

Jan. 31, 1933.

C. E. VAN HECKE

1,895,827

MAIN AND LATERAL CONNECTION AND METHOD OF FORMING SAME

Filed Jan. 25, 1930

3 Sheets-Sheet 1

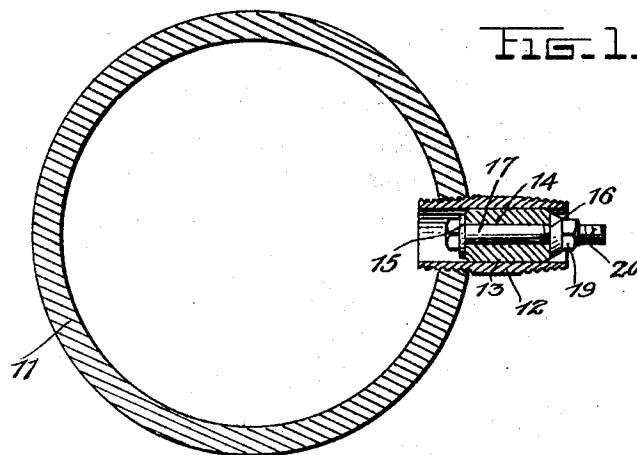
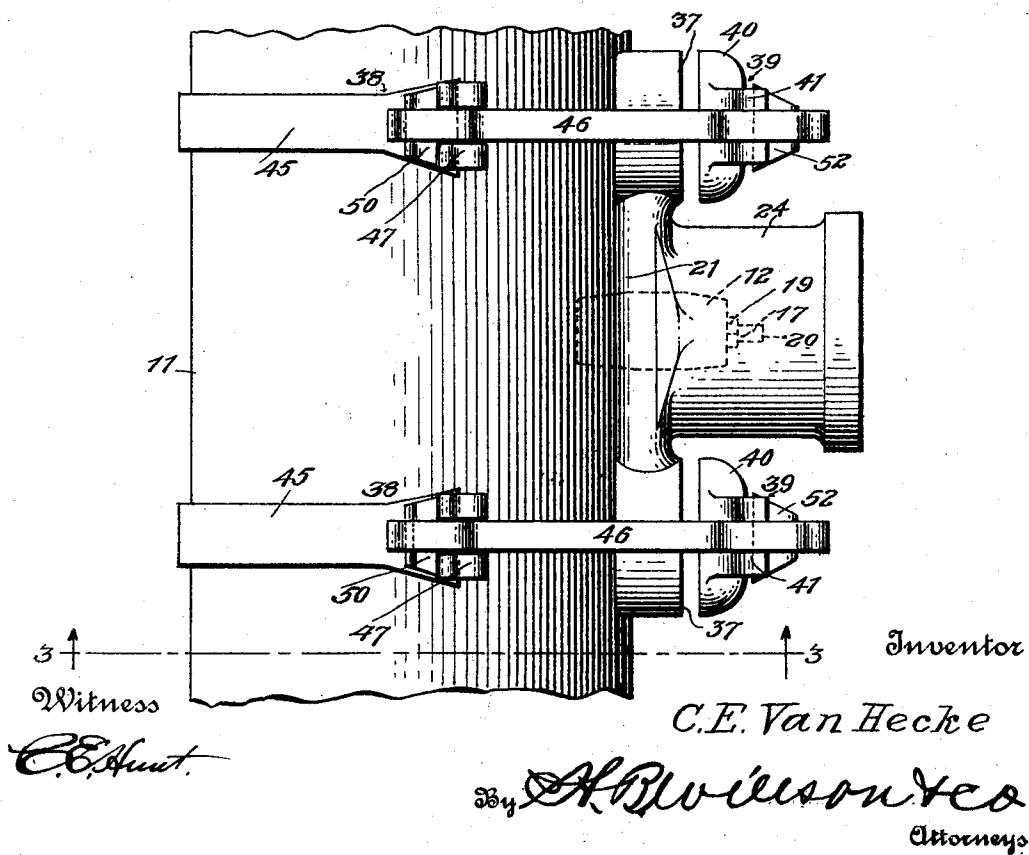


FIG. 2.



