

(No Model.)

A. N. RANKIN.

COLD PACKED PIPE JOINT AND METHOD OF PRODUCING THE SAME.

No. 347,060.

Patented Aug. 10, 1886.

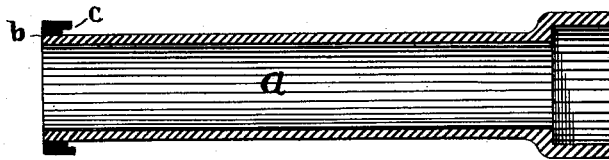


Fig. 1.

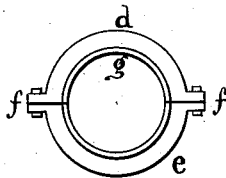


Fig. 2.



Fig. 3.

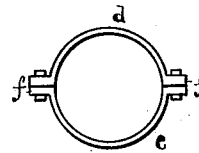


Fig. 4.

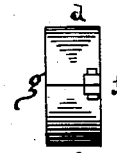


Fig. 5.

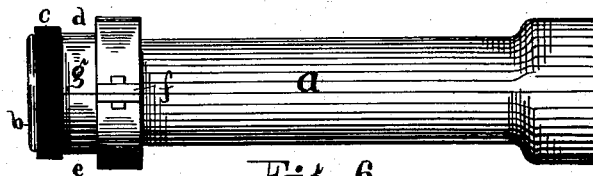


Fig. 6.

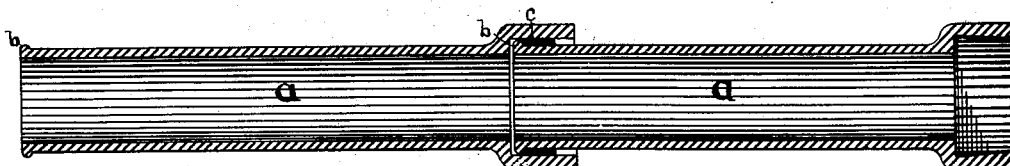


Fig. 7.

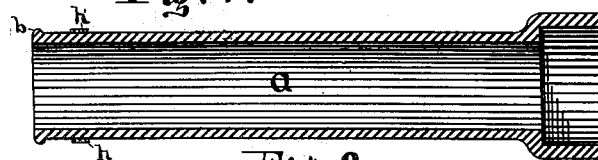


Fig. 8.

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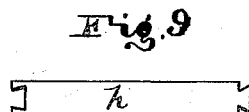


Fig. 9.

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COLD-PACKED PIPE-JOINT AND METHOD OF PRODUCING THE SAME.

SPECIFICATION forming part of Letters Patent No. 347,060, dated August 10, 1886.

Application filed May 15, 1884. Serial No. 131,649. (No model.)

To all whom it may concern:

Be it known that I, ANDREW NERVA RANKIN, a citizen of the United States of America, and a resident of the village of Jamaica, in the county of Queens and State of New York, have invented certain new and useful Improvements in Cold-Packed Pipe-Joints and Method of Producing the Same, of which the following specification is a full, clear, and exact description.

My invention relates to pipe-joints and to the art of producing the same, and its object is to provide a substantial and economical means of uniting sections of ordinary metal pipe one to another, and also a reliable method of effecting the same.

The features of novelty for which I desire protection in this instance are pointed out in the claims at the end of this description.

In the accompanying drawings, which form a part of this specification, and in which like features are indicated by like letters, Figure 1 is a longitudinal sectional view of a section of ordinary cast-iron pipe. Fig. 2 is an end view, and Fig. 3 a side view, of the detachable collar used in perfecting the joint. Figs. 4 and 5 are similar views of a modification of the collar. Fig. 6 is a side elevation of a section of pipe, showing the collar in position with its side extension in contact with the soft-metal packing-band. Fig. 7 is a longitudinal sectional view of two sections of pipe, showing the appearance of my joint when perfected. Fig. 8 is a longitudinal sectional view of a section of pipe, showing special features hereinafter described; and Fig. 9 is a plan view of the wrought-iron band with dovetail recess and dovetail tongue.

My present invention is intended to be applied to pipe having a smooth exterior surface as contradistinguished from pipe having its body grooved or recessed, and it contemplates the employment of sections of pipe provided at one end with an enlarged mouth or socket having straight or parallel interior walls, or walls increasing in size from the mouth to the base, but in no case decreasing or tapering from the mouth to the base of said socket, (see the unused socket of Fig. 7,) while the other end is of the same general diameter as the body of the pipe, and may or may not have a bead at its extreme end, and

is commonly termed the "spigot" end. The usual method of forming the joint between two such sections of pipe, after the spigot end of one section has been inserted into the socket of the companion section, is to force in a slight packing of hemp or the like to prevent the molten lead from running into the interior of the pipe, a suitable band being used at the mouth of the socket to prevent the molten lead from running to waste, and the molten lead is then poured into the space between the spigot end and socket until said space is filled. Then to perfect the joint a calking-iron and hammer are employed, the effect of which operation is to crystallize the lead, and consequently weaken the packing.

Molten lead in cooling uniformly shrinks toward its center, so that, according to this law, the lead packing, when applied in a molten state in the manner described, does not adhere to the inner walls of the socket, but hugs the spigot end, and hence the necessity for the use of the calking-iron; but, aside from the deleterious effect upon the packing by the use of the calking-iron, the calking operation produces but a very slight contact of the body of the lead packing with the interior of the socket, usually just around its mouth. The result is that when such a joint is deflected from any cause in any direction the lead, having lost its elasticity from being crystallized under the action of the calking-iron, will readily separate from contact with the mouth of the socket, and thus cause the joint to leak. A more serious objection to this style of joint is found in the fact that the deflecting of the pipe after the formation of the joints often results in the breaking of the enlarged mouths or sockets, which causes very serious damage.

