May 19, 1942.

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2,283,179

SOILPIPE HUB CLAMP

Filed Aug. 14, 1940

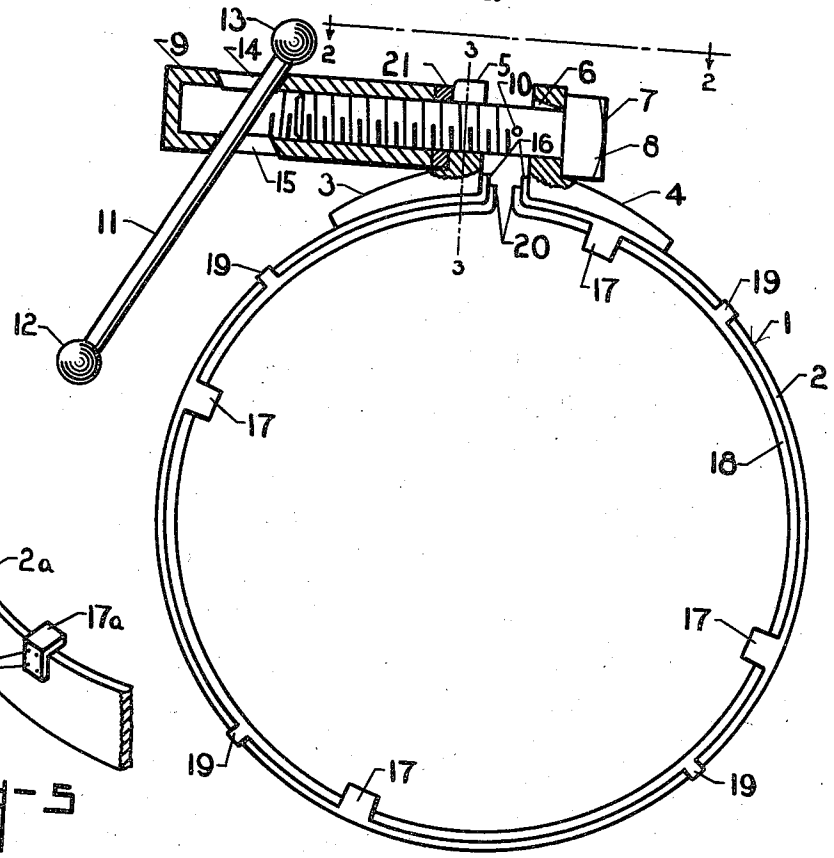


FIG-1

FIG-5

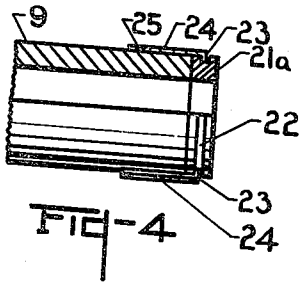


FIG-4

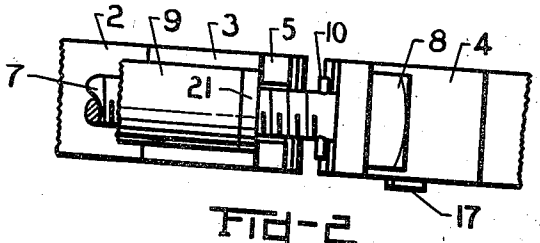


FIG-2

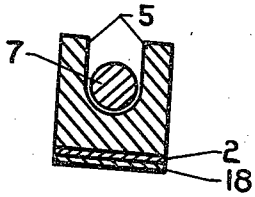


FIG-3

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Patented May 19, 1942 2,283,179

UNITED STATES PATENT OFFICE

2,283,179

SOIL PIPE HUB CLAMP

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Application August 14, 1940, Serial No. 352,644

8 Claims. (Cl. 24—19)

The present invention relates broadly to clamping devices, and in particular to an adjustable calking hub strap for use on soil pipe.

