

No. 660,525.

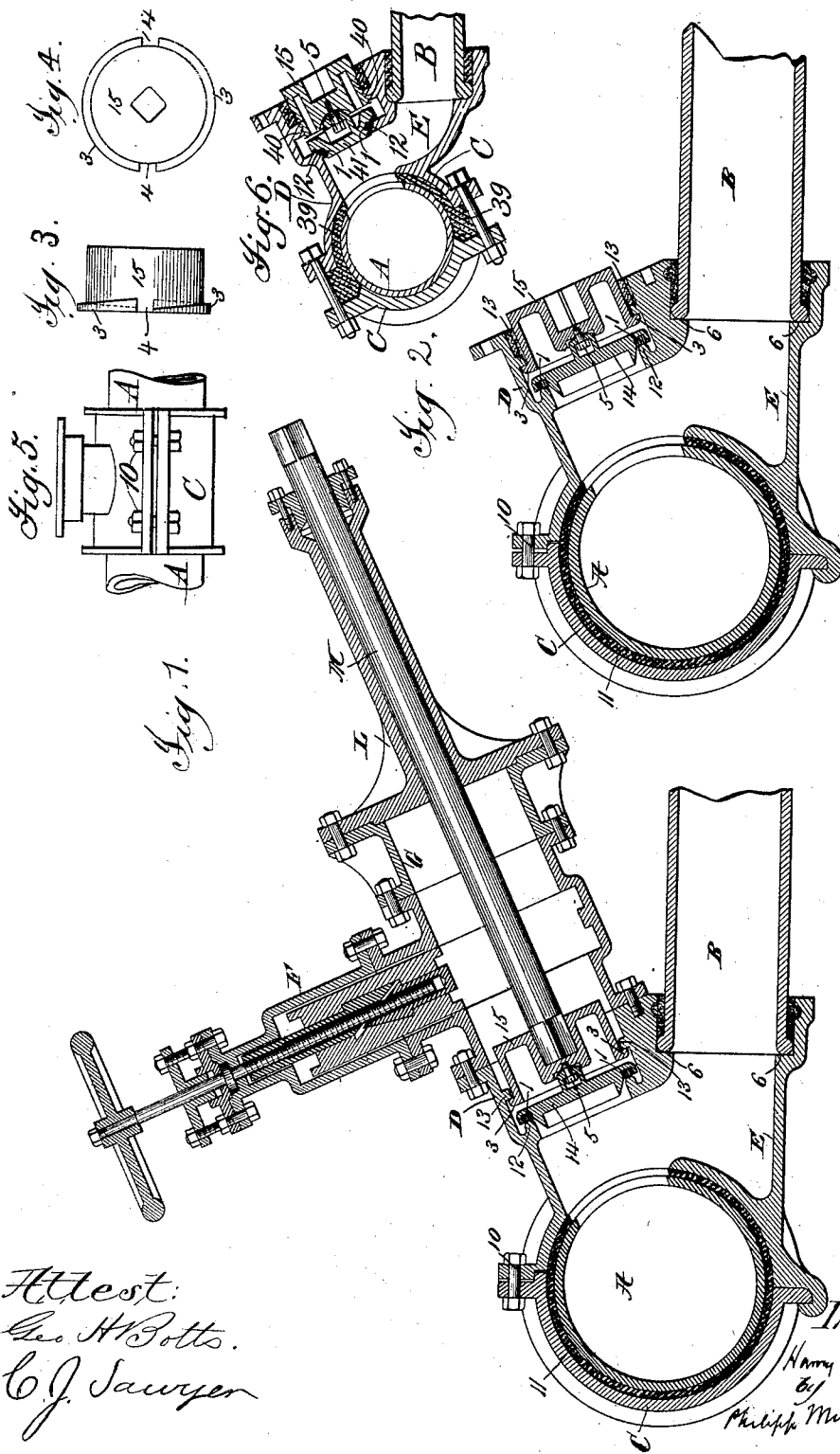
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H. H. BURRITT.

METHOD OF AND MEANS FOR FORMING BRANCH CONNECTIONS WITH WATER MAINS.

(Application filed Feb. 12, 1892.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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METHOD OF AND MEANS FOR FORMING BRANCH CONNECTIONS WITH WATER-MAINS.

SPECIFICATION forming part of Letters Patent No. 660,525, dated October 23, 1900.

