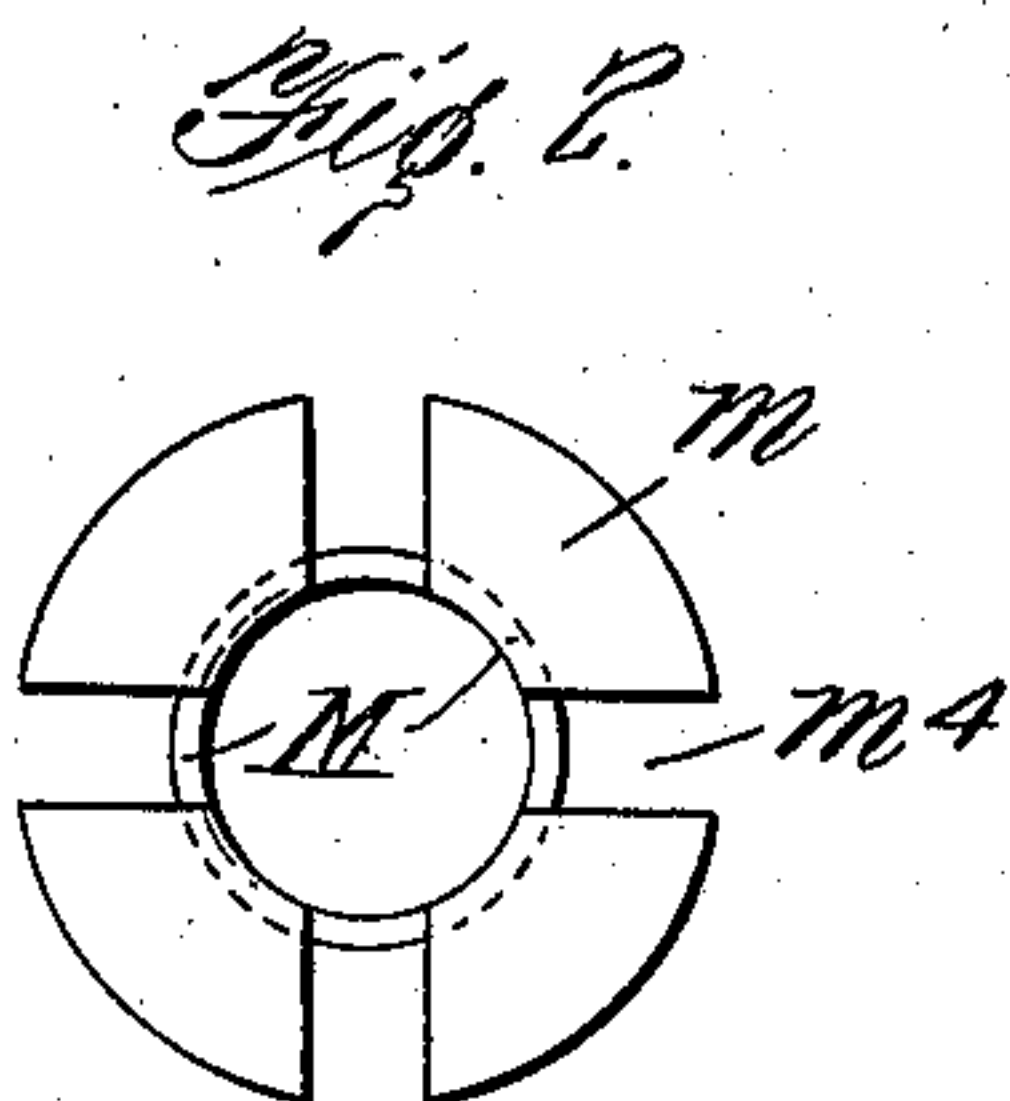
