

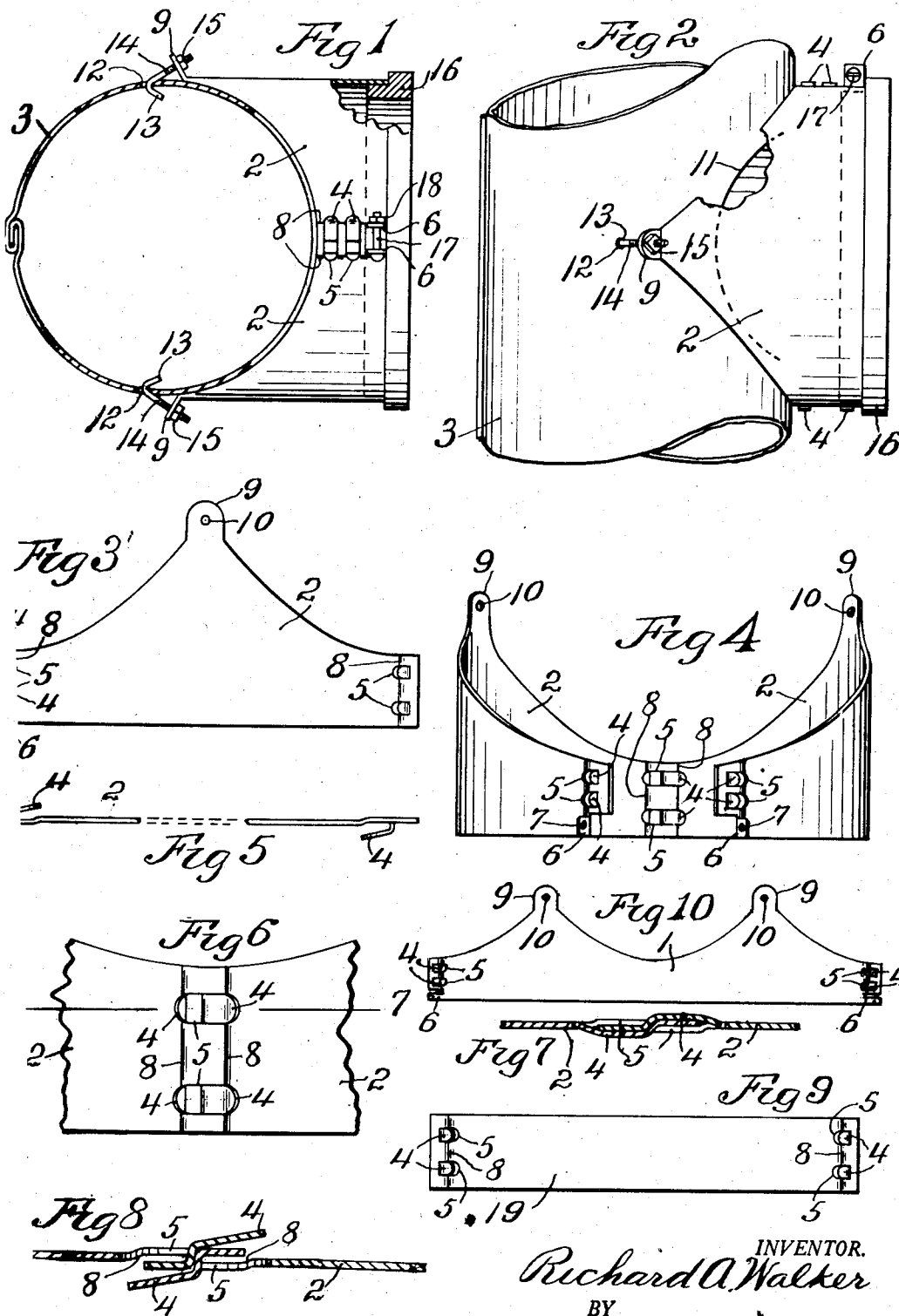
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SHEET METAL PIPE SECTION AND METHOD OF MAKING SAME

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SHEET METAL PIPE SECTION AND METHOD
OF MAKING SAME

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My invention relates to improvements in sheet metal pipe sections.

One object of my invention is to provide a sheet metal pipe section with novel means for securely, easily and cheaply fastening together longitudinal edge portions of the section, and which permits the pipe sections to be nested for storage or shipment, with their longitudinal edges disconnected, but to be connected when the sections are to be used.

A further object is to provide a novel method of fastening together the longitudinal edges of a sheet metal pipe section.

Still another object of my invention is to provide novel means for fastening a pipe section endwise to the periphery of another pipe section, to form a T or similar angular pipe section, and by which the two pipes will be securely held together and from relative movement.

