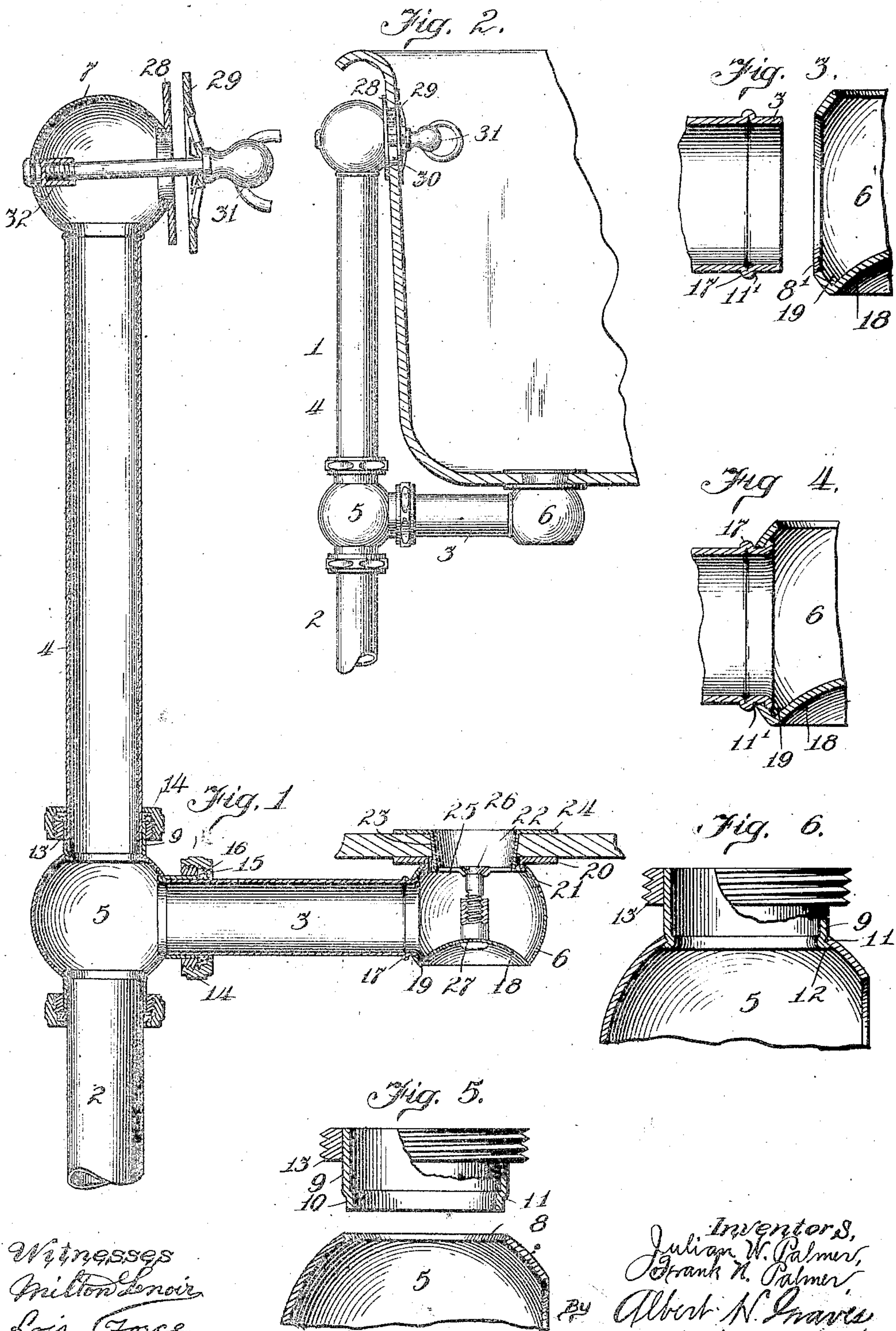


J. W. & F. N. PALMER.  
PLUMBING FIXTURE.  
APPLICATION FILED APR. 2, 1908.

915,792.

Patented Mar. 23, 1909.



Witnesses  
Milton Lenoir  
Lois Force

Inventors,  
Julian W. Palmer,  
Frank N. Palmer,  
By Albert N. Graves  
Attorney.



# UNITED STATES PATENT OFFICE.

JULIAN W. PALMER AND FRANCIS N. PALMER, OF KENOSHA, WISCONSIN, ASSIGNORS TO  
THE FROST MANUFACTURING CO., OF KENOSHA, WISCONSIN, A CORPORATION OF  
WISCONSIN.

## PLUMBING-FIXTURE.

No. 915,792.

Specification of Letters Patent.

Patented March 23, 1909.

Application filed April 2, 1908. Serial No. 424,808.

*To all whom it may concern:*

Be it known that we, JULIAN W. PALMER and FRANCIS N. PALMER, citizens of the United States, residing at Kenosha, in the county of Kenosha and State of Wisconsin, respectively, have invented certain new and useful Improvements in Plumbing-Fixtures, of which the following is a specification.

