

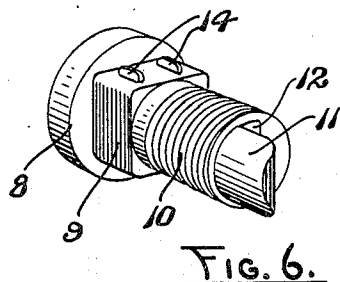
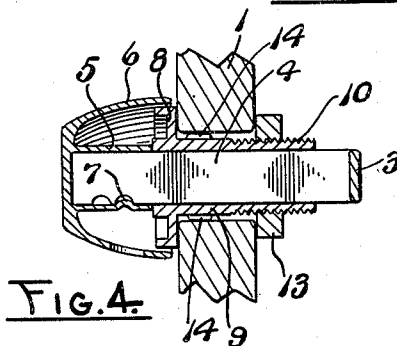
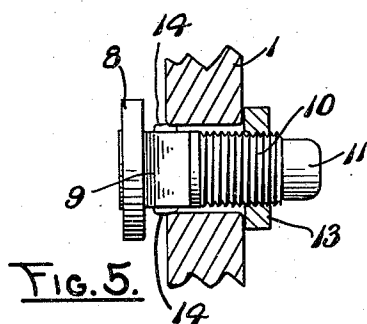
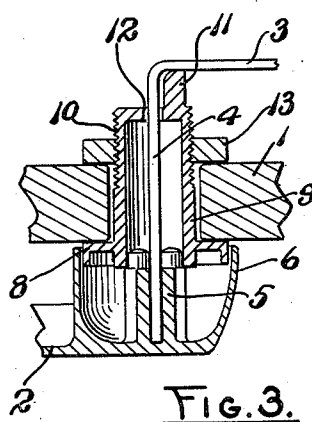
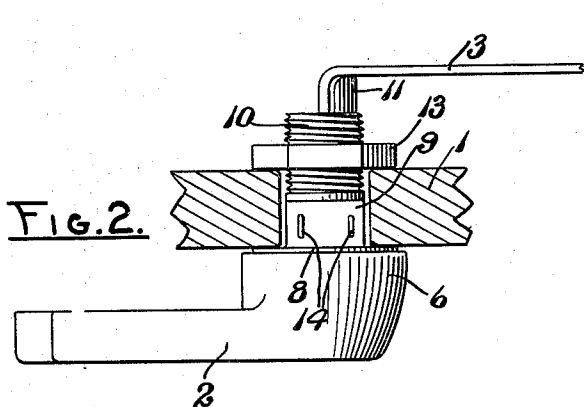
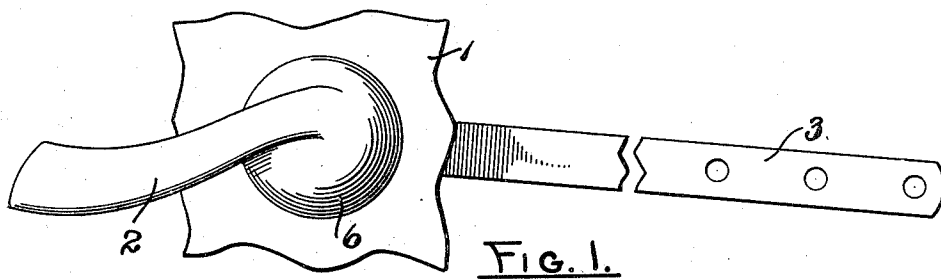
Feb. 14, 1950

B. R. CRAMPTON

2,497,396

SPUD FOR FLUSH TANK LEVERS

Filed July 22, 1946



INVENTOR
BASIL R. CRAMPTON
BY *Liverance and*
Van Antwerp
ATTORNEYS

UNITED STATES PATENT OFFICE

2,497,396

SPUD FOR FLUSH TANK LEVERS

Basil R. Crampton, Grand Rapids, Mich., assignor, by mesne assignments, to Crampton Manufacturing Company, Grand Rapids, Mich., a corporation of Michigan

Application July 22, 1946, Serial No. 685,486

1 Claim. (Cl. 4-67)

1

This invention is directed to a novel improvement in connection with the tank wall mounting fixture or spud, as it is named in the trade, of flushing tank levers.

