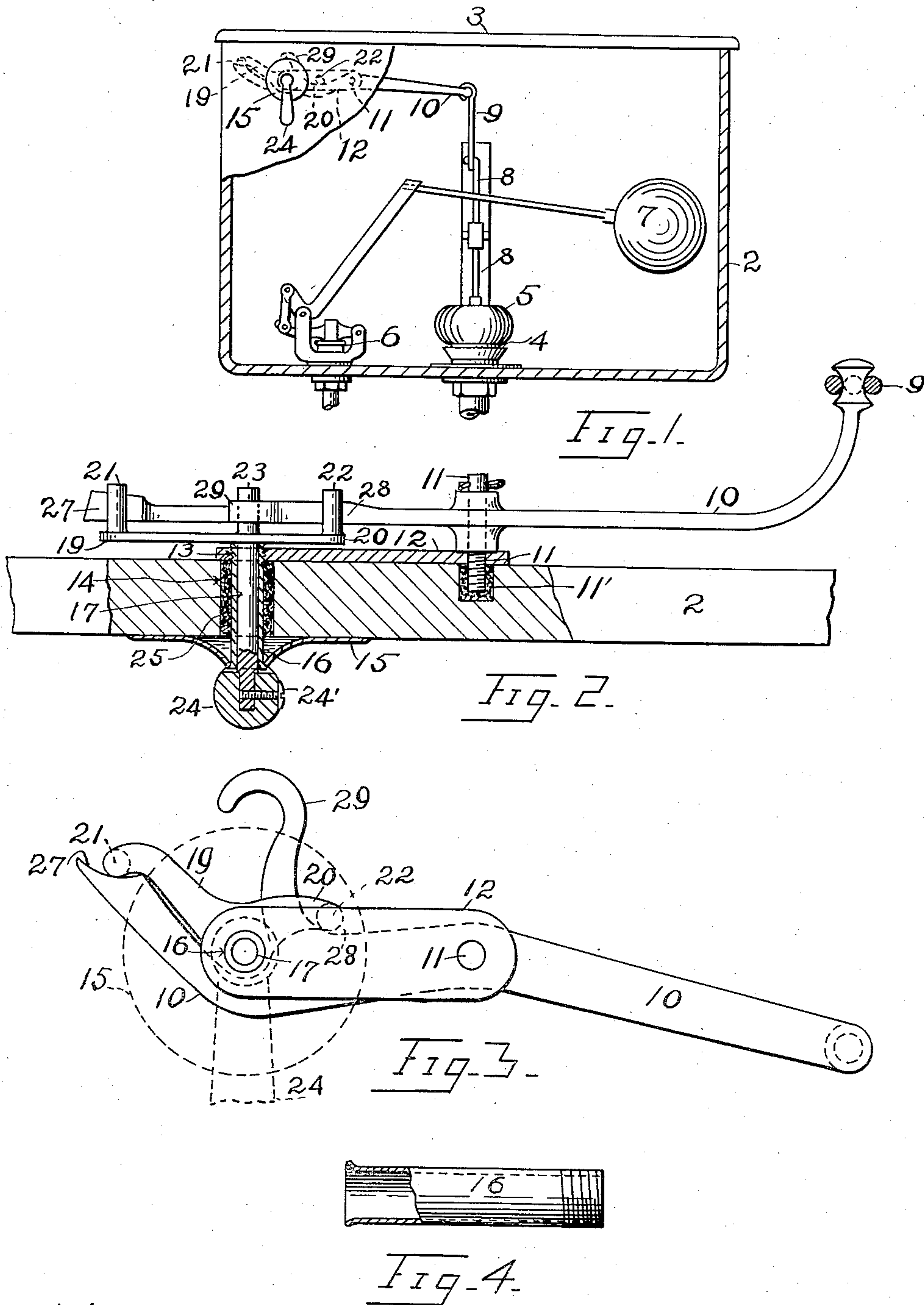


B. O. TILDEN.
 FLUSH TANK OPERATING MECHANISM.
 APPLICATION FILED MAY 11, 1909.

945,424.

Patented Jan. 4, 1910.
 2 SHEETS—SHEET 1.



