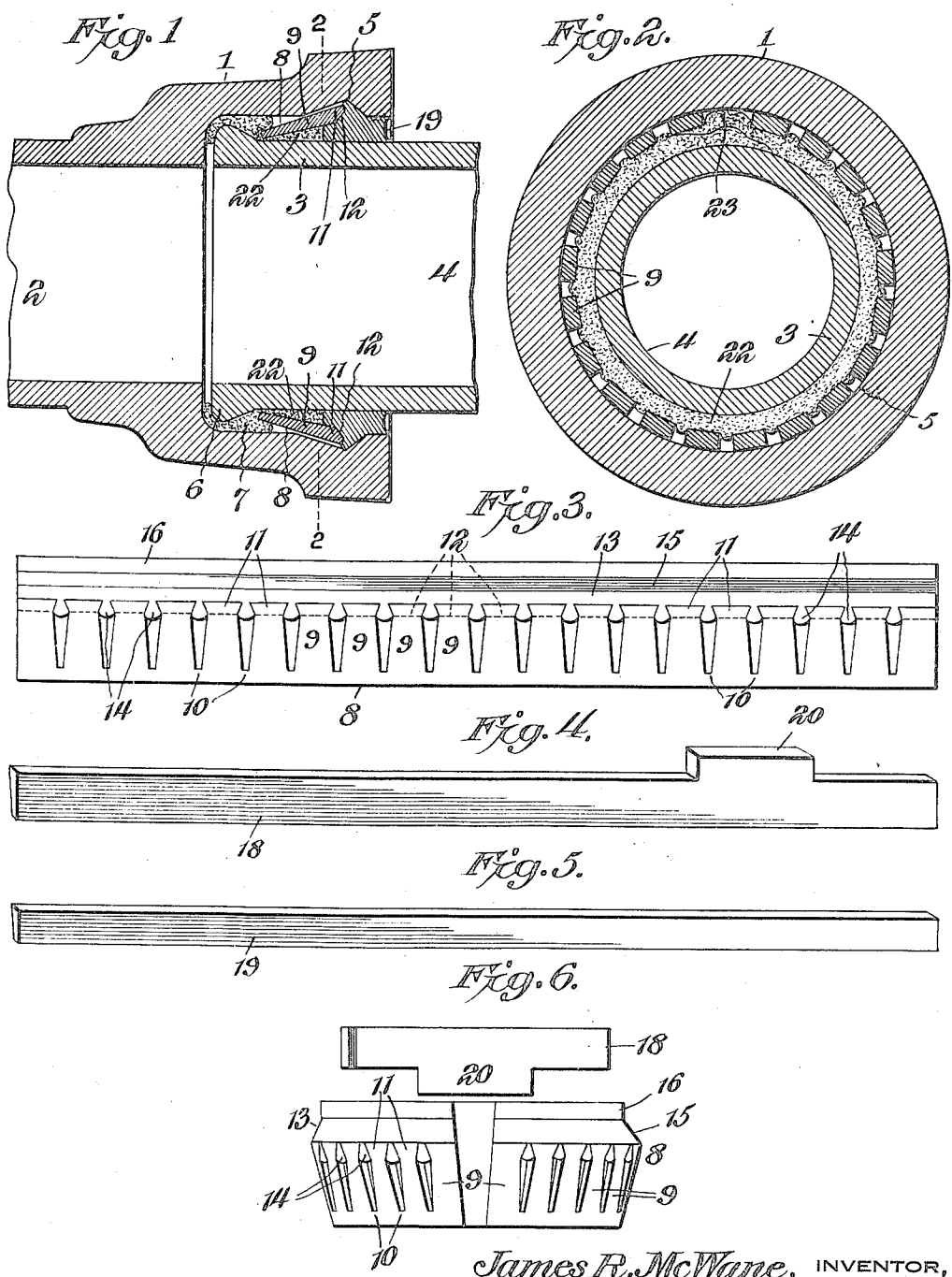


J. R. McWANE.  
 PIPE JOINT AND FILLER THEREFOR.  
 APPLICATION FILED JAN. 26, 1917.

1,248,362.

Patented Nov. 27, 1917.  
 2 SHEETS—SHEET 1.