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3 Sheets-Sheet 2

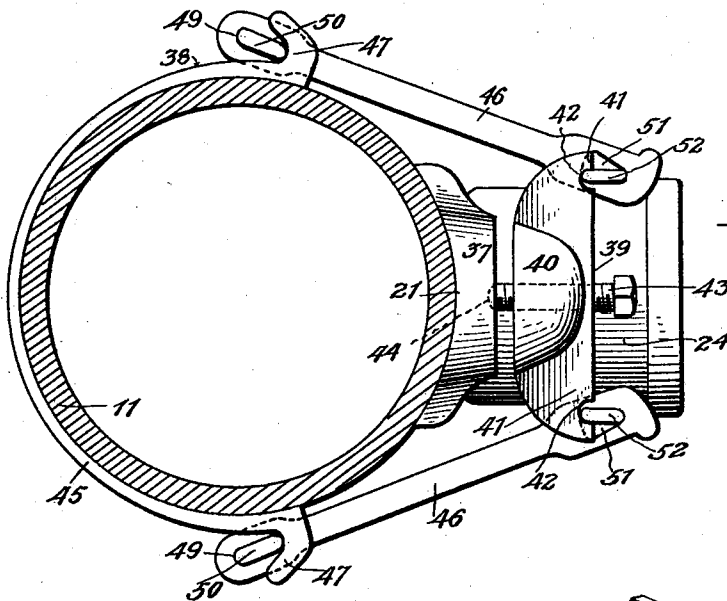


FIG. 3.

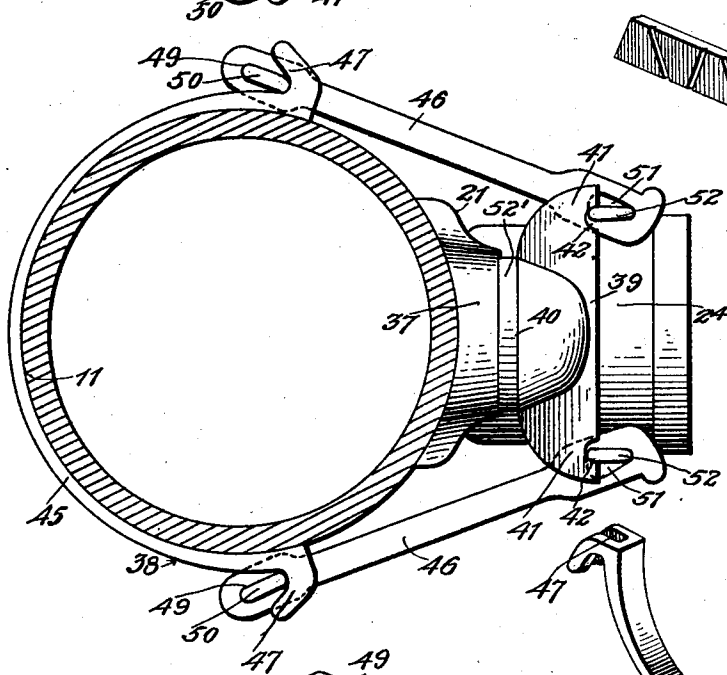


FIG. 4.

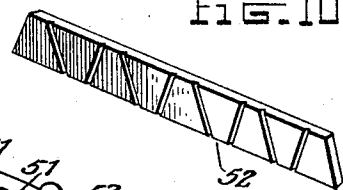


FIG. 10.

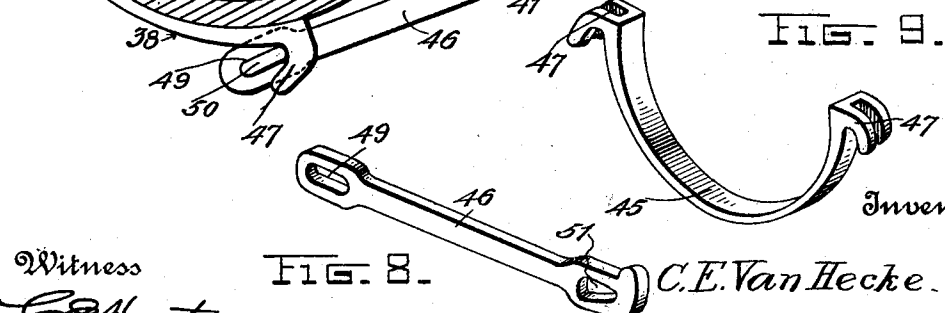


FIG. 8.

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FIG. 8.