Witnesses:
 J. F. Brewer.
 R. L. Wallace

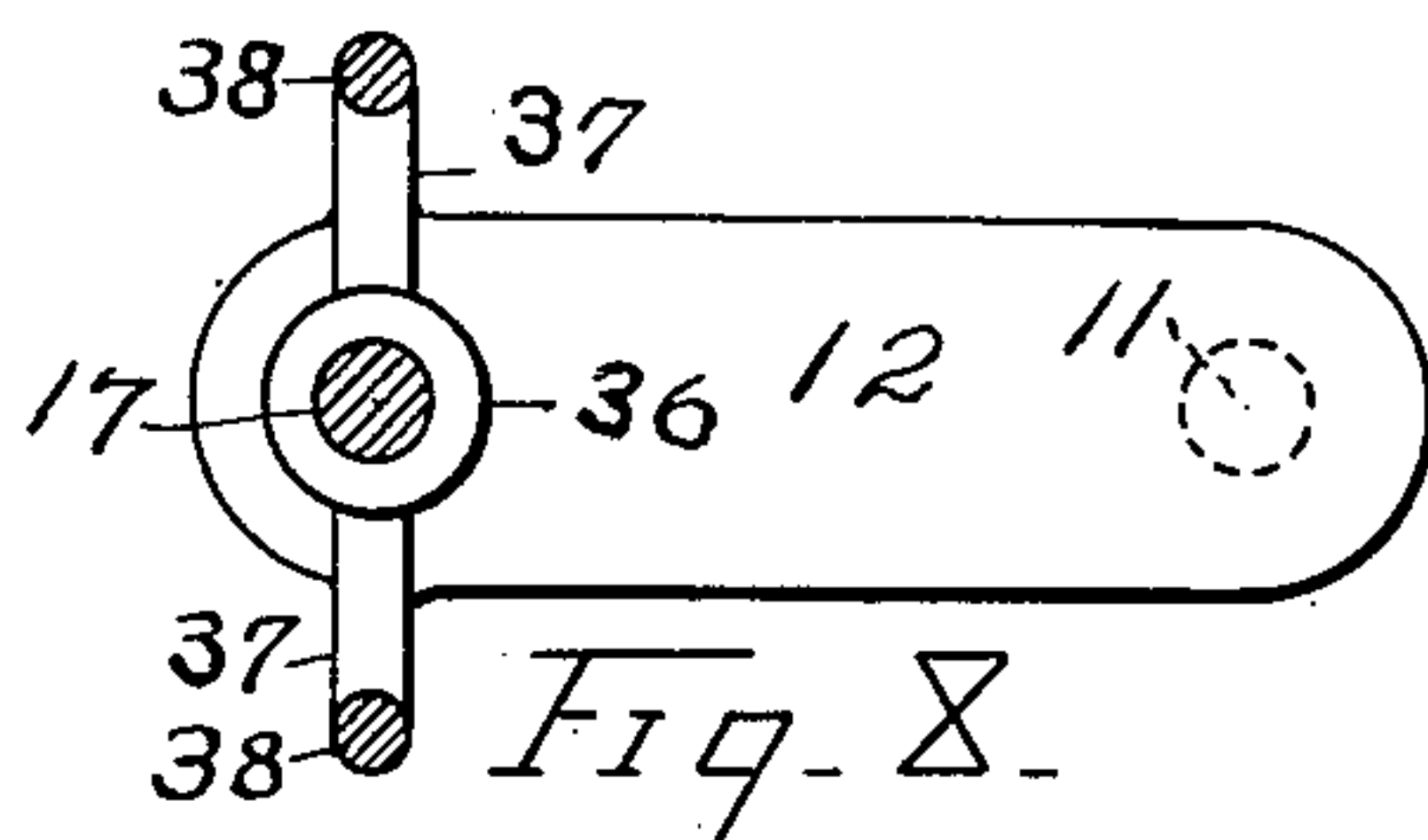