WITNESSES

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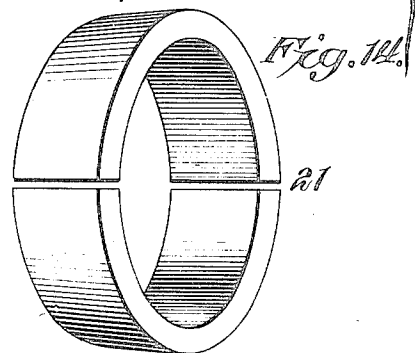
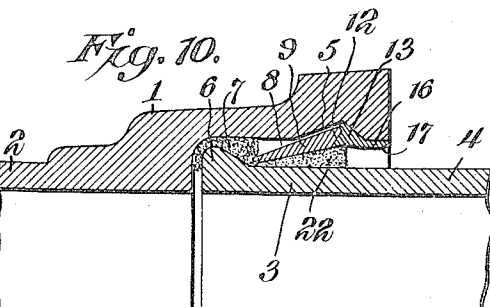
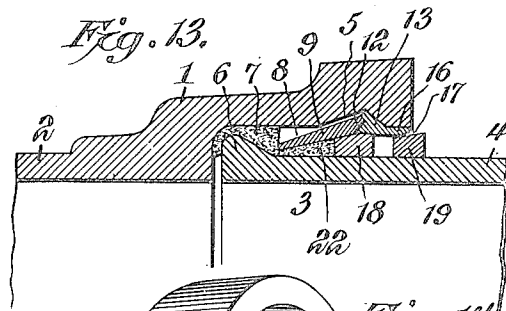
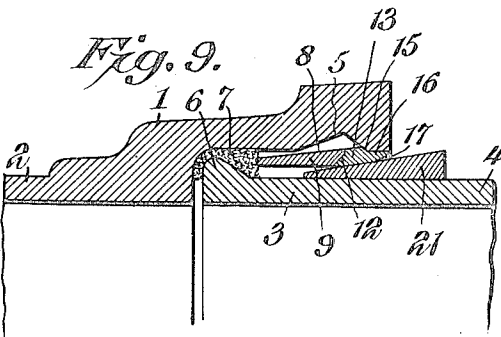
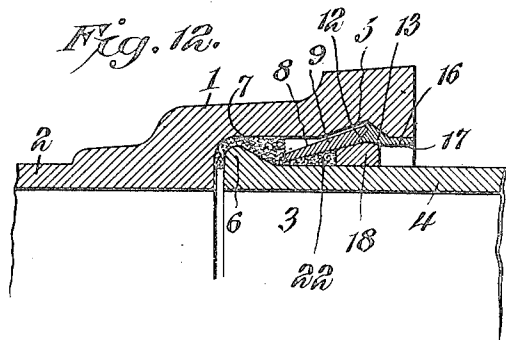
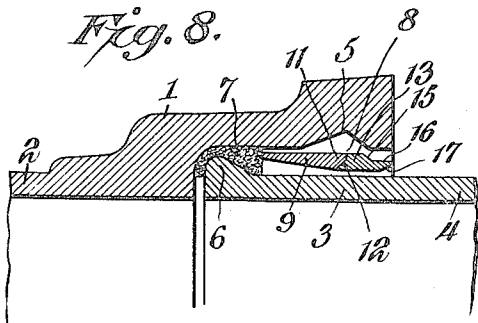
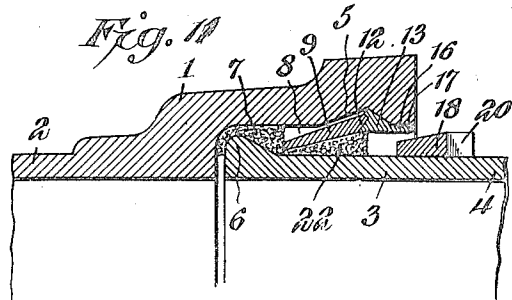
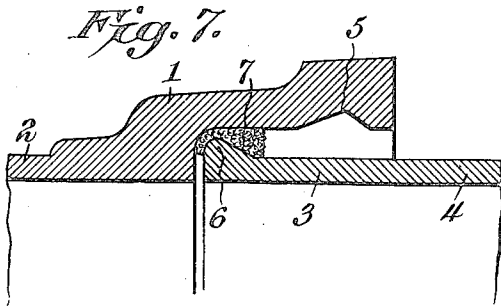
ATTORNEY

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# UNITED STATES PATENT OFFICE.