This invention relates to improvements in plumbing fixtures, and in the specific embodiment shown relates to an improved bath tub fixture.

Among the salient objects of the invention are to provide a construction the parts of which may practically all be formed of tubing and sheet metal union members, as distinguished from analogous structures the union members of which are largely formed of castings; to provide a construction which enables a nurling or spinning tool to be used for uniting most of the parts and in this respect effects a better and more economical union; to provide a construction which when completed presents a more finished and graceful appearance and at the same time employs less metal in its construction, and in general to provide an improved construction of the character referred to.

To the above ends the invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims.

In the drawings—Figure 1 is a vertical axial sectional view of a fixture embodying our invention; Fig. 2 is a side elevation of the same fixture shown applied to a bath tub, a fragmentary portion of the latter being shown in vertical section; Fig. 3 is a sectional fragmentary detail of the parts which when united constitute the terminal of the main outlet connected with the bottom of the bath tub; Fig. 4 shows the same parts shown in Fig. 3, after being united; Fig. 5 is a fragmentary detail in section of the union globe and parts which are connected therewith; Fig. 6 shows the same parts as shown in Fig. 5, after being united.

In the making of plumbing fixtures of the general type or character of that herein shown, it has been customary to employ cast metal unions for connecting up the various pipe sections, and this, of course, involves the objections incident to the use of castings, such as the necessity of dressing the

exteriors, largely by hand; the loss of defective castings; the employment of an unnecessary amount of metal; the impossibility of casting parts with the same accuracy that they can be made when die formed, etc.

The use of drawn or spun metal union pieces has heretofore been seriously handicapped by reason of the necessity of a special set of dies or other forming apparatus for each particular union piece, and again the expense of making suitable union joints has usually been as great where the parts were die formed as though they were cast. To overcome these several difficulties, we have devised a form of union which, while capable of being cheaply and accurately made from sheet metal, at the same time lends itself to the connection therewith of pipe sections arranged at almost any desired angle to suit various exigencies, and at the same time this union member lends itself to a method of connection with the pipe sections which is at once rapid, economical and productive of first class joints.

It will be apparent that any joint which is to be united by a spinning or nurling process must be circular and arranged concentric with the axis of rotation of the nurling tool at the time of performing the operation. At least the foregoing is true as to a general proposition.

In its broader aspect our invention resides in utilizing spherical union members to which the other members are joined by spinning or nurling; the use of the spherical-shaped union enabling us to join pipe sections there to by the method mentioned, as will now be described.

Describing the specific embodiment of the invention shown, 1 designates as a whole a bath tub drainer, comprising a main drain pipe 2, branches 3 and 4 connected with the bottom of the tub and with the upper portion of one end thereof, respectively, and union members 5, 6 and 7 at the juncture of the branch pipes, at the point of connection with the bottom of the bath tub and at the point of connection with the upper part of the tub, respectively.

Each of the three union members 5, 6 and 7 is in the main spherical; that is to say, each consists of a hollow sheet metal ball. The member 5 has connected therewith, in diametrically opposed relations, the pipes 2 and 4,



and at right angles to these, the branch pipe 3. Inasmuch as these connections are precisely similar, a description of one will suffice for all. To form one of these connections, we proceed as follows: The spherical member is provided with a circular aperture 8 (Fig. 5) of slightly less diameter than the exterior diameter of a nipple 9 which is to be united therewith, and said nipple 9 is provided with a reduced annular terminal portion 10 adapted to fit snugly in the aperture 8. The reduced portion 10 is conveniently formed by spinning, in which case the internal diameter of the tube will be slightly reduced, although it would be within our invention to form this reduced portion 10 by turning off the exterior of the tube. In either case an annular limiting shoulder 11 is formed at the point where the reduced portion joins the main portion of the nipple, which shoulder serves as a stop to limit the insertion of the nipple inside the union member. The two parts are next assembled and a rotating tool inserted so as to extend axially in through the nipple and having at its inner end an out-turned spinning nose or nurl which will engage the terminal edge of the reduced portion 10, and in the rotation of the tool expand or spin said edge outwardly within the union member, as shown clearly at 12 (Fig. 6). It will be obvious that if the member 5 be accurately spherical, and the aperture 8 formed therein be truly circular, then the perimeter of the aperture 8 will lie in a plane and accordingly if the nipple 9 have its end cut off at right angles to its axis the joint will not only be truly circular but will be concentric with the longitudinal axis of the nipple. Consequently when the spinning or expanding tool is entered through the nipple, and rotated with its axis of rotation coincident with the axis of the tube, the spinning operation will be accurately and perfectly performed.

To unite the main section of the tube with the nipple, the latter is provided with an external threaded portion 13, which in practice we find it most advantageous to unite with the nipple by sweating or soldering. Of course, this portion might be formed integrally with the nipple. The main tube section is made of such external diameter as to telescope and fit closely within the nipple, and an internally threaded union ring 14 is arranged to fit upon the member 13. This ring 14 is provided at one end with an inturned flange 15, the inner perimeter of which extends close to the exterior of the tube section, and between this flange and the opposed end wall of the nipple is interposed a compressible gasket or packing ring 16. As the coupling ring is advanced upon the threaded nipple the packing ring is compressed and thus made to seal the connection between the nipple

and the tube; the frictional grip of the packing ring being sufficient to hold the tube against endwise movement.