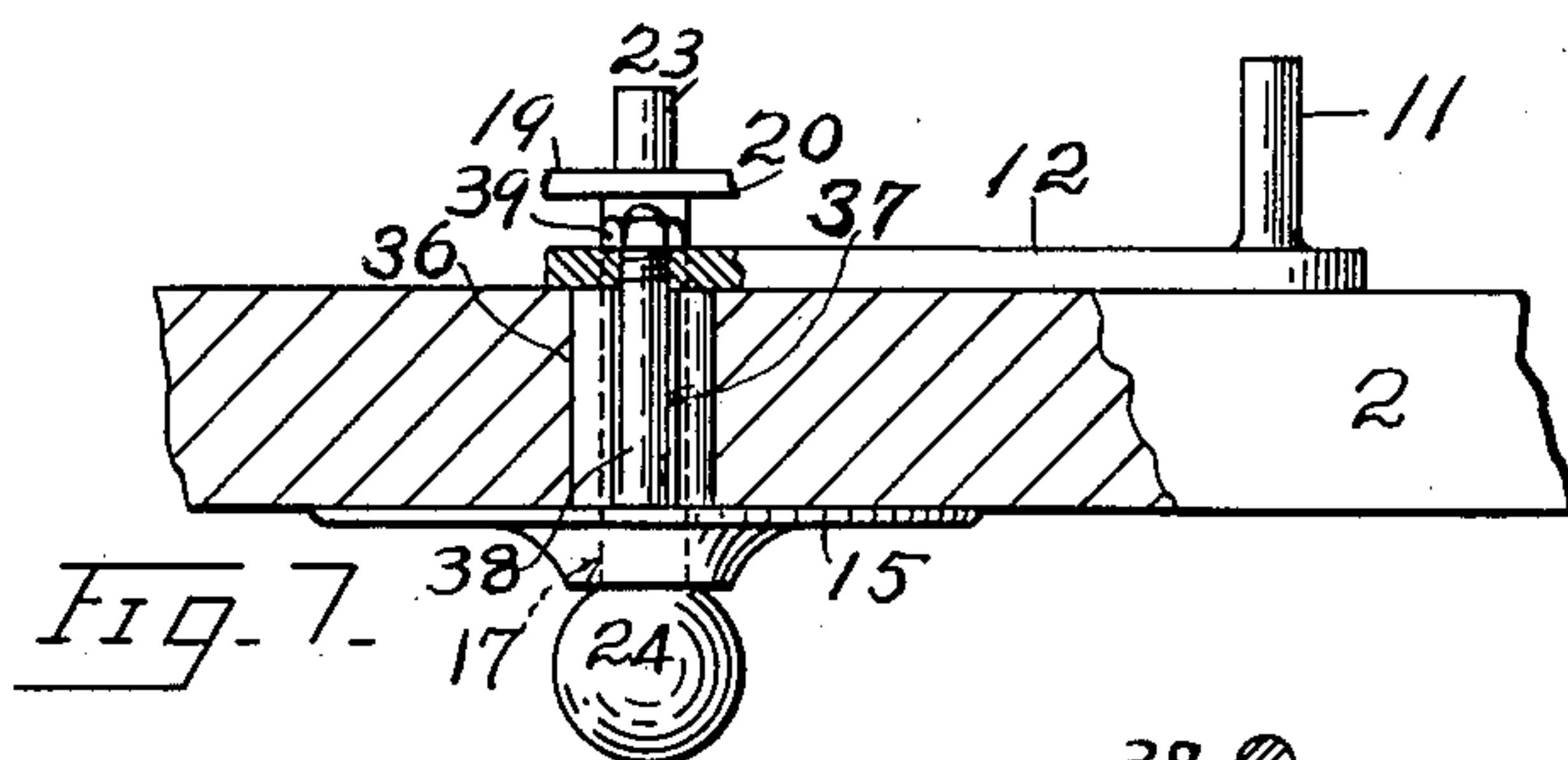