JAMES R. McWANE, OF BIRMINGHAM, ALABAMA.

## PIPE-JOINT AND FILLER THEREFOR.

1,248,362.

Specification of Letters Patent.

Patented Nov. 27, 1917.

Application filed January 26, 1917. Serial No. 144,768.

*To all whom it may concern:*

Be it known that I, JAMES R. McWANE, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented a new and useful Pipe-Joint and Filler Therefor, of which the following is a specification.

This invention has reference to pipe joints and fillers therefor, and its object is to provide a pipe joint structure for bell and spigot pipes, especially cast iron pipes, providing a desirable degree of flexibility and permitting the formation of a tight joint with a minimum amount of lead, a minimum amount of labor, and without wastage.

The invention comprises a joint for bell and spigot cast iron pipe in which jute or other packing material, a preformed filler of a metal such as iron, and preformed lead strips, are introduced into the bell of the pipe after the spigot end of the next pipe in order, is located therein, whereby the filler is utilized as a backing or anvil against which subsequently introduced lead strips bent into the form of rings may be readily calked to produce a fluid-tight joint, which nevertheless has a degree of flexibility found in the ordinary bell and spigot joint and necessary for the successful use of cast iron pipe.

Ordinarily bell and spigot joints are made with a preliminary packing of jute and the bell about the introduced spigot is filled with lead poured therein in a molten state, and which may be afterward calked up tight. The ordinary procedure in the formation of bell and spigot joints in cast iron pipe is wasteful and time consuming requiring the melting of the lead at the trench and the pouring of the lead in the formation of the joint, which operation is often wasteful of lead by the spilling of the latter, and is further wasteful of the lead by oxidization and other losses, while the perfection of the joint is by no means certain.

By the present invention the filler occupies a material portion of the space previously occupied by lead and being made of iron represents but a small fractional portion of the cost of an equal bulk of lead. By producing the lead seal in the form of bars readily bent into ring-shape, it is unnecessary to melt any lead at the trench, and consequently oxidization and spilling losses are avoided, while the formation of the completed joint is greatly facilitated and there

is produced a material saving in time and labor besides providing a much more reliable joint than before.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawings forming part of this specification, with the further understanding that while the drawings show a practical form of the invention, the latter is not confined to any strict conformity with the showing of the drawings, but may be changed and modified so long as such changes and modifications come within the scope of the appended claims.

In the drawings:—

Figure 1 is a longitudinal diametric section of a finished bell and spigot joint embodying the invention.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a plan view of the filler laid out flat.

Fig. 4 is a similar view of one of the lead strips, being the one following the filler into the joint.

Fig. 5 is a similar view of another lead strip introduced into the pipe after the lead strip of Fig. 4.

Fig. 6 is a detail view on a like scale to the preceding figures, showing the meeting ends of the filler and the relation of the lead strips thereto.

Figs. 7 to 13 are longitudinal diametric sections of the pipe joint showing various steps in the production of the joint.

Fig. 14 is a perspective view of an expander utilized in the production of the joint.

Referring to the drawings, there is shown a bell end 1 of a pipe 2 and the spigot end 3 of a pipe 4, the structure following a customary form of bell and spigot cast iron pipe for which the invention is especially adapted. The bell end 1 is provided with the usual lead-receiving groove 5, while the spigot end 3 has the customary terminal bead or shoulder 6.

With the spigot end 3 seated in the bell 1 there is first introduced a quantity 7 of jute or other suitable packing. Sometimes rubber is used in place of the jute packing 7, and this is quite feasible since no hot lead is used in the joint.

Within the bell 1 next to the jute 7 is a filler 8 shown separately in Fig. 3. This

filler comprises a longitudinally extended series of wedge blocks 9 all joined together in edge to edge order at the thin ends by connecting webs 10. These blocks are usually  
 5 formed of iron and the connecting webs 10 are sufficiently flexible to permit the series of blocks constituting the filler to be bent into substantially circular form in surrounding relation to the pipe 4 for introduction  
 10 into the bell 1.

Each wedge block 9 at the end remote from the web 10 is formed with an expanded or dovetail head 11 located at the thick end of the wedge block and one face of this  
 15 head is beveled, as indicated at 12. The wedge blocks may taper slightly from the thin end connected by the webs 10 to the thick end having the dovetail heads 11, but such particular form is not obligatory. The  
 20 strips of filler blocks may be formed by punching malleable strip metal or may be otherwise formed so long as the strips serve the purpose, and may be readily bent into shape if such procedure be the desirable  
 25 mode of applying the filler to the pipe.