Soil pipe, which is commonly made of cast iron, comes in lengths having a bell or hub at one end, while the rest of the pipe is substantially of uniform smaller outside diameter terminating in a spigot adapted to loosely fit into the hub end of a like piece of soil pipe. In assembling sections of soil pipe, it is standard practice to seal the joint in the hub with molten lead, and then after the lead has cooled and contracted, the exposed end of same is normally tamped with suitable tamping tools which are pounded with a hammer. This tamping of the lead places localized severe stresses and strains in an outward radial direction on the hub during the tamping period. Under such conditions, the strain caused by this tamping of the calking lead not infrequently causes the hub to crack. Where this occurs, it is necessary to replace the whole section of soil pipe if same is to meet the requirements for a sanitary and properly constructed job. The replacement of a section of soil pipe under these conditions is not only expensive from the standpoint of material used, but also from the labor standpoint. Such replacement is also especially difficult where a soil pipe has been laid for a considerable distance, and then one of the hubs broken at a point several lengths from the end of the line. With these problems and difficulties in mind, I have devised a mechanism which may be removably clamped around the hub of a soil pipe so as to reinforce same against cracking under tamping conditions.

Accordingly, among the objects of the present invention is the provision of an adjustable size clamping assembly.

Another object is to provide a clamping hub strap assembly adapted to provide a continuous radial grip around the circumference of the hub of a soil pipe, or the like.

A further object is to provide a calking hub strap assembly which has ear means along one edge for holding the mechanism against endwise slippage on the soil pipe hub.

A further object is to provide a calking hub strap assembly which has a pair of nesting flexible metal straps, the inner one of which is removable for adjustment purposes.

A further object is to provide a calking hub strap assembly, the encircling portion of which is easily disengaged at one end for slipping around a soil pipe, and reengagement ready for tightening in place by means of a suitable wrench and threaded member.

A still further object is to provide a simple and compact calking hub strap assembly which can be manufactured at low cost, and is easy to use even in rather confined quarters.

Still further objects and advantages of the present invention will appear as the following description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims, the annexed drawing and the following description setting forth in detail certain means for carrying out the invention, such disclosed means illustrating, however, but several of various ways in which the principle of the invention may be used.

In said annexed drawing:

Figure 1 shows a partially sectioned assembly view of a preferred form of the present invention.

Figure 2 is a top view of the connecting portion of the mechanism as viewed in the direction of the arrows 2—2 of Figure 1.

Figure 3 is a section view taken along the line 3—3 of Figure 1.

Figure 4 is a partially sectioned fragmentary enlarged assembly view showing one type of construction for removably fastening a thrust washer on the end of a wrench member useable in connection with the assembly shown in Figure 1.

Figure 5 shows a modified form of mounting ears on the outer flexible steel strap of the assembly shown in Figure 1.

Referring more particularly to Figure 1 of the drawing, the clamping assembly 1 has a flexible strap 2, preferably made of steel. Mounted on the ends of this strap are a pair of ears 3 and 4, the first of which is preferably provided with a fork top 5, while the second has an opening 6 therethrough adapted to receive a suitable metal cap screw 7, or the like. The head 8 of this cap screw is preferably rectangular or of other shape adapted to hold same against rotation during the tightening or loosening of the assembly, and the rectangular head shown in side and top views in Figures 1 and 2 is intended to diagrammatically illustrate the various equivalent forms of this element. In order to prevent cap screw 7 from working out of place, it is preferably cross drilled and provided with an extending pin 10, which allows a limited amount of endwise movement of cap screw 7. Opening 6 may be enlarged at its upper edge, as shown in Figure 1, so as to permit cap screw 7 to have its free end tilted

upward to facilitate engagement and disengagement of the assembly. The fork top of ear 3 also cooperates in facilitating assembly and disassembly of the mechanism.

