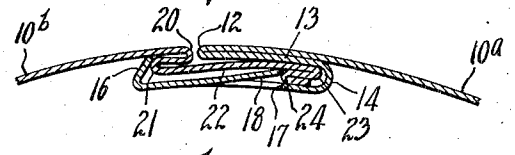


Fig.-4

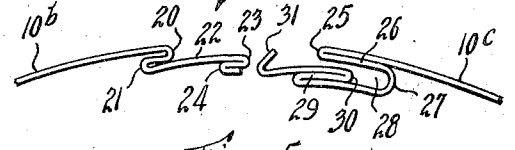


Fig.-5

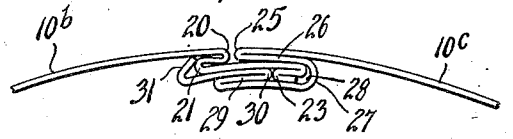


Fig.-6

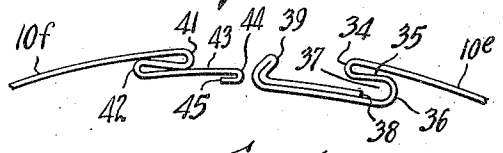
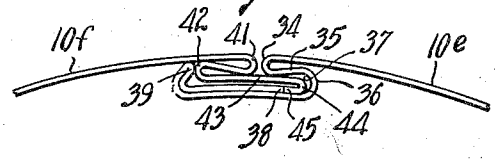


Fig.-7



INVENTORS
DONALD A. MILLER
AND
MYRON M. MILLER

BY Clyde Frye

ATTORNEYS

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LOCK SEAM FOR PIPE

Donald A. Miller, New Philadelphia, and Myron M. Miller, Dover, Ohio

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7 Claims. (Cl. 138—74)

This invention relates to lock seams for pipe, and more especially it relates to improved longitudinal seams of stovepipe sections by which the opposite lateral margins of sheet metal structures are joined to provide tubular lengths of stovepipe.

In the manufacture of stovepipe sections of the character mentioned, the lateral margins of the sheet metal structures are provided with interlocking formations, and the structures bent substantially to circular shape, but with the locking margins spaced apart to permit nesting of a plurality of the structures to conserve space and shipping expense. Subsequently the margins of the sections are brought together and locked by interengagement of the locking formations on said margins, such locking being effected by the tradesman or by the ultimate purchaser.

The chief objects of the invention are to provide an improved stovepipe of the character mentioned that will comprise a more securely locked seam than heretofore has been available; to provide a stovepipe section of which the locking formations are disposed interiorly of the pipe, and present little or no gap on the exterior of the pipe; to provide for ease of assembly without requiring the use of tools; and to provide a seam of the character mentioned that will not open even when the pipe is subjected to great heat. More specifically the invention aims to provide a stovepipe seam of which the locking formations are interengaged at two spaced points transversely of the pipe. Other objects will be manifest as the specification proceeds.

Of the accompanying drawing:

Figure 1 is a perspective view of a stovepipe section provided with an improved lock seam and constituting one embodiment of the invention;

Figure 2 is a fragmentary sectional view of the locking formations shown in Fig. 3, showing the same in open or unlocked position;

Figure 3 is a section on a larger scale, on the line 3—3 of Fig. 1;

Figure 4 is a fragmentary end view of a locking formation constituting another embodiment of the invention, the parts being shown in unlocked position;

Figure 5 is an end view of the parts shown in Fig. 4 in locked position;

Figure 6 is a view similar to Fig. 4 showing another embodiment of the invention; and

Figure 7 is a view of the parts shown in Fig. 6 in locked position.

Referring to the drawing, there is shown at 10 in Fig. 1 a typical stove pipe section of which one end portion thereof is crimped as shown at 11 to facilitate the joining of adjacent pipe sections. The crimping does not extend to the lateral edges of the pipe section, and therefore does not interfere with the locking formations thereon. The seam is formed by interlocking formations on the opposite lateral margins of the pipe structure, one of said formations being a female member designated 10*a* and the other formation being a male member designated 10*b*. The details of the interlocking formations 10*a*, 10*b* are best shown in Figs. 2 and 3 to which attention is directed.