Cast or otherwise applied to the thick edge of the filler is a strip 13 of lead having locking tongues 14 partially embracing the  
 30 heads 11. The lead strip 13 adjacent to the filler blocks may be as thick as the filler blocks and adjacent thereto the strip 13 has a tapered portion 15 terminating in a  
 35 tongue 16 at the edge of the strip remote from the filler blocks 9. Furthermore, the tongue 16 is initially slightly rounded, as shown at 17, on one face.

There are also provided two lead strips 18, 19, respectively, these strips tapering slightly in cross-section in the particular  
 40 showing of the drawings, and the strip 18 near one end is provided with a projection 20 extending from the wider edge of the taper strip.

After the introduction of the jute 7, which  
 45 may be firmly packed into the base of the bell 1 about the rib 6, the filler 8 is bent about the pipe 4 and moved into the bell 1, with that portion of the lead strip 13 thinned to provide the tongue 16 outermost.  
 50 The thin edge of the filler 8 is introduced first into the pipe so that the lead strip 13 carried by and forming part of the filler is located at or adjacent to the mouth of the bell 1, the extent of introduction of the  
 55 filler into the pipe being determined by the jute packing 7.

The first step in the production of the joint, namely, the locating of the jute 7, is indicated in Fig. 7, while the next step  
 60 that is, the introduction of the filler, is indicated in Fig. 8. The filler then lies loosely in the bell and is to be expanded so as to be forced into close contact with the inner wall of the bell with the lead ring 13 intima-  
 65 mately engaging the inner wall of the bell

and extending into the lead groove 5. To accomplish this a divided ring 21 is applied to the pipe 4, the ring 21 being longitudinally tapered so as to act in the nature of  
 70 a wedge expander, the taper being on the outer face of the expander. This expander is driven into the bell 1 between the filler 8 and the pipe 4, with the result that the filler is enlarged so that its thick edge is  
 75 moved into the lead groove 5 and the lead ring 13 is forced into close conformation with the lead groove, entering the latter with the tongue 16 extending to about the mouth of the bell 1, in close engagement  
 80 with its inner face. The operation of forcing the filler into engagement with the inner wall of the bell by the expander 21 is shown in Fig. 9. When this operation is completed the filler occupies a position such as  
 85 indicated in Fig. 10, and then another quantity 22 of jute or other suitable packing is calked into the bell between the filler 8 and the pipe 4, as also indicated in Fig. 10.

When the filler is expanded in the pipe that portion adjacent to the mouth of the  
 90 bell is of greater diameter than the portion engaging the jute 7, wherefore the meeting ends of the filler at the part of the filler entering the groove 5 are somewhat separated and more separated than is the case  
 95 with the thin end of the filler deeper in the bell. The result is that the filler when expanded is of more or less conical form, and while the thin end of the filler engages the  
 100 jute 7, the outer face of the filler is in engagement with or close to the inner face of the bell within the groove 5. The seating of the filler against the inner wall of the bell is made more pronounced by calking in  
 105 the jute 22. In order to fill up the space between the separated meeting ends of the filler, care may be taken in applying the jute that the strips of jute are long enough to overlap at such joint, as indicated at 23  
 110 in Fig. 2.

Following the lodging of the packing jute 22 the lead strip 18 is bent about the pipe 4 into ring-shape and moved into the bell between the located lead ring 13 forming  
 115 part of the filler and the pipe 4 with the enlargement 20 so located as to come opposite the space separating the meeting ends of the filler.

Now by means of a suitable calking tool the lead strip 18 now in the form of a lead  
 120 ring is driven tightly into place against the jute packing 22 and against the filler, the extension 20 being forced out to the inner wall of the bell, thus filling in the space left between the meeting ends of the  
 125 lead ring 13 due to the expansion of the filler after introduction into the bell.