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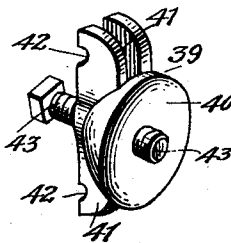
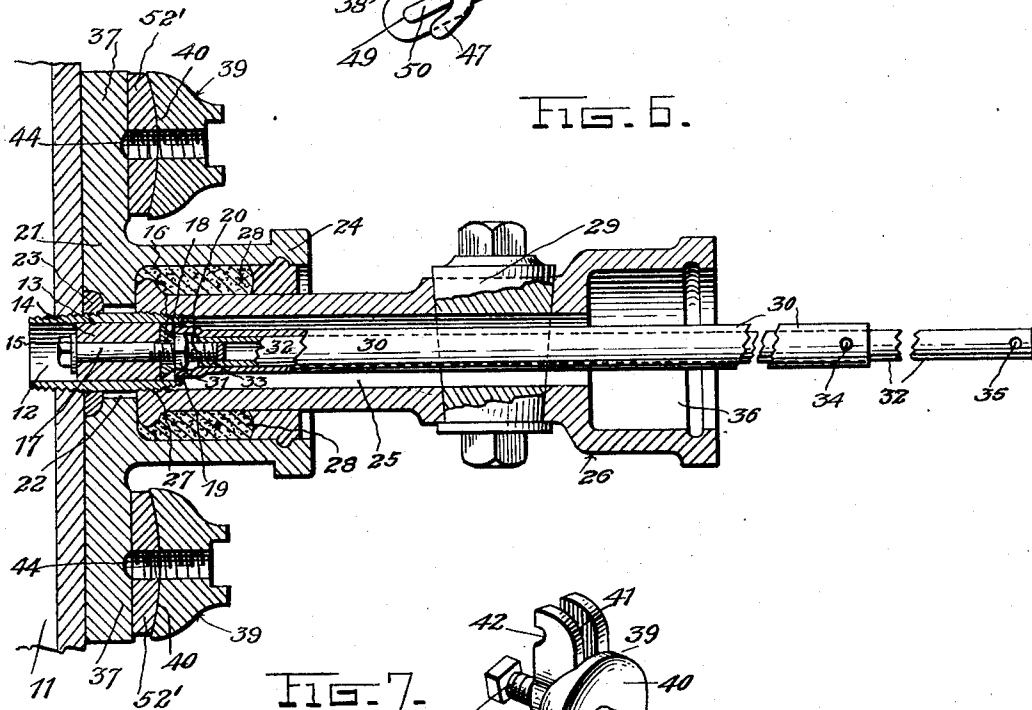
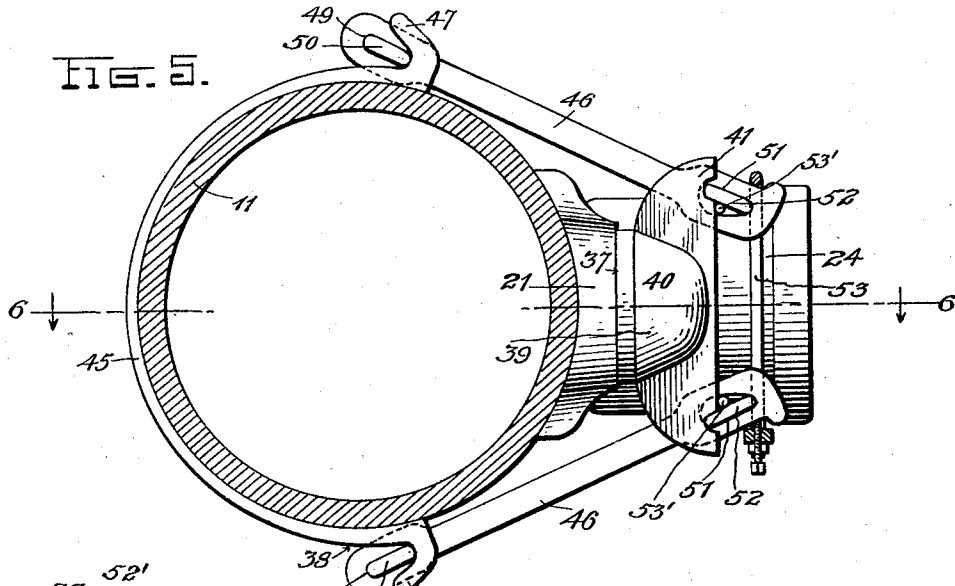
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MAIN AND LATERAL CONNECTION AND METHOD OF FORMING SAME

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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MAIN AND LATERAL CONNECTION AND METHOD OF FORMING SAME

Application filed January 25, 1930. Serial No. 423,496.