In the female member 10*a* of the lock seam the marginal portion of the sheet metal of the pipe section is folded inwardly at 12 and backwardly upon itself as shown at 13, upon the interior of the pipe section, the metal then being folded in reverse direction as shown at 14, in parallel spaced relation to the portion 13, to provide a pocket or groove 15 therebetween. The metal constituting the inner wall of the pocket 15 extends substantially beyond the mouth of the pocket, that is, beyond the fold 12, and at its terminal region is bent outwardly to provide a locking shoulder 16, which preferably is inclined somewhat toward said pocket. At spaced points longitudinally of the pocket 15, the metal of the inner wall thereof is angularly incised at 17, 17 to form respective tongues of metal 18, the latter being bent so as to extend into the pocket 15 with their free ends directed toward, but spaced from, the bottom or closed end of the pocket. The tongues 18 constitute locking formations for engagement with a locking portion of the male member 10*b* as presently will be explained.

In the male member 10*b* of the lock seam the marginal portion of the sheet metal is bent inwardly and backwardly upon itself at 20, and inwardly and forwardly upon itself at 21, thus providing a reverse fold of which the fold 21 constitutes a locking formation, the distance between fold 20 and fold 21 being substantially the same as the distance between fold 12 and the raw edge of locking shoulder 16 of the female member of the seam. From the reverse fold described, the sheet metal extends forwardly beyond the bend 20 in the form of a tongue 22 that has its terminal portion reversely folded upon itself as shown at 23, throughout the entire length of the pipe section, the innermost bend of the fold, which is spaced somewhat from the edge of the member, being designated 24

and constituting a locking formation. The distance from the bend **20** to the extreme edge of fold **23** is slightly less than the depth of the pocket **15** of the female member **10***a*, and the distance from the locking formation **24** to the edge of fold **23** is slightly less than the distance from the free end of tongue **18** of the female member to the bottom of said pocket **15**.

The male and female members of the lock seam are shown in their assembled or interlocked relation in Fig. 3. To connect the two margins of the pipe structure it is only necessary to force the male member **10***b* into the female member **10***a*. In this operation the reversely folded free edge of the tongue **22** of the male member, including the locking formation **24**, passes between the locking shoulder **16** and bend **12** of the female member and enters the pocket **15** thereof. Moving toward the bottom of pocket **13**, the fold at the leading edge of the male member passes over the tongues **18**, the flexibility of the latter enabling this readily to be accomplished. The tongues **18** spring back to normal position as soon as the fold of the male member has passed, and are thus in position to engage the locking formation **24** of the male member to prevent retraction of the latter. When the leading end of the male member reaches the bottom of the pocket **15**, locking formation **21** of the male member has passed beyond the raw edge of locking shoulder **16** of the female member and readily slips into place beside said shoulder, the bend **20** of the male member then being disposed closely adjacent the bend **12** of the female member so that the exterior of the pipe presents a smooth, practically unbroken surface.

After the male and female members of the lock seam are interengaged as described, they will not come apart under severest service conditions. The superiority of the seam is the result of the use of two interlocking regions at spaced points transversely of the seam, whereby the several advantages set out in the foregoing statement of objects are achieved. The locking of the seam is readily effected manually without the use of tools of any kind.

In the embodiment of the invention shown in Figs. 4 and 5, the male member **10***b* is identical with the male member previously described so that no further description thereof is required. In the female member, designated **10***c*, the marginal portion of the pipe section is folded inwardly at **25** and backwardly upon itself as shown at **26**, upon the interior of the pipe section, the metal then being folded in reverse direction as shown at **27**, in parallel spaced relation to the portion **26** to provide a pocket or groove **28** therebetween. The metal constituting the inner wall of the pocket **28** is reversely folded at **29**, within the pocket, the innermost bend of said fold constituting a locking shoulder **30** disposed within the pocket and extending continuously the entire length thereof. The distance from the locking shoulder **30** to the closed side of the pocket **28** is slightly greater than the distance between the terminal edge **20** and the locking formation **23** of the male member **10***a*. From the reverse fold **29** the metal of the inner wall of the pocket extends forwardly beyond the mouth of the pocket, and at its terminal region is bent outwardly to provide a locking shoulder **31** similar to the locking shoulder **16** of the previously described embodiment.