Following the lead strip 18 comes the lead strip 19 bent about the pipe 4 into the form of a ring and calked tightly against  
 130

the rings 18 and 13, with the result that the lead at the mouth of the bell is tightly packed thereinto into intimate contact with the inner wall of the bell and the outer wall of the pipe 4. The calking causes a more or less intimate union of the different lead rings so that the lead packing is so far as its function is concerned substantially an integral lead packing throughout and constitutes a more efficient lead packing than is obtained by pouring molten lead into the bell in accordance with the ordinary procedure. The finished joint is indicated in Fig. 1, where the filler 8 and the jute occupy a space within the bell previously occupied by lead and therefore representing a very material saving in lead and a corresponding saving in the cost of the joint due to the high cost of lead and the relatively low cost of the other materials employed even in the manufactured state.

In the assemblage of the joint the amount of labor is far less than is the case where the lead must be melted and poured, while each joint takes but a determinate amount of lead representing only about half as much lead as has heretofore been found necessary in poured joints.

The fillers are readily producible at a factory or foundry and the same is true of the lead strips, since at a foundry or factory large quantities of lead may be melted at one time and the strips formed in large numbers without material waste and far more economically so far as labor is concerned than the joints can be produced by pouring.

Since there is no necessity of melting metal at the trench or ditch, the labor necessary for such operation and the wastage unavoidably incident to such operation are both done away with. The joints are produced with but little more expenditure of time and labor than occurs in calking poured lead joints.

While the lead strips and also the filler have been described as each of a length to about encircle the pipe 4, it will be understood that they may be of shorter lengths, and in the case of the separate lead strips they may be of much less cross-sectional area and a larger number used, but ordinarily the arrangement indicated in the drawings is to be preferred.

The filler has been described as made of iron, but it is to be understood that the term iron is intended to include steel, since the filler may be quite readily rolled out of steel and punched to form the taper blocks with integral connecting webs 10, steel having the necessary flexibility to permit its being bent into circular or conical form. Since the filler is thoroughly protected there is little liability of its becoming rusty in case the pipes are used to carry

water. Should the pipes move out of alignment after being laid, the tendency of the filler is to force the lead packing into more intimate contact with the joined pipes, thus preventing leaks which might occur should 70  
distorting forces move the pipes out of their longitudinal relation. The filler serves as an anvil against which the lead packing may be firmly calked into place, and this in a manner superior to the results obtained 75  
when melted lead is used and subsequently calked, since such melted lead has no solid backing of a nature provided by the filler.

The jute or other similar cushioning packing and the filler constitute a flexible 80  
joint in conjunction with lead, the malleability of which latter contributes to the flexibility of the joint, which flexibility is peculiar to bell and spigot joints as customarily made. 85

What is claimed is:—

1. A bell and spigot pipe joint having a cushioning packing at the inner end of the bell, a series of wedge blocks disposed in the bell about the spigot end of the pipe 90  
with the thin ends of the wedge blocks toward the inner end of the bell, a lead strip anchored to the thicker ends of the series of wedge blocks, cushioning packing between the wedge blocks and the spigot member of the joint, and lead strips lodged in the bell between the spigot member of the joint and the wedge blocks and lead strip 95  
carried thereby, the lead being compressed into intimate contact. 100

2. A bell and spigot pipe joint, comprising cushioning packing, a filler composed of a series of wedge blocks having a lead strip connecting the thicker ends of the blocks, and other lead strips condensed 105  
against the wedge blocks and the first-named lead strip within the bell member of the joint.

3. A bell and spigot pipe joint having cushioning packing at the inner end of the 110  
bell, a series of wedge blocks disposed in the bell about the spigot end of the pipe with the thin edges of the wedges toward the inner end of the bell and the thicker ends of the wedges beveled, a lead strip 115  
anchored to the thicker ends of the wedges and carried thereby, cushioning packing between the wedge blocks and the spigot member of the pipe joint, and lead strips between the spigot member of the pipe and 120  
the first-named lead strip and wedge blocks and compressed into intimate contact with each other and with the portions of the pipe engaged by the lead.

4. Filling means for the joints of bell and 125  
spigot pipes, comprising a series of spaced wedge blocks integrally connected together at their thin ends, and having a lead strip connecting the thicker ends of the wedge blocks together, and other lead strips for 130

association with the first-named lead strip in the joint.

5. Filling means for the joints of bell and spigot pipes, comprising a series of spaced wedge blocks integrally connected together at their thin ends, and having a lead strip connecting the thicker ends of the wedge blocks together, and other lead strips for association with the first-named lead strip in the joint, one of the lead strips having a portion projecting from one edge to enter between the meeting ends of the series of blocks when in place in the joint.