The invention relates primarily to connection of laterals with water, gas or other mains without the necessity of cutting off the fluid flow in any main with which a lateral is to be connected, but the invention is of course useable also if the flow be discontinued while the connection is being made.

With the aid of a known main-tapping machine, it is now possible to equip mains with plugged, projecting nipples with which to connect laterals, but cast-iron mains of present day manufacture, notably those formed by the centrifugal casting method, are so thin-walled that a reliable threaded connection cannot be formed between the nipple and main, there being not only danger of thread stripping, but liability of main breakage. It is hence the primary object of my invention to provide a new and improved method and means for connecting a lateral with a projecting nipple and effectively reinforcing the nipple-carrying portion of the main against breakage, the structural features and method steps being such that the plug remains in the nipple until the connection is complete.

A saddle is permanently yoked to the main and is provided with a bell which receives the main-carried projecting nipple, a service cock or other lateral fluid conductor is provided with a spigot end receivable in the bell and engageable with the nipple, and a calked joint is formed in said bell around said spigot end of the conductor, thereby providing a construction between lateral and main which will be fluid-tight and will resist all pressures and strains to which subjected.

Further objects are to provide new and improved method and means for securing the saddle to the main; to provide a nipple plug especially adapted for use with the present apparatus and method, and to make unique provision for releasing and removing the plug when its use is no longer required.

With the foregoing in view, the invention resides in the novel subject matter hereinafter described and claimed, description being supplemented by the accompanying drawings.

Fig. 1 is a transverse vertical sectional view

through a main and a plugged nipple projecting therefrom.

Fig. 2 is a top plan view showing the saddle initially clamped on the main around the nipple, the latter being illustrated in dotted lines.

Fig. 3 is a vertical transverse sectional view through the main on line 3—3 of Fig. 2, the main-engaging saddle and one of its clamping yokes being shown in elevation.

Fig. 4 is a view similar to Fig. 3, but showing the saddle of the clamping yoke "leaded" and its tightening screw removed.

Fig. 5 is a view similar to Fig. 4 but showing the clamping yoke contracted to final position and illustrating the clamp by means of which said yoke is contracted.

Fig. 6 is a horizontal sectional view on line 6—6 of Fig. 5 showing the service cock connected with the main-carried saddle and illustrating the special tool in the act of loosening the nipple plug.

Fig. 7 is a perspective view of one of the yoke saddles.

Fig. 8 is a perspective view of one of the yoke links.

Fig. 9 is a perspective view of one of the U-shaped yoke straps.

Fig. 10 is a perspective view illustrating a plurality of the yoke-contracting rockers integrally joined with each other in bar form. The yoke keys hereinafter described may be similarly formed if desired.

The preferred construction has been illustrated and while such construction will be herein specifically explained, it is to be understood that within the scope of the invention as claimed, variations may be made.

11 has reference to a main and 12 denotes a nipple threaded into said main and projecting laterally therefrom, said nipple being threaded also at its outer end. Within the nipple, is a plug 13 which includes an elastic cylindrical body 14 preferably of rubber. Disks 15 and 16 contact with opposite ends of this body and are provided with central openings, a bolt 17 passes through these openings, being slidable in the opening 18 of the disk 16, and a nut 19 is threaded on said bolt in contact with the disk 16.

The bolt is provided with an exposed threaded end 20 projecting beyond the nut 19 and distinguishing it from the conventional plumber's plug in which the free end of a much longer bolt is usually bent laterally and provided with a head. The plug 13 is expanded by tightening of the nut 19, such tightening serving to longitudinally deform the body 14 and hence cause radial expansion thereof into tight contact with the wall of the nipple 12. This nipple is tapped into the main 11 with a conventional tapping machine with which the present invention is not concerned.

A "hat flange" or main saddle 21 is provided to contact with the main 11, said saddle having an opening 22 to receive the nipple 12 and being provided with a groove-held packing ring 23 around the opening, said ring being formed of lead or other desired compressible material. The saddle 21 is provided with an integral hub or bell 24 with which the opening 22 communicates, so that when said saddle is applied to the main 11, the threaded outer end of the nipple 12 is received within and spaced from said bell. The saddle 21 is permanently secured to the main in a novel way hereinafter described, and after such anchorage, a spigot end 25 of a service cock 26 or other lateral fluid conductor, is inserted into the bell 24, said spigot end being provided with internal screw threads 27 which are engaged with the threads of the nipple 12 by rotating the cock or the like 26. This having been done, a calked joint 28 is formed in the bell 24, around the spigot end 25, providing a tight tenacious connection between the service cock or the like 26 and the saddle 21 and between said part 26 and the nipple 12.