When the male and female members **10***b*, **10***c*, respectively, are in interlocked relation, locking formation **24** is engaged by locking formation **30** within the pocket **28**, and locking formation **21** is engaged by locking formation **31** exteriorly of the pocket **28**, but interiorly of the pipe. Since the locking formations **24**, **30** are of double thickness of the metal, an especially strong interlock is provided, and which readily cannot become disengaged. This embodiment of the invention possesses all the advantages inherent in the first-described embodiment, and may be somewhat stronger for the reason that interlock of formations **24**, **30** is continuous throughout the full length of the pipe.

The embodiment of the invention shown in Figs. 6 and 7 comprises a female member **10***e* and a male member **10***f*. In the female member the marginal portion of the pipe section is folded inwardly at **34** and backwardly upon itself as shown at **35**, upon the interior of the pipe, the metal then being folded in reverse direction as shown at **36**, in spaced relation to the portion **35**, to provide a pocket or groove **37** therebetween. The metal constituting the inner wall of the pocket **37** extends well beyond the mouth of the pocket, that is, beyond the fold **34**, and is of double thickness, the raw edge of the metal sheet being disposed within the pocket, in spaced relation to the closed side of the latter, said raw edge constituting a locking formation **38**. Laterally beyond the mouth of the pocket **37**, the outer or marginal portion of the double-thickness structure is bent outwardly with relation to the axis of the pipe section to provide a locking formation or shoulder **39**, said shoulder preferably being inclined somewhat toward the fold **34**. Because of its double wall, the locking formation **39** is materially strengthened so that it will not straighten out under heat and/or lateral strain, and it is not readily bent or damaged in transit.

In the male member **10***f* of the seam the marginal portion of the pipe section is bent inwardly and backwardly upon itself at **41**, and inwardly and forwardly upon itself at **42**, thus providing a reverse fold of which fold **42** constitutes a locking formation. From the reverse fold described the metal extends forwardly beyond the bend **41** to provide a tongue **43** the terminal marginal portion of which is folded inwardly upon itself at **44**, the raw edge of the tongue constituting an underlying locking formation **45**.

Interlocking of the male and female members of the seam is accomplished by inserting the tongue **43** into the pocket **37** of the female member **10***e*. When said tongue reaches the closed side of the pocket the locking formation **45** of the tongue drops into edge-to-edge relation with the raw edge locking formation **38** in said pocket, thus preventing retraction of the tongue. When the locking formations **38**, **45** are in interlocked relation, the fold **42** of the male member will slip into juxtaposition with the locking shoulder **39** of the female member, the arrangement being such as to provide the double interlock characteristics of the invention.

The primary advantage of the invention is that the seam will not open even under severest service conditions. Furthermore, the pipe presents a neat appearance due to the fact that the interlocking elements are disposed interiorly of the pipe, there being but a slight seam-gap exposed to view from the exterior of the pipe. In each embodiment of the invention, the metal of the inner wall of the pocket extends laterally a substantial distance beyond the mouth of the pocket, thus being adapted to serve as a guide to facili-

tate the insertion of the male element into the pocket.

Modification may be resorted to without departing from the spirit of the invention, or the scope thereof as defined by the appended claims.

What is claimed is:

1. A stovepipe section having an interlocking seam consisting of a male member along one edge thereof and a female member along the opposite edge, said male member comprising a reversely bent portion comprising a locking formation and a tongue, the terminal marginal portion of the latter being folded inwardly upon itself to provide a second locking formation spaced laterally of the first mentioned locking formation, said female member comprising an inwardly reversely bent portion defining a pocket in which the tongue of the male member is receivable, a locking formation within said pocket interengageable with the locking formation on the terminal marginal portion of the tongue, the inner wall of said pocket extending beyond the mouth thereof and being formed with an angular portion constituting a locking formation that is interengageable with the first mentioned locking formation of the male member.