6. Filling means for joints of pipes, comprising a series of blocks introducible into the bell end of the pipe about the spigot end after the latter is applied to the bell end, said series of blocks constituting an anvil for sealing material and the blocks being of a thickness to permit the series to be lodged in the bell end of the pipe with the blocks each tapering toward one end and beveled at the thicker end.

7. A filler for joints of bell and spigot pipe, comprising a series of wedge blocks introducible into the packing space to constitute an anvil for sealing material, each wedge block having its thicker end beveled longitudinally of the block.

8. A filler for joints of bell and spigot pipe, comprising a series of wedge blocks introducible into the packing space to constitute an anvil for sealing material, each wedge block having its thicker end beveled longitudinally of the block and also extended toward neighboring blocks.

9. A filler for joints of bell and spigot pipe comprising a flexible series of connected wedge blocks introducible into the packing space to constitute an anvil or backing for sealing material, and said filler having a lead strip extending along and fixed to the thick ends of the wedge blocks.

10. A filler for joints of bell and spigot pipe, comprising a flexible series of connected wedge blocks introducible into the packing space to constitute an anvil or backing for sealing material, and said filler having a lead strip extending along and fixed to the thicker ends of the wedge blocks, said strip having a longitudinally extended tongue along the edge thereof remote from the wedge blocks.

11. A filler for joints of bell and spigot pipe comprising a series of blocks each tapering from one end toward the other with the blocks flexibly connected together at the thinner ends and the thick ends being beveled longitudinally of the blocks and widened in the direction of the length of the series.

12. A filler for joints of bell and spigot pipe comprising a series of blocks each tapering from one end toward the other with the blocks flexibly connected together at the thinner ends and the thick ends being

beveled longitudinally of the blocks and widened in the direction of the length of the series, said filler also including a longitudinally extended lead strip anchored to the thick ends of the blocks about the beveled and widened portions thereof.

13. A filler for joints of bell and spigot pipe comprising a series of blocks each tapering from one end toward the other with the blocks flexibly connected together at the thinner ends and the thick ends being beveled longitudinally of the blocks and widened in the direction of the length of the series, said filler also including a longitudinally extended lead strip anchored to the thick ends of the blocks about the beveled and widened portions thereof, and said lead strip being thinned into a longitudinally extended tongue along the edge remote from the wedge blocks.

14. A filler for the joints of bell and spigot pipe, comprising a strip of metal tapering from one edge toward the other edge and divided into a series of blocks by slots extending entirely through the strip from face to face and extending from the thick edge of the strip toward and stopping short of the thin edge of the strip to provide at the thin edge an integral flexible connection for the blocks of the series.

15. A filler for the joints of bell and spigot pipe, comprising a strip of metal tapering from one edge toward the other edge and divided into a series of blocks by slots extending entirely through the strip from face to face and extending from the thick edge toward and stopping short of the thin edge to provide an integral flexible connection for the blocks at the thin edge of the strip, each block at the thick edge being extended toward the neighboring blocks in the direction of the length of the strip.

16. A filler for the joints of bell and spigot pipe comprising a strip of metal tapering from one edge toward the other and divided into a series of sections by slots extending through the thick edge toward and stopping short of the thin edge to provide an integral flexible connection at the thin edge, each block at the thick edge being extended toward the neighboring blocks in the direction of the length of the strip, and a strip of lead anchored to the thick edge of the strip in the slots and extending away from the first-named strip in the direction of the width thereof.

17. A filler for the joints of bell and spigot pipe comprising a strip of metal tapering from one edge toward the other and divided into a series of sections by slots extending through the thick edge toward and stopping short of the thin edge to provide an integral flexible connection at the thin edge, each block at the thick edge being extended toward the neighboring blocks in

the direction of the length of the strip, and  
a strip of lead anchored to the thick edge of  
the strip in the slots and extending away  
from the first-named strip in the direction  
5 of the width thereof, said lead strip being  
thinned along the edge remote from the first-  
named strip to provide a longitudinally ex-  
tended tongue.

In testimony, that I claim the foregoing  
as my own, I have hereto affixed my signa- 10  
ture in the presence of two witnesses.

JAMES R. McWANE.

Witnesses:

E. W. HERRMANN,  
C. W. HENRY.