The novel features of my invention are herein-after fully described and claimed.

In the accompanying drawing, which illustrates my invention,

Fig. 1 is a top view of my improved pipe section, partly broken away, of T joint type and embodying my improvements.

Fig. 2 is a side elevation, partly broken away, of the same.

Fig. 3 is a plan view of one of the pipe members prior to its being given an arcuate form.

Fig. 4 is a side elevation of the stub pipe with its longitudinal edge portions disconnected to adapt the pipe for nesting.

Fig. 5 is an edge view, partly broken away, of the member shown in Fig. 3.

Fig. 6 is an enlarged top view of a portion of the pipe section shown in Figs. 1, 2 and 4.

Fig. 7 is a section on the line 7—7 of Fig. 6.

Fig. 8 is a section of what is shown in Fig. 7, prior to the completion of the seam.

Fig. 9 is a stretch out view of a piece of sheet metal intended to be formed into a one piece pipe section, the end edge portions being provided with the seam forming features of my invention.

Fig. 10 is a stretchout view of a pipe section similar to that shown in Figs. 1, 2 and 4 but comprising a single piece of sheet metal.

Similar characters of reference designate similar parts in the different views.

My improved pipe section comprises a strip of sheet metal which may be a single piece, as the piece 1 in Fig. 10, which may be formed into the desired pipe form with overlapping longitudinal edge portions fastened together by my improved method to form a single longitudinal seam em-

bodying my improvement. Or the strip of sheet metal may comprise two or more pieces, as designated by 2 in Figs. 1, 2 and 4, the ends of which are connected together by my improved method to form a pipe section providing two longitudinal seams embodying my improvement.

In Figs. 1 and 2 is shown a pipe section embodying my improvement and comprising two members 2 fastened together, the pipe section having a form adapting it to be used as a stub pipe to be fastened at one end to the periphery of a cylindrical stove or furnace pipe section 3 to form therewith a T.

Each of the members 2 in each of its longitudinal edge portions has cut and depressed to one side thereof one or more tongues 4 spaced and extending away from the longitudinal edge portion and forming one or more slots 5. The slots 5 and tongues 4 of one edge portion are respectively transversely aligned with the slots 5 and tongues 4 of the other longitudinal edge portion. The tongues 4 of opposite edge portions are respectively depressed to opposite sides of the member 2, as shown in Figs. 5, 7 and 8.

As shown in Fig. 3, which illustrates one of the two similar members 2, one end edge portion is provided with an ear 6 having a perforation 7, the function of which ear will be explained hereinafter.

Opposite longitudinal edge portions of each member 2 are respectively provided with longitudinal shoulders 8, which are disposed at opposite sides respectively of the member and respectively intersect the adjacent slots 5.

In forming the pipe section, the two similar members 2 are reversely disposed and the end portions not provided with the ears 6 are connected together, as shown in Fig. 8, by overlapping said edge portions and inserting the tongues 4 of each portion through the slots 5 respectively of the opposite portion, so that one set of tongues of one portion extend inwardly and the tongues of the other portion extend outwardly through the slots 5, said tongues of each portion extending over the opposite edge portion beyond the longitudinal edge thereof.

The tongues 4 of each portion are then compressed, as by a pair of pliers, against the opposite portion, and the free end portions of the tongues are then bent across the longitudinal edges of the opposite edge portions and into the slots 5 respectively of the edge portions from which said tongues extend, as shown in Fig. 7, the tongues abutting at their inner ends against each other.

One set of ends of the members 2 are thus securely fastened together. The strip thus formed from the two members 2 is then formed to an arcuate shape, as shown in Fig. 4 with the free ends of the strip disconnected. In this form the partly completed pipe section may be nested in compact form with others for storage or shipment until desired for use. The longitudinal shoulder 8 of each longitudinal edge portion abuts against the longitudinal edge of the opposite edge portion, thus, in cooperation with the tongues 4 holding the edge portions from relative slipping on each other.

When the pipe section composed of the two members 2 is to be used, the free longitudinal edge portions are overlapped and fastened together in the same manner as has been described with reference to the fastening together of the other set of edge portions, the tongues 4 of each portion being respectively hooked through the slots 5 of the overlapping edge portion, and the free ends of the tongues being bent into the slots 5 of the member 2 from which the tongues extend.

One end of each arcuately formed member 2 converges from its opposite longitudinal edge portions away from the opposite end of the member to a central ear 9 having a perforation 10. When the free longitudinal edge portions of the pipe section are fastened together, as has been described, the end of the pipe section which is provided with the ears 9 is arcuately concave, so as to fit the periphery of the pipe section 3, and to cover a lateral opening 11 with which the pipe section 3 is provided.