To remove the plug 13 from the nipple, I provide a special tool insertible through the port of the usual plug 29 of the cock 26, when said plug is turned to open position. The tool is illustrated in Fig. 6 and from this view, it will be seen that the tool embodies a tube 30 having a nut socket 31 at its inner end, and a rod 32 within said tube and having a threaded socket 33, the sockets 31 and 33 being disposed at the same end of the tool. At its other end, the tube 30 may be provided with any desired means, for wrench engagement, for instance with openings 34 for engagement with a spanner wrench. Similarly, the outer end of the rod 32 may be provided with any adequate means for facilitating rotation of said rod, an opening 35 being shown through it for the purpose of receiving a spike or the like. The tool is inserted through the open plug 29, rod 32 is rotated to engage its socket 33 with the removal stud or the like 20 of the plug 13, tube 30 is moved to engage its socket 31 with the nut 19 of the plug 13, and said tube is rotated to loosen the nut and thus effect contraction of the

plug. Then, plug and tool are bodily withdrawn through the service cock or the like 26. If this operation be performed while the main 11 contains pressure, a stuffing box (not shown) will be temporarily connected with the outer end of the service cock or the like 26 and the plug will be withdrawn into the stuffing box. The plug 29 of the cock is then closed and the stuffing box and plug are removed. Now, a pipe line may be connected with the service cock or the like 26 in any desired manner. This cock is shown as provided with a bell 36 for a calked joint, but it may be flanged or otherwise constructed for connection with the lateral pipe line.

The means for permanently yoking or clamping the saddle 21 on the main 11, will now be described. This saddle, it will be observed, is provided with two end portions or seats 37 which project longitudinally of the main 11 from the inner end of the bell 24. Two yoke structures 38 embrace these saddle portions 37 and the main 11, and as the constructions of both yokes 38 and the steps followed in securing them, are identical, a specific description in connection with only one, will suffice.

Yoke 38 embodies an elongated saddle 39 having a central seat portion 40 and bifurcated ends 41 projecting in opposite directions from said seat portion, the furcations of said ends 41 being formed with transverse seats or grooves 42. A thrust screw 43 is threaded centrally through the portion 40 of the saddle 39 and is adapted for engagement with the portion 37 of the main-engaging saddle 21, which portion may be provided with a shallow recess 44 (Fig. 6) to receive the inner end of said screw. A U-shaped stirrup extends around the main 11 and has its ends connected with the ends of the saddle 39, said stirrup preferably consisting of a U-shaped strap 45 and two duplicate links 46 connected with the ends of said strap. These ends of strap 45 are preferably provided with laterally spaced hooks 47 between which the inner ends of the links 46 are received, said inner link ends having slots 49 through which keys 50 pass, said keys being engaged with the hooks 47. The other ends of the links 46 are provided with substantially ovate slots 51 through which rockers 52 pass. These link ends are received between the furcations of the saddle 39, and the rockers 52 rest in the grooves or seats 42, the rockers and the saddle 39 normally having the angular relation with each other, shown in Fig. 3. With the parts in this relation, the thrust screw 43 is forcibly tightened, thereby causing compression of the ring or gasket 23 and moving the saddle 21 into or substantially into contact with the main 11. In view of the fact that the screw 43 exerts an inward force upon the saddle 21 and an outward force upon the saddle 39, a space is

caused between said saddle 39 and the portion 37 of the saddle 21. With the use of suitable equipment for the purpose, this space is now poured full of molten metal such as lead, as indicated by the reference character 52'. Upon cooling and solidifying of the poured metal, the screw 43 is removed. Then, by means of a suitable clamp 53, such as that illustrated in Fig. 5, the outer ends of the links 42 are forcibly moved toward each other, during which movement, the rockers 52 are so tilted that they exert a tremendous contracting force upon the yoke 38, the force being so great that not only is shrinkage of the filler 52' (incident to cooling) compensated for, but said filler slightly compressed. Hence, the saddle 21 is secured upon the main 11 in an unusually tight and tenacious manner. When the links 46 have been moved inwardly to the maximum by the clamp 53, the rockers 52 lie against the outer walls of their receiving slots 51 and they are then slightly past dead center positions, so that the longitudinal strain on the links 46 will tend to hold said rockers in operative position, instead of permitting possible outward or releasing tilt thereof. After it has performed its function, the clamp 53 is removed. Should it be desired, pins or wedges 53' may be inserted in the slots 51 to hold the rockers 52 against any possibility of being tilted back to the position of Fig. 4. While this provision may be used if desired, it is not essential if the rockers 51 be moved sufficiently beyond dead center, by the clamp 53.