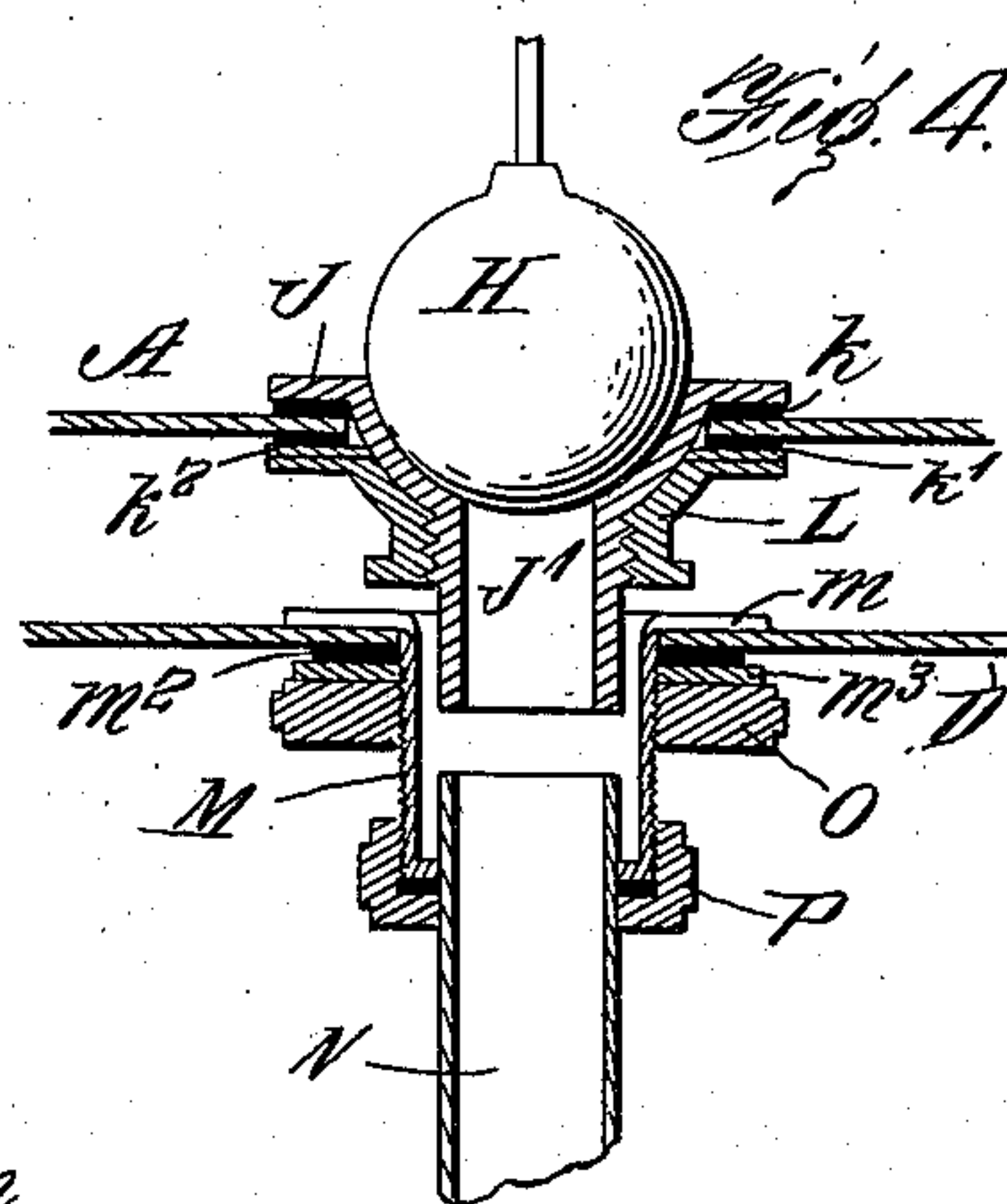