The pipe section 3 is provided with two substantially diametrically opposite holes 12 through which are respectively inserted hooks 13 of two bolts 14, the oppositely threaded ends of which are respectively inserted through the holes 10 of the ears 9, which are outwardly bent and against which respectively bear nuts 15 respectively mounted on the threaded ends of the bolts 14.

The stub pipe section comprising the members 2 is thus securely fastened to the pipe section 3.

For tightly holding a ring 16 adapted for insertion into the outer end of the stub pipe section, shown in Figs. 1 and 2, the ears 6 are outwardly bent and a bolt 17 is extended through the perforations 7, the head of the bolt bearing against one ear 6 and a nut 18 on the bolt 17 being screwed tightly on the bolt against the other ear 6, thus contracting the outer end of the stub pipe, so that it tightly clamps the reduced inner periphery of the ring 16.

In the form shown in Fig. 10, the construction corresponds to that shown in Figs. 1 and 2, excepting that the pipe section is composed of a single piece of sheet metal, and the seam which connects the members 2 is eliminated, and in the provision of the ears 6 at each end of the single strip. The free ends of the member 1 are connected in the same manner, as are the free ends of the strip composed of the members 2, and have like connecting means comprising the tongues 4, slots 5 and shoulders 8. When circularly formed into a pipe section with its longitudinal edge portions fastened together, the pipe section formed from the strip 1 is fastened to a pipe section 3 in the same manner as has been described with reference to the fastening of the stub pipe section shown in Figs. 1 and 2. And in a similar manner, as has been described, the ring 16 is held clamped in the outer end of the stub pipe section formed from the strip 1.

In Fig. 9 is shown a strip 19 having parallel

side edges and provided in its end edge portions with tongues 4, slots 5 and shoulders 8, which correspond in structure and function to the similar parts in the other forms of my invention, shown in Figs. 1 and 10. When the strip 19 is circularly formed and has its longitudinal edge portions overlapped, it is fastened together by means of the tongues 4 entering the slots 5 of opposite edge portions and then being bent to enter the adjacent slots 5 and to lockingly engage the longitudinal edges of the opposite edge portions. The strip 19 may be of any desired width, and be provided within its limits with any desired number of tongues and slots.

With the employment of my improved fastening means, the longitudinal edge portions of a pipe section can be easily, quickly and securely fastened together with a simple implement, such as a pair of pliers.

One of the important features of my improved means for connecting the longitudinal edge portions of a sheet metal pipe, over the usual double seaming connection, is that with the latter an expanding strain on the pipe will tend to open the seam, due to the strain being applied to the longitudinal edges, while with my construction an expanding strain is applied to the shoulders at the inner ends of the tongues 4, where the tongues abut against each other, so that the greater the expanding strain the tighter will be the coupling connection between the longitudinal edge portions.

In like manner my improved seam connection will more efficiently resist collapsing under external pressure, due to the inwardly turned tongues 4, in addition to the contacting of the longitudinal edges with the shoulders 8.

With the employment of the bolts 14 having the hooks 13 inserted through the holes 12 of the pipe 3, combined with the bolts extending through the ears 9, which form abutments against which bear the nuts 15, the stub pipe 2 can be forced tightly against the pipe 3, the pipe 2 will be securely held from circumferential or longitudinal slipping on the pipe 3, thus enabling the elimination of the usual burring outwardly of that portion of the pipe 3 which is next to and encircles the opening 11.

Also with the use of the hook connection, the pipe 2 can be forced much tighter against the pipe 3, than is possible with constructions in common use which employ strips of metal embracing the side of the pipe 3 opposite to the pipe 2 and respectively connecting with opposite portions of the stub pipe 2, and in which the strips are drawn together by bolts. In the last described structures the frictional resistance of the strips against the periphery of the pipe 3, minimizes the drawing action on the stub pipe 2.

Various modifications of my invention, within the scope of the appended claims, may be made without departing from the spirit of my invention.

What I claim is:—

1. A sheet metal pipe section having two overlapping longitudinal edge portions having respectively two transversely aligned slots, two tongues extending respectively inwardly and outwardly through said slots and across opposite edge portions and abutting against each other at their inner ends, whereby said edge portions are held from moving apart and from outwardly sliding upon each other, one of said edge portions having a longitudinal shoulder against which the longitudinal edge of the other edge portions abuts

for holding said edge portions from inwardly sliding upon each other.

2. A sheet metal pipe section having two overlapping longitudinal edge portions having respectively two transversely aligned slots, and two tongues extending respectively inwardly and outwardly through said slots and across opposite edge portions, one of said tongues having its free end extended transversely into locking engagement with the longitudinal edge of the edge portion across which the last named tongue extends.