The tightening, "leading", and final contracting above described in connection with one of the yokes 38 are of course carried out also upon the other yoke.

When using the specific apparatus herein disclosed, the method steps incident to connecting a lateral with a plugged nipple 12 in a main 11 are as follows. The saddle 21 with its gasket 23 normally protruding beyond its inner face, is positioned upon the main 11 by passing the opening 22 over the projecting nipple 12, the outer end of the latter being received in the bell 24. The two yokes 38 are then assembled and are forcibly tightened by means of the thrust screws 43. Then, the fillers 52' are applied and the screws 43 are removed. Next, the clamp 53 is engaged with the outer ends of the links 46 and by operation of said clamp, tilting of the rockers 52 is effected, thereby causing final and tight contraction of the yokes 38. Now, the service cock 26, or rather the spigot end 25 thereof, is inserted into the bell 24 and said cock is rotated to thread said spigot end upon the outer end of the nipple 12. This having been done, the calked joint 28 is formed. Now, with the plug 29 open, the dual tool 30—32 is inserted through the service cock 26. Rod 32 is rotated to engage its

socket 33 with the threaded stud or the like 20 of the plug 13, tube 30 is turned until its socket 31 will receive the nut 19, and said tube is then rotated to loosen the nut and cause contraction of the plug 13. The tool and the plug are then bodily withdrawn through the service cock 26 and the valve 29 is closed. If these operations be carried on while the main 11 contains pressure, the plug 14 is withdrawn into a stuffing box temporarily connected with the outer end of the service cock 26, and this stuffing box is removed after closing the plug 29. Now, the branch line may be connected with the service cock, attention being again invited to the fact that although the outer end of this cock is shown provided with a hub or bell 36, it could well be equipped with any other desired means for attaching the line thereto.

The device affords what would commonly be termed a rigid connection which is the same in principle as the lateral on a pipe T or other solid branch connection. It enables the installation of a straight-away lateral line. It is not practical to provide a rigid connection on the common and prevalent types of corporation-stops, not so much because of danger of breaking the main as because of danger and almost certainty of breaking the corporation-stop itself. Hence, lead goose necks are commonly employed in connection with the corporation-stops to give flexibility to the connections, for said stops will not stand a rigid lateral strain. They are of rather frail construction and are not braced and hence the connection itself is the commonly weak point in a service line installation. Due to my invention however, all features of frailty and lack of durability are effectively overcome, together with all likelihood of leakage.

Under the most rigid tests, the details of structure and the method steps herein disclosed, have proven efficient and advantageous from all viewpoints. Hence, the present disclosure is to be considered as preferred, with the understanding however, that within the scope of the invention as claimed, variations may be made.

I claim:—

1. A method of reinforcedly and rigidly connecting a lateral fluid conductor having an internally threaded spigot end with a main having a previously attached externally threaded lateral nipple; comprising the steps of shifting a bell-equipped saddle inwardly along the previously attached nipple and disposing the bell of said saddle around the outer end of said nipple, then securing the saddle to the main, inserting the internally threaded spigot end of the fluid conductor into said bell and rotating said conductor to interengage the threads of the conductor and nipple, and forming a calked joint in said

bell around said spigot end of said fluid conductor.

2. A method of rigidly connecting a corporation cock having an internally threaded spigot end with a main having a previously attached externally threaded lateral nipple; comprising the steps of shifting a bell-equipped saddle inwardly along the previously attached nipple and disposing the bell of said saddle around the outer end of said nipple, then securing the saddle to the main, inserting the internally threaded spigot end of the corporation cock into said bell and rotating it to interengage the threads of the nipple and corporation cock, and forming a calked joint in said bell around said spigot end of said corporation cock.

3. In a rigid connection between a main and a lateral fluid conductor, an externally threaded lateral nipple rigidly connected to the main, a saddle secured on the main and having a bell receiving and spaced around the outer end of said nipple, a spigot end on the conductor extending into said bell and threaded upon said outer end of said nipple, and a calked joint in said bell around said spigot end of said conductor.

In testimony whereof I have hereunto affixed my signature.

CHARLES E. VAN HECKE.