Wrench 9 may be of various forms of construction without departing from the scope and spirit of my present invention. However, I prefer to use this member in the form shown in Figure 1. The wrench is preferably proivded with a bar operating member 11 having enlarged ends 12 and 13. Openings 14 and 15 in wrench 9, and through which bar 11 slidably fits, are preferably chamfered at their ends so that bar 11 will have a relatively wide angle of swinging for ease of use, and yet will not be marred by sharp edges of openings 14 and 15.

The ears 3 and 4 may be welded, riveted, or otherwise fastened to flexible strap 2, and for additional support, the latter may have its free ends 16 bent upward to form abutting shoulders as shown. Flexible strap 2 is also preferably provided with inwardly extending ears 17 which are adapted to bear against the end of a soil pipe hub, and prevent the assembly from slipping down the hub to a point where the clamping action attainable through the use of this tool is less effective.

In order to take care of variations in diameter of soil pipe hubs for a single size of pipe, I prefer to mount a removable flexible metal strap 18 inside of flexible metal strap 2. In order to hold this inner flexible strap in place, I prefer to provide same with outwardly extending ears 19 which cooperate with inwardly extending ears 17 on flexible strap 2 for preventing undesirable axial movement of one flexible strap on the other. In order to substantially prevent rotation of one strap within the other, I prefer to bend the free ends 20 of flexible strap 18 outward, as shown in Figure 1. This type of assembly makes possible the ready conversion of the tool from use on the standard soil pipe to extra heavy soil pipe, and, vice versa, without greatly varying the width of the open strip between the ends of the flexible strap in contact with the pipe being gripped. By keeping the width of this strip narrow, cracking of the soil pipe hub at this point under calking pressure is reduced to a minimum.

In order to reduce wear of the end of wrench 9 on the fork top of ear 3, a suitable thrust washer 21, preferably of metal, may be mounted therebetween. This washer may be of plain construction as shown in Figure 1, or it may be removably fastened on the end of wrench 9 as shown in Figure 4. In this latter type of construction, washer 21*a* is provided with a groove 22 into which the inturned ends 23 of spring latch member 24 engage. These members may be fastened to wrench 9 in conventional manner, for instance, as by spot welding at 25. Washer 21*a* with this type of construction is held on the end of wrench 9, and yet is freely rotatable on the end of same. This anchoring of the washer is of definite aid in holding the washer in place when the assembly has been placed around a soil pipe, and ear 3 is being reengaged with cap screw 7 and wrench 9.

In Figure 1, the inwardly extending ears 17 are illustrated as integral parts of flexible strap 2. This construction, however, may be modified in various ways, and one such variation is shown in Figure 5 where ears 17*a* are separately formed and fastened to flexible strap 2*a* by means of spot welding 26 or the equivalent.

The use of the mechanism, which is not specifically limited to soil pipe hubs, is as follows: Wrench 9 is rotated to loosen same on cap screw 7, whereupon the wrench and cap screw are tilted upward at the outer end as permitted by the cut away upper inner edge of opening 6 of ear 4. The fork top 5 of ear 3 is then forced downward to disengage same from cap screw 7 and wrench 9. This leaves a free opening between the ends of the flexible strap so that same may be slipped around a soil pipe or the like, either above or below the hub thereof. Forked end 5 of ear 3 is then forced back into engagement with cap screw 7 and wrench 9, following which the assembly is slid along the soil pipe until inturned ears 17 of flexible strap 2 come in contact with the end of the soil pipe hub. Wrench 9 is then rotated to tighten the assembly and grip the outer circumference of the soil pipe hub in a continuous tight embrace. This gives support to the soil pipe hub so that molten lead which has been poured thereinto and solidified may be tamped in place to tighten and seal the joint without danger of cracking the soil pipe hub. At the end of the tamping action, wrench 9 is loosened, the assembly slid off of the hub, and removed from around the soil pipe so that it is then ready for use on the next hub to be tamped.