3. A sheet metal pipe section having two overlapping longitudinal edge portions having respectively two transversely aligned slots, and two tongues extending respectively inwardly and outwardly through said slots and across opposite edge portions, the free ends of said tongues extending into locking engagement with the longitudinal edges of said edge portions over which said tongues respectively extend.

4. A sheet metal pipe section having two overlapping longitudinal edge portions having respectively two transversely aligned slots, and two tongues extending respectively inwardly and outwardly through said slots and across opposite edge portions and abutting against each other at their inner ends, one of said tongues having its free end extended transversely into locking engagement with the longitudinal edge of the edge portion across which the last named tongue extends.

5. A sheet metal pipe section having two overlapping longitudinal edge portions having respectively two transversely aligned slots, and two tongues extending respectively inwardly and outwardly through said slots and across opposite ones of said edge portions and abutting against each other at their inner ends, and having their free ends extended respectively into locking engagement with the longitudinal edges of opposite ones of said edge portions.

6. A sheet metal pipe section having two overlapping longitudinal edge portions having respectively two transversely aligned slots, and having respectively two tongues extending inwardly and outwardly through the said slots of opposite edge portions and respectively across opposite ones of said edge portions, one of said edge portions having a longitudinal shoulder against which the longitudinal edge of the other edge portion abuts.

7. A sheet metal pipe section having two overlapping longitudinal edge portions having respectively two transversely aligned slots, and having respectively two tongues extending inwardly and outwardly through said slots of opposite edge portions and respectively across opposite ones of said edge portions, said edge portions having respectively two longitudinal shoulders against which the longitudinal edges of opposite ones of said edge portions respectively abuts.

8. A sheet metal pipe section having two overlapping longitudinal edge portions having respectively two transversely aligned slots, and having respectively two tongues extending inwardly and outwardly through said slots of opposite edge portions and respectively across opposite ones of said edge portions, and abutting against each other at their inner ends, the free end of one of said tongues being extended across the longitudinal edge of the opposite one of said edge portions and into the slot in the edge portion from which the last named tongue extends.

9. A sheet metal pipe section having two overlapping longitudinal edge portions having respec-

tively two transversely aligned slots, one of said edge portions having a tongue which extends through the slot of the opposite edge portion, across said edge portion and the longitudinal edge thereof and into the slot of the edge portion from which said tongue is extended.

10. A sheet metal pipe section having two overlapping longitudinal edge portions having respectively two transversely aligned slots, one of said edge portions having a longitudinal shoulder intersecting the slot in said edge portion, said edge portion having a tongue abutting at its inner end against the opposite edge portion and extending across the last named edge portion and the longitudinal edge thereof and into the slot which is intersected by said shoulder.

11. A sheet metal pipe section having two overlapping longitudinal edge portions having respectively two transversely aligned slots, one of said edge portions having a longitudinal shoulder intersecting the slot in said edge portion and against which shoulder the longitudinal edge of the opposite edge portion abuts, the edge portion having said shoulder being provided with a tongue which at its inner end abuts against the opposite edge portion and which tongue extends across the last named edge portion and the longitudinal edge thereof and into the slot which is intersected by said shoulder.

12. A sheet metal pipe section having two overlapping longitudinal edge portions respectively provided with two longitudinal shoulders against which the longitudinal edges of said portions respectively abut, said edge portions having respectively two transversely aligned slots each intersected by the shoulder of the edge portion containing the slot, said edge portions having respectively two tongues which abut against each other at their inner ends and which extend respectively inwardly and outwardly through the slots of opposite edge portions and across the longitudinal edges thereof and into the slots from which said tongues respectively extend.

13. In a pipe section, the combination with a pipe having a lateral opening and two holes at opposite sides respectively of said opening, of another pipe fitted at one end against the periphery of said first pipe, with said end in register with said opening, and two anchoring members having respectively two hooks inserted through said two holes and having holding engagement with said first named pipe, and means adjustably connecting said anchoring means with said second named pipe by which the latter may be forced tightly against the first named pipe and reliably held from movement thereon.

14. In a pipe section, the combination with a pipe having a lateral opening and two holes at opposite sides respectively of said opening, of another pipe fitted at one end against the periphery of said first named pipe, with said end in register with said opening, and having two abutments at opposite sides respectively thereof, two bolts having at one set of ends two hooks extending respectively through said holes and having holding engagement with said first named pipe, and having their other set of ends threaded and respectively extended through said abutments, and two nuts respectively mounted on said threaded ends and respectively bearing against said abutments, and by which, when said nuts are properly adjusted said second named pipe may be forced tightly against said first named pipe and reliably held from movement thereon.

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