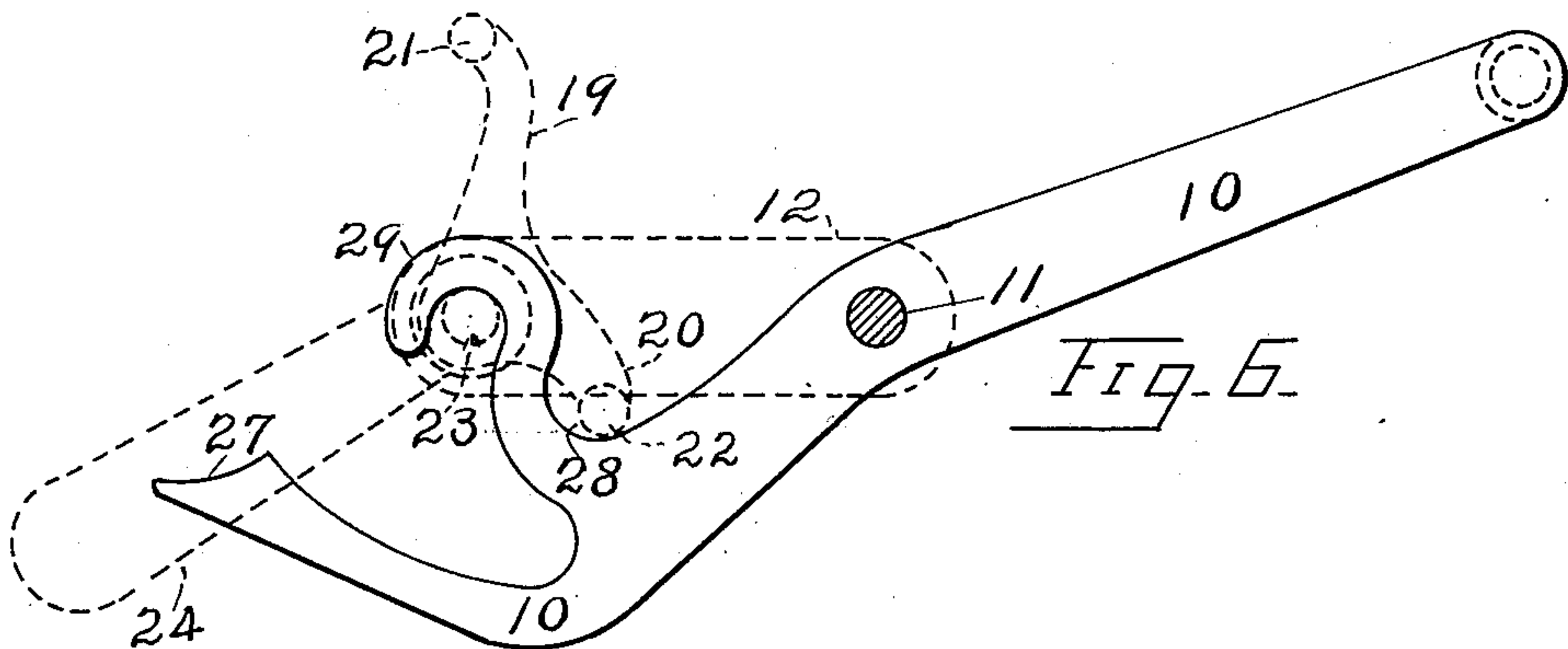
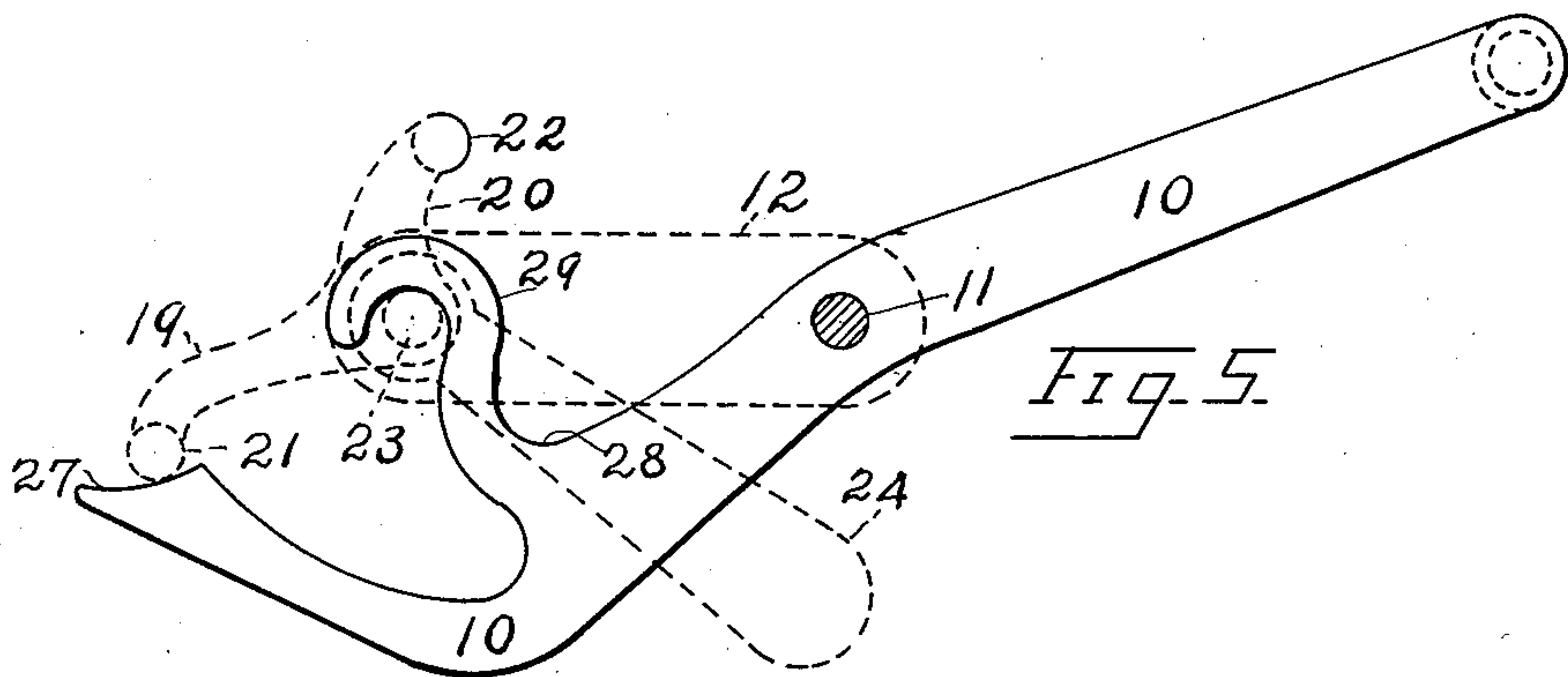
Inventor.
 Bert O. Tilden.
 By Harry D. Wallace.
 Attorney.