In the mounting of flushing tank levers, the front wall of the tank a short distance below its upper edge, and toward one end of the tank, has an opening made through it for the passage of the spud. This opening is square in cross section, and the tank being generally, if not universally, constructed of a clay porcelain covered material which openings in different walls may vary by small amounts.

The normal or standard cross sectional dimensions of said tank wall opening are $\frac{11}{16}$ of an inch in each direction, with a tolerance of plus or minus $\frac{1}{32}$ of an inch. The spud which passes through said opening is provided with a head at its outer end to bear against the outer side of the tank wall, and has a section adjacent the head square in cross section which must be made small enough in cross sections dimensions that it will freely enter any opening and, therefore, its cross sectional dimension must be less than the $\frac{11}{16}$ of an inch that is less than the tolerance which is used at least for surety less what may be the decrease in the dimension which comes from the flow of porcelain material into said opening. The spud is secured to the tank wall by a binding nut screwed on to its inner portion to bear against the inner side of the tank wall. Heretofore in order to insure against a limited change of position of the spud rotatably about its longitudinal axis, the binding nut has been tightened with a view of obtaining a rigid immovable connection of the spud with reference to the wall. This involves a danger of breaking or crushing the somewhat weak or frangible tank material if the nut is tightened sufficiently. The spud has potential rotative movement about its longitudinal axis which, if it should occur at the outer end of the lift arm of the flushing tank lever is greatly multiplied, with a resultant disturbance and change of the lifting of the lift wire connected with the lift arm and the ball valve which is connected to the lower end of the lift wire, so that the flushing tank seal by the ball valve may be damaged.

The present invention is directed to a very simple and novel improvement of the spud of the flushing tank lever, which insures that the spud may be mounted upon and extend through such opening in the tank wall and with the nut tightened to a lesser degree than heretofore con-

2

sidered necessary, the spud is securely held against such limited rotative movement about its longitudinal axes, in any and all of the slightly different cross sectional dimensions of the tank wall openings, at either the minimum or maximum dimensions which said openings may take or any dimensions between such minimum and maximum.

An understanding of the invention may be had from the following description, taken in connection with the accompanying drawings, in which,

Fig. 1 is an elevation showing the flushing tank operating handle and lift arm, one at the outside and the other at the inner side of the tank, a fragmentary part of the tank wall being shown.

Fig. 2 is a fragmentary horizontal section through the tank wall at the spud passing opening therein, the flushing tank lever being shown in plan.

Fig. 3 is a horizontal section through both the tank wall and the flushing lever at the place of mounting.

Fig. 4 is a vertical section centrally through the flushing tank spud, the adjacent tank wall and parts associated therewith.

Fig. 5 is a fragmentary vertical section through the tank wall at its spud passing opening, and an elevation of the spud as it is being drawn into place, and

Fig. 6 is a perspective view of the spud of my invention with the improvement made thereon.

Like reference characters refer to like parts in the different figures of the drawing.

The front vertical side 1 of the tank wall has an opening therethrough, square in cross section, for the passage of the lever mounting fixture or spud, the lever being operated from the outside of the tank by a handle 2, while at the inside of the tank a lift arm 3 forms a part of the lever, it having a series of spaced openings at its outer free end at a selected one of which the ball valve lift wire may be connected.

The lift arm 3 at its opposite end is provided with a transverse stem or spindle 4 located at right angles to the left arm and passing lengthwise of the spud. It is connected at its outer end with a sleeve member 5 which, together with a covering housing or skirt 6, are cast integral with the handle. The sleeve 5 has a longitudinal passage from its inner end which terminates short from the outer side of the handle to receive the outer end portion of stem or spindle 4, which is notched at an edge thereof and the adjacent

metal of the sleeve 5 swaged thereinto, as shown in Fig. 4.