By my invention I propose to overcome the above-mentioned objections.

In carrying out my invention I mold a band of lead or other suitable soft metal or composition *c* around the pipe *a* at or near its spigot end, as shown in Fig. 1 of the drawings. To accomplish this I make use of a mold of the required shape, which is constructed in such a way that a portion of the rear end of the band—say about one-third of its width—will not adhere to the pipe. The reason for this will be presently explained. After the mold is filled with lead or other suitable soft metal

in a molten or fluid or semi-fluid state, sufficient time is allowed the metal to harden before removing the mold. In the process of hardening, as already explained, the soft metal shrinks toward its own center, and thus effects a permanent positive union between the band *c* and pipe *a*, except at the rear end of the band, where the mold has prevented contact between the band and pipe.

In the construction shown in Figs. 1, 6, and 7 the packing-band *c* is straight or untapered, and its diameter is a little smaller than the bore of the socket of the companion section of pipe, while its breadth is just sufficient to accomplish its work, but leaving a space or air-chamber behind it, as shown in Fig. 7. The pipe *a* is shown provided with the usual bead, *b*, at its spigot end; but the presence or absence of this feature is not material to the success of my invention.

My method of perfecting the joint between two sections of pipe of the character described is as follows: The spigot end of one section, provided with the soft-metal packing-band *c*, is inserted into the socket of a companion section, and the detachable collar *d e*, (shown in Figs. 2 and 3,) constructed with a side extension, *g*, whose diameter or cross-section is a little less than that of the bore of the socket of the companion section of pipe, is placed in position around the spigot end, so that the front edge of such side extension *g* will bear against the packing-band *c*, as shown in Fig. 6. If found more convenient, the collar *d e* may be placed upon the spigot end of the pipe before the said end has been inserted into the socket of the companion section of pipe. And to insure the proper centering of the spigot end in the socket, I may make use of one or more set-screws passing through the side of the collar and operating in a well-known manner to center the spigot in the socket. When the parts are properly adjusted, a hydraulic jacking device of suitable construction is applied to exert pressure upon the back of the collar *d e*, with the effect of upsetting the rear end of the soft-metal packing-band and forcing it in close contact with the wall of the socket by friction. This produces a dovetail joint when the socket increases in diameter from its mouth toward its base. After the joint has been thus perfected the collar is removed.

It will be seen that by the use of the collar with its side extension a pressure upon and around the whole circle of the packing-band *c* is obtained simultaneously, and that the crystallization and consequent weakening of the packing as induced by the use of a calking-iron and hammer are entirely obviated.

My joint, when made according to the method above explained, will present the appearance shown in Fig. 7. It will be observed that back of the packing-band *c*, within the socket, in this view of the perfected joint, there is a vacant space, the object of which is to permit the pipe to deflect in any direction

to considerable extent without liability of the body of the pipe coming in contact with the edges of the mouth of the socket. It is thus I avoid a serious objection to the commonly-employed joint, since, as usually made with the calking-iron and hammer, the lead fills up entirely the mouth of the socket and permits no deflection of the pipe without loosening the packing, and oftentimes breaking the socket.

The detachable side-extension collar, *d e*, is preferably made in two parts, as shown, and provided with flanges *f*, whereby it may be readily attached to or detached from the pipe. It may, however, be made in more than two parts, or it may be made in one continuous flexible piece. The side extension, *g*, of the collar *d e* may also be made in a number of pieces, so as to have thicker and thinner plates in emergencies.

The modification of the detachable collar *d e* shown in Figs. 4 and 5 needs no special explanation, its distinguishing feature consisting in making the side extension, *g*, of the same diameter as the rest of the collar, the diameter of the whole being a little less than the diameter of the bore of the socket of the pipe.

When the sides of the socket are parallel, instead of making use of the collar with side extension in the manner specified, the required lateral support to the packing-band *c* may be supplied by a bead or band, *h*, formed around the exterior of the spigot end of the pipe, as shown in Fig. 8. This band may constitute an integral portion of the body of the pipe, or it may consist of a ring of wrought-iron separately made and shrunk upon the pipe. If the pipe happens to be without the bead *b*, usually formed at its extremity, the ring intended to form the bead *h* may be made, and while expanded with heat applied in the required position upon the surface of the pipe's spigot, and allowed to fasten itself there by shrinking; or, if the pipe has the bead *b* at its extremity, I employ to form the required band at *h* a strap of wrought-iron, on one end of which there is formed a dovetail recess and at the other end a corresponding dovetail tongue, which strap, having been made sufficiently hot, is bent around the pipe's spigot at the desired location and the dovetails interlocked.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The method of forming a pipe joint, which consists in casting a band of soft metal of equal diameter throughout its circumference on the spigot end of a metal pipe, then inserting said pipe into a companion section having a bell-mouth, and finally upsetting the packing-band so as to make it adapt itself to the walls of the socket, substantially as described.

2. A metal pipe the surface of which is smooth, having permanently secured upon its spigot end a packing-band of lead or other suitable soft metal, the outer circumference of which is of equal diameter throughout its

breadth, in combination with a socket or bell the inner walls of which are inclined, substantially as described.

3. A metal pipe the surface of which is
5 smooth, having a packing-band of lead or other suitable soft metal, which for about two-thirds of its breadth is permanently secured upon the spigot end, substantially as described.

4. A detachable upsetting device for use in

perfecting the herein-described cold-packed 10 pipe-joint, consisting of a sectional collar having side extensions, *g*, substantially as described.

ANDREW NERVA RANKIN.

Witnesses:

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