Other modes of applying the principle of my invention may be employed instead of those explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A device of the class described, which comprises a two ended flexible strap member, outwardly projecting ears mounted on the ends of said strap member, said ears being in close proximity for moving to and from each other, an elongated threaded member, one of said ears having a hole therethrough for said threaded member, means for anchoring said threaded member against completely pulling through said hole, a fork top on the other of said ears for ready engagement and disengagement with said threaded member, means threadedly engaging the free end of said threaded member, for moving said ears relative to each other, a thrust washer on the end of said last named means and between same and the forked top ear, and means for holding said washer on the end of said means which threadedly engages the free end of said threaded member.

2. A device of the class described, which comprises a two ended flexible metal strap member, outwardly projecting metal ears mounted on the ends of said strap member, said ears being in close proximity for moving to and from each other, an elongated threaded member, one of said ears having a hole therethrough for said threaded member, means for anchoring said threaded member against completely pulling through said hole, the other of said ears having a fork top for ready engagement and disengagement of said threaded member, a wrench threadedly engaging the free end of said threaded member at the face of said fork top ear at the side thereof opposite to the space between said ears, for moving said ears relative to each other, and means for operating said wrench.

3. In a clamping member, the combination of

a two ended flexible strap member, outwardly projecting ears mounted on the ends of said strap member, means for adjustably joining said ears in spaced relation, means for disengaging said joining means from one of said ears, and a plurality of inwardly extending ears on one edge of said flexible strap member.

4. In a clamping member, the combination of a two ended flexible strap member, outwardly projecting ears mounted on the ends of said strap member, said ears being in close proximity for moving to and from each other, an elongated threaded member, one of said ears having a hole therethrough for said threaded member, means for anchoring said threaded member against completely pulling through said hole, a fork top on the other of said ears for ready engagement and disengagement with said threaded member, means threadedly engaging the free end of said threaded member, for moving said ears relative to each other, and a plurality of inwardly extending, relatively small, ears on one edge of said flexible strap member.

5. In a clamping member, the combination of a two ended flexible strap member, outwardly projecting ears mounted on the ends of said strap member, said ears being in close proximity for moving to and from each other, an elongated threaded member, one of said ears having a hole therethrough for said threaded member, means for anchoring said threaded member against completely pulling through said hole, a fork top on the other of said ears for ready engagement and disengagement with said threaded member, means threadedly engaging the free end of said threaded member, for moving said ears relative to each other, inwardly extending, relatively small, ears on one edge of said flexible strap member, said hole through said outwardly projecting ear being upwardly flared to permit limited upward pivotal movement of the free end of said elongated threaded member, and means for loosely anchoring said elongated threaded member to said ear having the upwardly flared hole for relatively short endwise movement therethrough.

6. In a clamping member, the combination of a two ended flexible strap member, outwardly projecting ears mounted on the ends of said strap member, a second two ended flexible strap member nested within the first, means for holding said strap members in nested position, and means for adjustably joining said ears in spaced relation.

7. In a clamping member, the combination of a two ended flexible strap member, outwardly projecting ears mounted on the ends of said strap member, a second two ended flexible strap member nested within the first, means for holding said strap members in nested position, means for adjustably joining said ears in spaced relation, means for disengaging said joining means from one of said ears, and inwardly extending ears on one edge of said outer flexible strap member.

8. A clamping member, which consists of a two ended flexible steel strap member bent to substantially circular form, an outwardly projecting ear mounted on each end of said strap member, said ears being in close proximity for moving to and from each other, an elongated threaded metal cap screw, one of said ears having a hole therethrough for said cap screw, head means on said cap screw for holding the latter against rotation while preventing same from completely passing through said hole, pin means cooperating with said cap screw head for permitting limited endwise movement of said cap screw, said hole through said outwardly projecting ear being upwardly flared to permit upward pivotal movement of the free end of said cap screw, a fork top on the other of said ears for ready engagement and disengagement with said cap screw, a wrench threadedly engaging the free end of said cap screw for moving said ears relative to each other, a thrust washer between the end of said wrench and said fork top ear, and inwardly extending ears on one edge of said flexible strap member.

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