Application filed February 12, 1892. Serial No. 421,200. (No model.)

To all whom it may concern:

Be it known that I, HARVEY H. BURRITT, a citizen of the United States, residing at Belleville, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Branch Connections with Water-Mains and Means for Forming the Same, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of the present invention is to provide improved means for forming branch connections with water-mains.

In carrying out my invention I provide a sectional sleeve formed in two parts, so as to be clamped upon the main, the sectional sleeve employed being of peculiar construction in that it is provided with a hub formed integral therewith, said hub consisting of a short pipe adapted to support a gate-valve and also support a tapping-machine by which the main is tapped, said sectional sleeve, furthermore, being preferably of such construction as to adapt it to cooperate with an improved plug forming a part of my invention and a branch opening at an angle to said short pipe and in which the branch connection is made.

The tapping-machine for tapping the main used with the sectional sleeve above referred to may be of any suitable construction.

As a full understanding of the invention can best be given by an illustration and a detailed description of an organization embodying the same, such description will now be given, reference being had to the accompanying drawings, in which—

Figure 1 shows a main provided with a sectional sleeve and the latter with a plug embodying the improvements constituting the present invention, said view also illustrating the gate-valve in its open position and the means for seating the plug. Fig. 2 is a view similar to Fig. 1 with the gate-valve and the means for seating the plug disconnected from the sleeve, or, in other words, the completed permanent construction of main and branch. Figs. 3 and 4 are details of the plug shown in Figs. 1 and 2. Fig. 5 is a plan view, on a

reduced scale, of the main and sectional sleeve. Fig. 6 shows a construction employing a sectional sleeve and plug of modified form.

Referring now to Figs. 1 to 5 of said drawings, A is the main with which the branch pipe B is to be connected. C is a sectional sleeve consisting of two parts hinged together on one side and united by bolts 10, although it will be understood that the parts of this sleeve may be bolted together on both sides of the main, if preferred, or other constructions used. A packing 11 is preferably placed about the main and the sectional sleeve C clamped tightly upon it, as usual, so as to prevent leakage about the sleeve.

The sectional sleeve C is constructed, as shown, so as to permit suitable packing to be used and so as to make an absolutely-tight joint under the heavy pressure of the main. The sleeve in the construction shown in Figs. 1 to 5 is of the same width throughout and formed so as to permit packing entirely about the main, and this construction is preferred, especially with large branches, as the main is thus strengthened at the branch. It will be understood, however, that this is not absolutely necessary, but that the sectional sleeve may be constructed for packing only partially about the main, as in the construction shown in Fig. 6.

The sleeve C is provided with a hub on one side, preferably formed integral therewith, as shown, this hub consisting of a short straight pipe D, opening directly from the main and through which the main is tapped by any suitable tapping-machine, and a branch E, opening at an angle to the straight pipe D and forming the connection with the branch pipe B. The straight pipe D may be constructed in any suitable manner to support a gate-valve during the operation of tapping and plugging and so as to be plugged for permanently closing the pipe after the branch connection has been formed. I prefer, however, to use the construction shown, in which the pipe D is flanged at its outer end, so that a flanged gate-valve may be bolted thereto, and I have devised a novel

construction of the outer end of the pipe and a plug for use therewith, which are the preferred constructions and in themselves form parts of my invention. In this preferred construction the pipe D is enlarged at its outer end and constructed to form a shoulder 12, extending about the interior of the pipe some distance inside the outer end, and outside this shoulder 12 the pipe is constructed to coact with a plug so constructed that a tight joint may be formed by rotating the plug, as hereinafter described. In the construction shown in Figs. 1 and 2 the pipe is provided for this purpose with lugs or projections 13. The plug used in connection with this construction consists of a disk 14 of metal, forming the head of the plug and having set therein a ring of rubber, lead, or similar yielding material 1, which rests upon the shoulder 12 when the plug is inserted, so that as the plug is forced inward a close joint is formed between the ring of yielding material and shoulder. The plug is provided also with a cap 15, which has an angular head or recess for the purpose of receiving the plugging-tool and is provided at its inner end with a flange forming a rim 3, which is cut away on opposite sides at 4, so as to permit the rim to be passed inside the lugs 13, and the rim 3 is provided with inclined surfaces which engage the lugs after the plug has been placed in position and rotated, so as to form a spiral cam of very slight pitch. By means of these spiral cam-surfaces, therefore, the turning of the plug 15 after the rim 3 has been passed inside the lugs 13 serves to drive the plug inward and force the rubber or lead ring 1 hard down upon the shoulder 12. The head 14 is preferably secured to the cap 15 in such a manner that the latter may turn independently of the former. Any suitable construction may be used for this purpose; but the connection will preferably be pivotal, so as to allow free movement of the cap and plug independently of each other, except that the plug is driven inward by the rotation of the cap, as above described, the perfect seating of the head 14 on the shoulder 12 being thus assured. In the construction shown this connection is formed by a small bolt 5, tapped through a cap in the head 14 and into the screw-cap 15. It will be evident that by this construction a tight joint is formed by the head 14 as the plug is screwed in and that the plug is held against the main pressure by means of the cam construction of rim 3 and lugs 13. The cap 15 also is of smaller size outside the rim than the pipe D, thus affording space for packing the pipe after the connection is made and the gate-valve removed, a perfectly tight and strong permanent construction thus being produced, as shown in Fig. 3.