The spud (Fig. 6) is formed with a circular head 8, the diameter of which is greater than any transverse dimension of the opening through the tank wall, so that it bears against the outer side of the tank wall around the spud passing opening. From the head 8 a body section 9, substantially square in cross section, extends into the wall opening, and from the inner end of the part 9, an exteriorly threaded stem 10 extends through the wall and beyond its inner side, said stem 10 at one side has a projecting finger 11, as shown, which prevents axial movement of the lever with respect to the spud on which it is mounted. It is to be understood that the spud is of a hollow construction with an inner closed end through which an opening 12 is made for the passage of the spindle 4 which opening is of a form which permits a limited rocking movement of the lever about the longitudinal axis of said spindle, so that on depression of the outer end of the handle 2, the lift arm 3 is elevated at its outer free end the required distance to lift the ball valve at the bottom of its seat in the tank. The cross sectional area of the body portion 9 is less than the cross sectional area of the opening through the tank wall as to permit the passage of the spud through the smallest opening which may be made. A binding nut 13 is used to secure the spud in place.

With my invention, at opposite sides of said section 9, spaced fins 14 are cast, integral therewith, and extend outwardly as shown in Fig. 6. The fins are relatively thin and may be not over $\frac{1}{64}$ of an inch in thickness and preferably not exceed .02 of an inch. They project outwardly from the adjacent surface of the squared section 9 a distance such that when the spud is applied at the opening (Fig. 5), they will come to the opening and will resist entrance thereinto. The ends of the fins entering said opening are of rounded character as shown in Fig. 6. Therefore, upon tightening the nut 13, the spud will be drawn to place from the position shown in Fig. 5 to that in Fig. 4, the outer edge portions of the fins 14 being crushed and upset. When the spud is drawn fully to place, the two opposite sides of the section 9 at two spaced apart portions thereof, where the fins 14 are located, will have bearings against two opposite inner sides of the opening, at two spaced small areas of each of said sides, maintaining the spud positively and securely against any possibility of rotative or rocking movement about its longitudinal axis.

The structure described is of a very simple character and thoroughly practical and very useful. The nut 13 does not require excessive tightening. The small dimensions in thickness of the fins 14 permits the ready drawing of the head of the spud 8 against the outer side of the tank wall without undue pressure or strain upon the wall. The structure has proved exceptionally useful.

The invention is defined in the appended claim and is to be considered comprehensive of all forms of structure coming within its scope.

I claim:

A tank wall spud or mounting fixture for a flushing tank lever comprising, a head and an integral portion extending from the head, said integral portion being square in cross section for a distance from the head, adapting it to enter square openings of variable dimensions through the wall of a flushing tank, but in no case being less than the cross section of said square portion of the spud, and said spud having extending beyond said square cross section thereof an exteriorly threaded portion, said section of the spud which is square in cross section, at two opposed sides thereof having spaced outwardly extending fins perpendicular to the faces from which they extend substantially paralleling each other and substantially paralleling the length of said spud, said fins being thin and extending outwardly a sufficient distance from the sides of said square cross section of the spud to extend beyond the adjacent surfaces of the square opening through the tank wall through which said spud is adapted to pass whereby said fins are adapted to be crushed between the sides of the square cross section of the spud at which they are located and the adjacent sides of a tank opening, such crushing taking place at all variations of space between the sides of the square cross section of the spud from which the fins extend and the adjacent sides of a tank opening into which it is adapted to be inserted.

BASIL R. CRAMPTON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,500,628	Leslie	July 8, 1924
1,989,018	Norwood	Jan. 22, 1935
2,056,309	Osenberg	Oct. 8, 1936