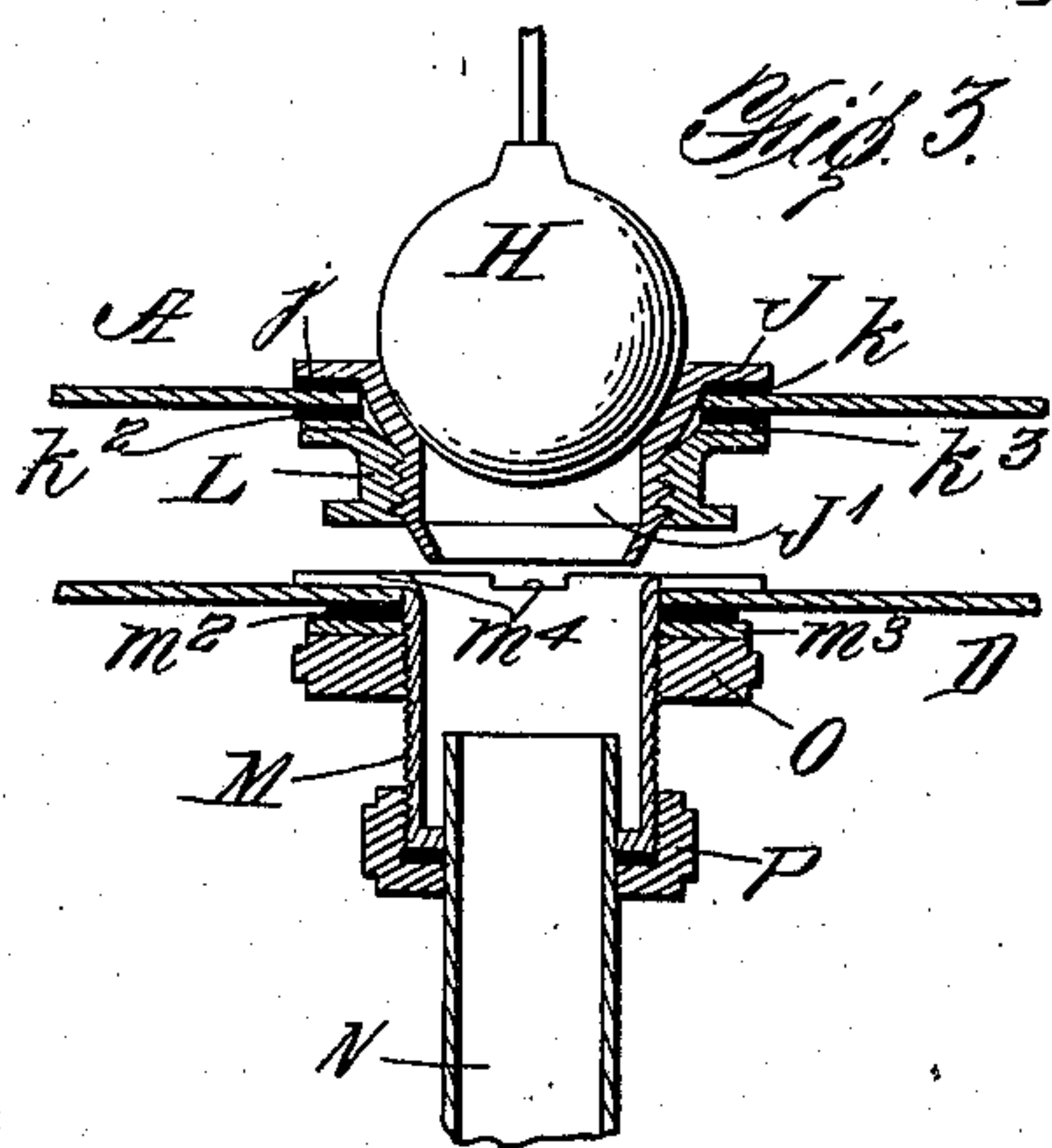