2. A stovepipe section having an interlocking seam consisting of a male member along one edge thereof and a female member along the opposite edge, said female member comprising a reversely bent portion defining a pocket and having a locking formation disposed entirely within the pocket and a locking formation disposed exteriorly thereof, said male member comprising a reversely bent portion defining a locking formation and a tongue, the latter having a second locking formation coextensive with its terminal margin, said tongue being insertable in the pocket of the female member to effect interengagement of the locking formations on the male and female members.

3. A stovepipe section having an interlocking seam consisting of a male member along one edge thereof and a female member along the opposite edge, said female member comprising an inturned reversely bent portion defining a pocket, the inner wall of said pocket having a longitudinally extending series of spaced apart locking formations formed therein entirely within the pocket, said inner pocket wall extending beyond the mouth of the pocket and being formed with a locking shoulder at its outermost extremity, said male member comprising a reversely bent portion defining a locking formation that is engageable with the last mentioned locking formation of the female member, and a tongue that is receivable in the pocket of said female member and is formed with a marginal locking formation that is coextensive with the length of the seam and interengageable with the locking formations in the said pocket.

4. A stovepipe section having an interlocking seam consisting of a male member along one margin thereof and a female member along the opposite margin, said female member comprising an inturned reversely bent portion defining a pocket, the inner wall of said pocket being incised at spaced points longitudinally thereof and integral tongues struck out therefrom, said tongues being disposed entirely within the pocket and having raw edges facing the closed side of the pocket, said inner wall of the pocket extending beyond the mouth of the pocket and formed thereat with an outwardly extending locking shoulder, said male member comprising a reversely bent portion defining a locking formation that is interengageable with the last mentioned locking formation of the female member, and a tongue that is receivable in the pocket of said female member and is formed with an inturned marginal fold defining a locking formation that is interengageable with the raw edges of the locking tongues in said pocket.

5. A stovepipe section having an interlocking seam consisting of a male member along one edge thereof and a female member along the opposite edge, said female member comprising an inturned reversely bent portion defining a pocket, one wall of said pocket being reversely folded upon itself to define a locking formation entirely within the pocket, the inner wall of the pocket extending laterally beyond the mouth thereof and formed thereat with an outwardly extending locking shoulder, said male member comprising a reversely folded portion defining a locking formation that is interengageable with the last mentioned locking formation on the female member, and a tongue that is receivable within the pocket of said female member and is formed with a marginal fold defining a locking formation that is interengageable with the locking formation in the said pocket.

6. A stovepipe section having an interlocking seam consisting of a male member along one edge thereof and a female member along the opposite edge, said female member comprising an inturned reversely bent portion defining a pocket, the inner wall of said pocket reversely folded upon itself to define a locking formation within the pocket and extending longitudinally thereof, said inner wall of the pocket extending laterally beyond the mouth of the pocket and formed at its extremity with an outwardly turned locking shoulder, said male member comprising a reversely folded portion defining a locking formation that is engageable with the said locking shoulder of the female member, and a tongue that is insertable into the pocket of said female member, said tongue having its terminal portion folded under upon itself to define a locking formation that is interengageable with the locking formation within said pocket.

7. A stovepipe section having an interlocking seam consisting of a male member along one edge thereof and a female member along the other edge, said female member comprising an inturned reversely bent portion defining a pocket, the inner wall of said pocket extending beyond the mouth of the pocket in double wall thickness and being angularly bent at the terminal region of said double wall portion to provide a locking formation exteriorly of the pocket, the raw edge of the structure being disposed within the pocket and constituting a second locking formation, said male member comprising a reversely bent portion providing a locking formation engageable with the first mentioned locking formation on the female member, and a laterally extending tongue insertable in the pocket of said female member, the terminal portion of said tongue including a locking formation engageable with the raw edge locking formation located within said pocket.

DONALD A. MILLER.
MYRON M. MILLER.