Of course, the several nipples 9 may be of any desired length and the union rings and connected ends of the tubes thus located at varying distances from the union member 5.

In uniting the member 6 with the branch pipe 3 the nipple member is dispensed with and the tube connected directly to the spherical union member. As best shown in Figs. 3 and 4, the union member is provided with an aperture 8' adapted to receive the end of the tube member 3, and in this instance to form the limiting or stop shoulder 11' the tube section is provided with an external bead 17. This bead is conveniently formed by spinning in a familiar manner. The parts are assembled and united by a spinning tool inserted and operated in precisely the same manner as before described.

To avoid the retention of any considerable amount of water in the lower part of the union member 6, we bend in the bottom portion of said member, as indicated at 18, by means of a suitable forming die, so that the bottom of the union member is internally convex, and, with the exception of a small angle 19, raised above the lowermost level of the interior of the pipe 3. In other words, the water will all drain out except a very small amount in the said angle 19. This bending in of the bottom 18 incidentally leads to another advantage, as will hereinafter appear.

To the upper side of the union member 6 is united a flange or collar 20 (see Fig. 1), which collar is provided with a relatively short nipple-like extension 21 which is fitted into a corresponding aperture in the top of the union member and is expanded into the latter in substantially the same manner as is the pipe 3. The under face of the flange body serves in this instance to form the shoulder or stop which limits the insertion of the nipple portion.

To complete the connection of the fixture to the bath tub, a thimble or trimmer is fitted into the aperture through the bottom of the tube; this thimble comprising a tubular body 23, an out-turned flange 24 and a spider 25 extending across the lower end of the tubular body 22. Centrally through the spider is formed an aperture to receive a clamping screw 26, the lower end of which engages an internally threaded stud 27, which is united by riveting or otherwise with the upper part of the convex bottom member 18. The bending in of the bottom of the union member 6 thus serves to conceal the riveted head of the stud 27 and brings the latter much closer to the bottom of the tub so that a much shorter screw can be used for uniting the parts.



The union member 7 is united with the upper end of the tube section 4 in precisely the same manner that the tube member 3 is united with the member 6. So also a collar or flange member 28 is united with said member 7 in the same manner as is the similar collar 20 united with the member 6. A skeletonized disk or washer 29 is arranged to overlie the outlet aperture 30 of the tub, and this washer is held in place and the upper end of the fixture secured to the tub by means of a screw-bolt 31 which extends centrally through the washer and into a stud 32 mounted upon the opposed side of the union member 7.

It will be noted that the flange member 28 is inclined from the vertical slightly to conform to the slant of the end of the tub, and this construction is a good illustration of how the use of the spherical union member permits of the connection therewith of tube or nipple sections disposed at any desired angle relatively to another attachment.

The specific fixture shown herein possesses numerous advantages in its details of construction, among which may be mentioned the fact that it is of minimum weight and extremely neat and finished in appearance; that it is both internally and externally devoid of rough unfinished surfaces which would facilitate its becoming fouled; that the parts being made, as they are, entirely by machine and die work, can readily be made exact duplicates, so that an injured or defective part can be replaced without replacing the entire fixture, and owing to the fact that both the union members and pipe connections are of sheet metal, they are practically ready for nickeling or other suitable finish without expensive machining.

It is apparent that the invention is not limited to the exact details of construction shown except as set forth in the claims.

We claim as our invention:

1. In a bath tub fixture, the combination

with a drain pipe adapted to be connected with the bottom of a bath tub to extend horizontally therefrom, of means for effecting such connection, comprising a generally spherical sheet metal union member connected with said drain pipe and having its bottom side bent in into concave shape, a flanged collar connected with the upper side of said union member and having a tubular flange extension extending into the union member and expanded therein, a flanged thimble provided with a skeletonized bottom adapted to be seated in the aperture in the bath tub, and a clamping screw extended through said thimble and engaging the stud mounted upon the bottom wall of the union member.

2. In a plumbing fixture, the combination with a drain pipe, of a laterally extending out-let pipe, a generally spherical union member connecting said pipes, said union member having its bottom side bent in into concave shape to prevent trapping of water in the bottom thereof.

3. In a plumbing fixture, a hollow sheet metal union member forming a spherical exterior portion and a plurality of tubular connections connected therewith to extend at angles to each other, each tubular connection having its end inserted and fitted within a suitable aperture in the side wall of the union member, having its inner end margin flanged over the perimeter of the opening it occupies, provided exteriorly of the union member with an annular shoulder engaging the walls of the union member and cooperating therewith to form a rigid union, and an annular screw threaded enlargement upon the outer periphery of each tubular connection.

J. W. PALMER.

F. N. PALMER.

Witnesses:

J. H. CANTWELL, Jr.,  
GUS JACOB.