The branch E may be of any suitable construction for the purpose of receiving a branch pipe and forming a tight joint therewith. As shown it is enlarged at the outer end, so as to form a shoulder 6, against which

the inner end of the pipe B rests; and the branch and branch pipe are preferably provided, respectively, with a groove and rib, as shown, so that the branch pipe is held firmly in position by the packing, as shown in Figs. 1 and 2 and as is common in such constructions.

The gate-valve may be of any suitable construction adapted to be secured to the pipe D and to support tapping and plugging devices for tapping and plugging the main. A common gate-valve F is shown, provided with flanges at each end for securing it to the pipe D and to a short pipe G, forming a chamber outside the gate-valve, into which the tap is drawn for closing the gate-valve before the tapping-machine is removed, although it will be understood that this short pipe G may be omitted and the chamber formed by a special construction of the gate-valve with an extension at this end.

In the drawings no tapping-machine is shown; but it will be understood that any suitable form of tapping-machine may be used for tapping the main and that prior to such tapping operation the tapping-machine will be connected to the flange of the pipe G.

The operation of forming the branch connection with the main by my improved means is as follows: The sectional sleeve C is secured upon the main and tightly packed, so as to prevent all leakage, the sections being tightly drawn together by the bolts 10 after the packing has set, and the branch pipe B is connected with the branch E and the joint packed. The gate-valve F is then secured to the straight pipe D and the tapping-machine mounted on the gate-valve. The gate-valve being open, as shown in Fig. 1, the drill and cutter employed in such tapping-machines are run in and an opening is drilled in the main by the drill. The drill and cutter are then withdrawn into the chamber G beyond the gate-valve F, which is then closed. The pressure in the main A now being transferred to the branch connections, the joints in these and between the sectional sleeve C and the main are tested. If any leak is found, the tapping-machine is removed and a screw-plug substituted for the drill carried thereby, the tapping-machine being then replaced and the screw-plug run in to plug the opening cut in the main by the drill. The sectional sleeve C may then be removed from the main and repacked or other joints packed wherever required and this testing operation be repeated, if necessary, until perfectly-tight joints are obtained. When no leakage is found on testing, the cutter of the tapping-machine is again run in through the open gate-valve and a piece cut from the main thereby, as shown in Fig. 1, this piece being removed with the cutter. The cutter having been withdrawn into the chamber G, the gate-valve F is closed and the tapping-machine removed. The plugging-machine is then substituted therefor, this plugging-machine in the form

shown consisting of the flanged cylinder L, adapted to be secured to the pipe G and having the plugging-spindle M mounted therein, this spindle consisting of a plain shaft provided at opposite ends with angular portions, the outer of which is adapted to receive a wrench outside the cylinder L and the other to enter the angular opening in cap 15 of the plug for rotating the latter. The plug is then forced into position by the shaft M with the ring 1 upon the shoulder 12, the rim 3 of cap 15 being passed inside the lugs 13 by the recesses 4, and the spindle M is rotated so as to turn the cam-surfaces of the rim 3 upon the lugs 13 and force the plug hard home with the ring 1 pressed against the shoulder 12, so as to form a tight joint. The gate-valve and plugging-machine are then removed and the plug packed between the cap 15 and the outer end of the pipe D, so as to permanently close the latter, the construction thus being completed without a gate-valve between the plug and main.