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2 SHEETS—SHEET 2.



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 By Harry D. Wallace,
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UNITED STATES PATENT OFFICE.

BERT O. TILDEN, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN SANITARY WORKS,
OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

FLUSH-TANK-OPERATING MECHANISM.

945,424.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed May 11, 1909. Serial No. 495,219.

To all whom it may concern:

Be it known that I, BERT O. TILDEN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Flush-Tank-Operating Mechanism, of which the following is a specification.

This invention relates to improvements in flush-tank operating devices, and the invention has reference to a mechanism for operating tanks connected to latrine bowls, and especially flush-tanks of the "low down" type.

The invention relates particularly to improvements in the devices shown and described in my United States Patents numbered 821,002 and 915,636, bearing date respectively May 22, 1906 and March 16, 1909.

The object of the invention is to provide an operating mechanism for unseating the flush valve, which is simple, durable and effective, and which is so constructed and arranged that the valve may be operated positively and readily, with but slight effort on the part of the user of a closet.

A further object is to provide novel and simple means for limiting the movement of the valve operating parts. And a particular object is to provide a novel and simple support or hanger for the operating parts, which requires but a single perforation in the walls of the tank, and which may be applied in service position without the use of any screws or bolts such as commonly employed in the older devices.

The invention consists generally of the features and parts set forth in the detail description which follows, and as illustrated by the accompanying drawings forming a part of this specification, and in which—

Figure 1 is a front view of the flush tank, partly in elevation and partly in section, showing the location and arrangement of the operating mechanism. Fig. 2 is an enlarged plan view, partly in section, showing the construction and arrangement of the operating parts, when the same are at rest and the valve closed. Fig. 3 is an enlarged detail view of the operating parts when they are at rest as in Figs. 1 and 2. Fig. 4 is an enlarged view of the hollow bolt or bushing employed for securing the hanger to the tank. Fig. 5 is a detail view, showing the

relative position of the parts when the operating handle is rocked to the right for opening the valve. Fig. 6 is a similar view, showing the position of the parts when the operating handle is rocked to the left for opening the valve. Fig. 7 is a view of a modified form of mounting or hanger, for the support of the operating parts. Fig. 8 is a detail plan view of a modified hanger shown in Fig. 7.

In the drawings, 2 represents a tank preferably made of earthenware or china, and having a cover 3. Within the tank 2 is located a flush valve seat 4 and its valve 5, also a water inlet valve 6, which is controlled by a float 7.

My improved flush tank operating mechanism comprises a series of parts which are mounted on the inner and outer sides of the front wall of the tank, preferably near the upper left corner.

As illustrated in Fig. 1, the flush valve 5 is closed by the vertically operable lift rods 8 and 9. The rod 9 connects at its upper end to one arm of a rocking valve lever 10, which is pivotally mounted by means of a stud 11 upon one end of a hanger plate or bar 12, which is disposed horizontally against the inside of the front wall of the tank. The stud 11 is preferably detachably connected to the plate 12 by means of threads as shown. The opposite end of plate 12 is provided with a threaded perforation 13, which registers with a perforation or opening 14 in the wall of the tank. On the face side of the tank is disposed an escutcheon or plate 15, preferably formed-up of sheet metal and circular, and which is centrally perforated to coincide with the opening in the tank and also with the perforation 13 of the plate 12.

16 represents a bushing or tubular bolt, the inner end of which is threaded to engage the threads of the hole 13 of the hanger 12, and its outer end is flared bell-shaped, to prevent the same from passing through the eye of the escutcheon.

In applying the operating parts, the escutcheon 15 is placed in position on the outside of the tank, and the bushing 16 is inserted through this part and then through the opening 14. The plate 12 is then placed in position on the inside of the tank, and the bushing is screwed into the plate, until

the plate and escutcheon are drawn tightly against the opposite sides of the tank wall. By this means the said parts may be held in rigid condition without any other attaching means, such as screws or bolts, and but one perforation (14) through the wall of the tank is required. In doing this work the final act should be to adjust the plate 12 to substantially true horizontal position, as shown in the drawings. After the plate and escutcheon have been secured in place the other parts may be applied.

17 represents a rock shaft which is inserted through and has its bearing in the bushing 16. The inner end of shaft 17 is formed into a double lever consisting of a long arm 19 and a short arm 20, which extend in opposite directions at right angles to the shaft. Each of the said arms are provided with an engaging stud, as 21 and 22.

23 represents a pin disposed concentric to the inner end of shaft 17 which projects beyond the arms 19 and 20 to the same extent as the studs 21 and 22. The outer end of the shaft 17 is reduced to receive a depending swinging handle 24, which is held in place by a screw 24'. After the hanger-plate or mounting 12 and related parts are applied to the tank, and the rock shaft and handle are attached as described, the valve lever 10 is next placed in position. The lever 10 is perforated near its center, to receive the stud 11, upon which it is adapted to tilt or rock. The threaded end of the stud 11 preferably projects a short distance through the plate 12 and enters a recess 11' in the wall of the tank for supporting and steadying the outer end of the plate. The lever 10 is disposed parallel to the plate 12, and its free end is provided with two spaced bearing surfaces or portions 27 and 28. The disposition and arrangement of the bearing surfaces of lever 10, and also the engaging studs 21 and 22 of the rocking lever are such that when the parts are at rest, as shown in Figs. 1, 2 and 3, and the operating handle 24 is held by gravity in vertical position, the engaging studs are brought in contact with the bearing surfaces 27 and 28, indicating the normal position of the parts when the valve is closed.