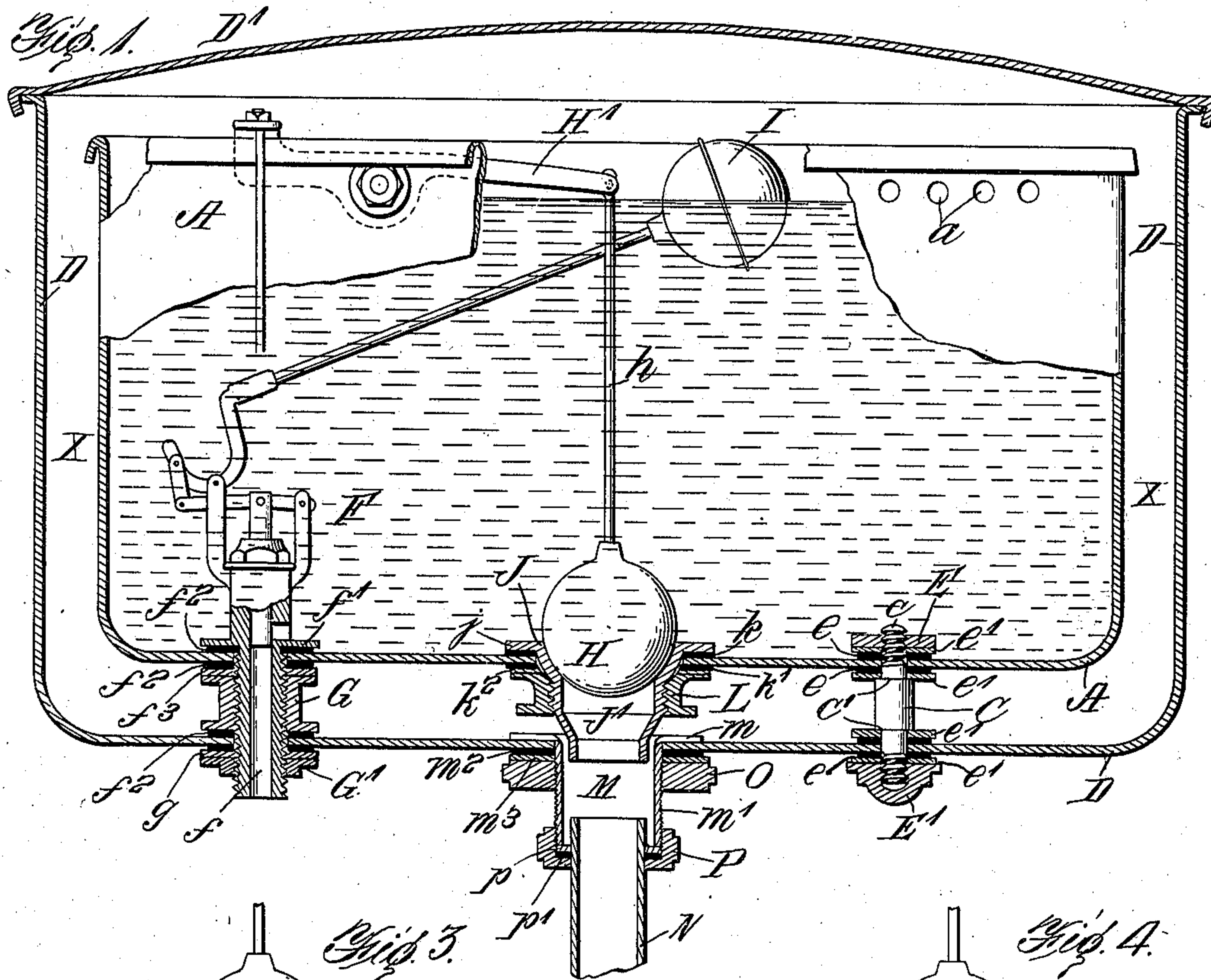