The sectional sleeve shown in Figs. 1 and 2 and previously described forms a simple and efficient construction; but I have shown in Fig. 6 a modified construction of sectional sleeve which avoids the use of the packing 11 about the main A and in which space is provided between the sleeve and main for calking, thus forming a very durable construction. In this construction the sleeve C is formed in two parts, secured together by bolts on opposite sides of the main. The plain section of the sleeve is clamped directly against the main; but the section carrying the pipe D and branch E is so constructed as to be secured by clamping at a short distance from the main, space thus being afforded for calking. In this construction the sectional sleeve is first placed upon and clamped to the main, and the spaces left between the sleeve and main are calked, as shown at 39. In this figure I have shown also a modified construction of the outer end of pipe D and the plug for closing the same. In this construction the shoulder 12 is constructed so as to form a conical opening, and the head 14 of the plug is adapted to form a tight joint therewith by being forced into and engaging the sides of the conical opening instead of resting directly upon a plain shoulder, as in the construction previously described. The head 14 is provided with the ring 1, of yielding material, preferably of lead, which forms the surface engaging the shoulder 12 and by which a tight joint is formed, as in the construction previously described. With this conical construction of shoulder 12 and head 14 the same construction of cap and lugs as previously described may be used. It is evident, however, that the cap 15 and pipe D may be formed in any suitable manner so as to produce the cam action, and I have shown in this figure a construction in which the pipe D is provided in place of the lugs 13 with a screw-threaded

ring 40, projecting within the pipe, and the cap 15 is screw-threaded to engage this ring 40, the screw-threads thus forming spiral cam-surfaces, as in the construction previously described. By this construction it is evident that the head 14 will be forced inward to form a tight joint by the rotation of cap 15, as in the construction previously described. I prefer, however, to use the construction previously described, as it is much cheaper in manufacture, the expensive operation of cutting screw-threads being avoided and all the parts being formed directly by casting.

It is evident that many other modifications may be made in the construction shown and described as the preferred form of embodiment of my invention, and my invention is not to be limited to the exact construction shown.

What I claim is—

1. The combination with sectional sleeve C having integral therewith a hub consisting of straight pipe D having shoulder 12 and constructed to coact with a spiral cam-plug, and branch E, of a plug having head 14 seated on said shoulder and a spiral cam-cap 15, substantially as described.

2. The combination with sectional sleeve C having integral therewith a hub consisting of straight pipe D having shoulder 12 and lugs 13, and branch E, of a plug having head 14 seated on said shoulder and cap 15 having rim 3 provided with slots 4 and spiral cam-surfaces, substantially as described.

3. The combination with sectional sleeve C having integral therewith a hub consisting of straight pipe D having shoulder 12 and constructed to coact with a spiral cam-plug, and branch E, of a plug having head 14 provided with a ring 1 of rubber, lead, or similar yielding material seated on said shoulder and a spiral cam-cap 15, substantially as described.

4. The combination with pipe D having shoulder 12 and constructed to coact with a spiral cam-plug, of a plug having head 14 seated on said shoulder and spiral cam-cap 15, substantially as described.

5. The combination with pipe D having shoulder 12 and lugs 13, of a plug having head 14 seated on said shoulder and cap 15 having rim 3 provided with slots 4 and spiral cam-surfaces, substantially as described.

6. A plug consisting of a head 14 and spiral cam-cap 15 pivotally connected thereto, so as to rotate independently of said head, substantially as described.

7. A plug consisting of a head 14 and cap 15 pivotally connected thereto, so as to rotate independently of said head, and having rim 3 provided with slots 4 and spiral cam-surfaces, substantially as described.

8. A plug consisting of the head 14 having ring 1 of rubber, lead, or similar yielding material, and spiral cam-cap 15 having a rotary pivotal connection therewith, substantially as described.

9. A plug consisting of the head 14 having
ring 1 of rubber, lead, or similar yielding ma-
terial, and cap 15 having a rotary pivotal con-
nection therewith and having the rim 3 pro-
5 vided with slots 4 and spiral cam-surfaces,
substantially as described.

In testimony whereof I have hereunto set

my hand in the presence of two subscribing
witnesses.

HARVEY H. BURRITT.

Witnesses:

GEO. H. BOTTS,
T. F. KEHOE.