In all devices of the class herein shown and described, in order to insure the safe and proper handling of the mechanism it is desirable and necessary to in some manner limit the operative movements of the rocking parts, such as the valve lever 10, the rocking shaft 17 and handle 24. To accomplish this result in the present device, I provide a stop-hook 29 of peculiar shape, which is preferably formed integrally on the lever 10, and disposed between and clear of the studs 21 and 22 of the rocking lever, in position to engage the pin 23, when the handle 24 is rocked either to the right or

to the left, as shown in Figs. 5 and 6. Under this arrangement of the stop-hook the parts may be made stronger and more reliable, and less work and adjustment is required for preparing the parts for service. Furthermore the strain incident to the sudden stopping of the rocking parts at each opening of the valve, instead of being exerted against the stop-lugs of the later patent referred to, which tended to loosen the pivot 12 of the main rocking lever, under the present construction is thrown upon the pin 23, which is an integral part of the strong rock shaft 17, which is supported by the bushing 16.

Owing to the increasing demand for flush tanks made of metal, china, and composite structures such as metal coated with stone, and the like, it has been found necessary to provide a different mode of attaching the mounting for the valve operating parts. To this end it is desirable and necessary to have fewer perforations in the wall of the tank, and in china or vitreous tanks these openings must be formed before the tanks are baked or hardened, and this work must be done in a manner to provide suitably for the shrinkage and warping of the tank walls, and still permit of the operating parts being properly and securely applied. In the present invention the opening or hole 14 in the wall of the tank is at first made considerably larger than the diameter of the bushing 16, and when the tanks are baked and hardened, if the hole is still larger than the bushing, the same may be filled in with a suitable retainer such as litharge or other cement, as shown at 25 in Fig. 2. The same material may also be applied to the recess 11' which receives the inner end of the stud 11, and thus effect the rigid setting of the parts.

In Figs. 7 and 8 is illustrated a modified form of the mounting for the operating parts, consisting of a hanger plate 12, having an integral stud 11 at one end, to pivotally support the valve lever 10, which is omitted from Fig. 7. The opposite end of the plate 12 is provided with an oppositely facing hub or bushing 36, which is bored out centrally to receive and serve as a bearing for the rock shaft 17, and which is provided on its outer surface with oppositely facing ribs or flanges 37. The part 36 is preferably inserted through a hole in the wall of the tank which is substantially the same shape though preferably a trifle larger, the wings or flanges 37 are intended to prevent the other end of the plate from sagging, or changing its position under the weight and strain of the valve lever which is supported by the pivot stud 11. Under this modified plan, after the hub 36 is inserted through the wall of the tank, and the escutcheon 15 is placed in position on the outer side of the tank, and a pair of integral bolts or screws 38 which pro-

ject from the inner side of the escutcheon, are passed through the tank and also through the plate 12, a pair of nuts, as 39 are then applied to the inner ends of the bolts inside of the tank, to hold the parts in rigid position. This new style of mounting is preferably cast in one part as shown, thus reducing the number of parts and thereby effecting a saving in the manufacture, and at the same time producing a stronger and simpler mounting.

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

1. The combination with a flush tank and a flush valve in said tank, of a hanger plate mounted on the inner wall of the tank, one end of said plate fitted with a stud, the other end of said plate having a threaded perforation registering with a hole in the tank, an escutcheon mounted on the outside of the tank having a perforation coinciding with the threaded perforation in said plate, a hollow bolt inserted through the escutcheon and threaded into the said plate for securing said parts to the tank, a valve lever pivotally mounted on the stud carried by said plate, one end of said lever connecting with the flush valve, the other end fitted with a stop-hook, a rock shaft journaled in said hollow bolt, the inner end of said shaft having a two-arm rocking lever adapted to engage said valve lever on the opposite sides of said stop-hook, and a pin carried by said rocking lever adapted to coöperate with said stop-hook for limiting the movement of said operating parts.

2. A flush valve operating mechanism, comprising a valve lever pivotally disposed in a tank, a support for said valve lever, consisting of a plate having a stud at one end to carry said valve lever, the other end of said plate having a threaded perforation, an escutcheon mounted on the outer wall of the tank having a central perforation, a hollow bolt to connect said escutcheon with one end of said plate, a rock-shaft journaled in said bolt, the outer end of said shaft having a swinging handle, the inner end of said shaft formed into a rocking lever, each end of which contacts with and is capable of tilting said valve lever by the swinging of said handle, a stop pin formed on said rocking lever concentric to said rock-shaft, and a stop-hook carried by said valve lever adapted to engage said pin when said handle is swung in either direction for limiting the tilting movement of said valve lever.

3. A flush tank operating mechanism, comprising a valve lever disposed in the tank, a hanger plate in the tank, the said plate being perforated at one end to receive a stud for pivotally supporting the valve lever, the other end provided with a threaded perforation which registers with a hole in the

wall of the tank, an escutcheon mounted on the outside of the tank, the escutcheon having a perforation also registering with the hole in the tank, a hollow bolt to pierce said escutcheon, the tank, and said hanger plate, adapted to draw and hold said parts in rigid position, a rock-shaft journaled in said hollow bolt, a rocking lever comprising two arms formed on the inner end of said rock-shaft, adapted for operating said valve lever when said shaft is rocked in either direction, a stop pin formed on said rocking lever a handle mounted on the outer end of said shaft, and a stop-hook carried by said valve lever adapted to engage said stop pin for limiting the movement of all of said working parts.

4. The combination with a flush tank and a flush valve in said tank, of a lever connecting at one end with the flush valve, the opposite end being free and having two spaced bearing surfaces disposed in a common plane, a stop hook formed near the free end of said lever between said bearing surfaces, a rock shaft passing through the wall of the tank, an operating lever formed on the inner end of the rock-shaft, each end of said operating lever having a stud for engaging the bearing surfaces of said first named lever, the said rock-shaft extending beyond said operating lever to form a pin for engaging said stop-hook thereby to limit the rocking of both of said levers, a hanger bar in the tank having a stud at one end to support said valve lever, the other end of said bar having a threaded perforation arranged concentric to said rock-shaft, an escutcheon on the outside of the tank, and a hollow bolt adapted to secure said hanger bar and said escutcheon to the tank, the said bolt also serving as a bearing for said rock-shaft.

5. A flush tank operating mechanism, comprising a valve lever pivotally disposed within a tank, one end of said lever connecting with a flush valve in said tank, the other end of said lever provided with two spaced bearing surfaces, and a stop-hook positioned between said bearing surfaces, a rock shaft piercing the wall of said tank, a handle secured to the outer end of said shaft, a rocking lever formed on the inner end of said shaft, the said lever having one long and one short arm, each arm having an integral stud, normally in engagement with said bearing surfaces, and having a stop-pin disposed between said studs concentric to said shaft, the said pin adapted to engage said stop-hook for limiting the movement of said valve-lever and also said handle and operating lever, a mounting for said operating parts comprising a hanger-bar disposed in the tank, an escutcheon disposed on the outside of the tank, and a tubular bolt adapted to connect

and hold said hanger-bar and said escutcheon in place, the said bolt passing through a perforation in the wall of the tank and adapted to receive and afford a bearing for the said
5 rock shaft.

6. A mounting for flush tank operating mechanism, comprising a hanger-bar located inside a tank, having a threaded perforation at each end, the perforation at one end
10 adapted to receive a screw stud; a valve lever pivotally supported by said screw stud, an escutcheon disposed on the outside of the tank, and a hollow bolt having a flared end to engage the escutcheon, the other end
15 threaded to engage the opposite end of said hanger-bar, the said bolt capable of being inserted through the wall of the tank and screwed into said hanger-bar for drawing and clamping the said bar and said es-
20 cutcheon tightly against the inner and outer sides of the tank, the said bolt forming a

bearing for the shaft of a rocking lever employed for operating said valve lever.

7. A mounting for flush tank operating mechanism, comprising a hanger-bar located
25 inside a tank, a valve lever pivotally supported from said bar, a hollow bolt capable of being inserted through the wall of the tank and secured to said hanger-bar, the said bolt forming a bearing for the shaft of a
30 rocking lever employed for operating said valve lever, and means applied to said hanger-bar at a point in its length between said bolt and free end of the valve lever to secure said bar to the tank.

35 In testimony whereof I affix my signature in presence of two witnesses.

BERT O. TILDEN.

Witnesses:

A. L. PHIPPS,
W. B. MADDOCK.