No. 848,147.

PATENTED MAR. 26, 1907.

C. WILLMS.
WATER TANK.

APPLICATION FILED JULY 30, 1906.



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UNITED STATES PATENT OFFICE.

CHARLES WILLMS, OF BALTIMORE, MARYLAND.

WATER-TANK.

No. 848,147.

Specification of Letters Patent.

Patented March 26, 1907.

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To all whom it may concern:

Be it known that I, CHARLES WILLMS, a citizen of the United States, residing in the city of Baltimore, State of Maryland, have invented certain new and useful Improvements in Water-Tanks, of which the following is a specification.

My invention relates especially to water-tanks of the class known as "flushing-tanks," and particularly to tanks of the kind shown in my prior application for patent filed March 13, 1906, in which the tank is formed of thin sheet metal and enameled and which is associated with a condensation-collector, also enameled, and receives water of condensation dripping from the tank.

The object of my invention is to simplify the construction of such tanks.

In carrying out my present invention I associate the condensation-collector with the tank in the same manner as heretofore proposed by me, and the condensation-collector is separated from the tank in such manner as to leave an air-space between the two. There is an outlet in the bottom of the tank for flush-water, and this outlet is provided with a valve-seat formed with a downwardly-projecting extension through which water is delivered into the flush-pipe. A communication is provided between the condensation-collector and the flush-pipe, whereby the collector may be drained of all water, whether water of condensation, overflow, or after-fill water. The arrangement is such that ordinarily flush-water does not pass into the collector; but should it do so it will quickly drain out from it. The valve-seat is clamped to the inner tank, and preferably clamped to the condensation-collector or outer tank is a downwardly-projecting thimble which surrounds the lower extension of the valve-seat, and the lower end of this thimble is connected by a slip-joint with the flush-pipe.

I preferably form the valve-seat and its extension from sheet metal, and the thimble may be formed in like manner.

In the accompanying drawings, Figure 1 shows a longitudinal vertical section through a flush-tank embodying my improvements. Fig. 2 is a top plan view of the upper end or head of the thimble connected to the bottom of the condensation-collector. Fig. 3 is a detail view in section, showing a modified construction. Fig. 4 is a similar view showing another modification.

The water-containing tank A is preferably formed with holes *a* at the top to provide an overflow, although these holes may be omitted, because if there is any overflow it may be over the upper edge of the tank. Holes are also formed in the bottom of the tank to accommodate the flush-valve seat and the inlet-pipe for the ball-cock. These will be hereinafter mentioned.

The condensation-collector D is in this instance shown as being formed as a jacket, completely inclosing the tank, and there is an air-space X all around the water-tank. It is preferably made from a single piece of sheet metal, such as sheet-steel, without seam, and is provided with a cover D'. There is never much water in the collector, and so the air-space prevents the occurrence of condensation on the exterior of the collector. There is no metallic connection between the upper edge of the water-containing tank and the collector, and therefore, although the water-containing tank may become very cold, the collector does not assume the same temperature on account of the air-space at all times present between the tank and the collector.

In order to hold the tank and collector a suitable distance apart, I preferably employ the devices shown in Fig. 1. On one side of the discharge-opening I provide a supporting device C, shown as consisting of a rod screw-threaded at opposite ends and having the central portion *c* shouldered at *c'*. The reduced portions of the rod extend through the bottom of the tank and the bottom of the condensation-collector. Soft washers *e* and metal washers *e'* are fitted on the reduced portions of the rod on opposite sides of the bottom of the tank, and collector and nuts E E' are employed to clamp the soft washers against the bottom of the collector and tank. The arrangement is such that the tank and collector are firmly connected with each other and are held a suitable distance apart, this distance being regulated by the shoulders *c'* on the rod. The soft washers prevent the enamel from being cracked or chipped while the nuts are being screwed home. On the opposite side of the discharge-opening of the tank the supporting devices are used in connection with the ball-cock. The ball-cock F has a threaded downwardly-projecting extension *f*, above which there is a flange *f'*, and between this flange and the bottom of the tank is arranged a

small soft washer f^2 . A space-nut G is arranged on the extension f between the tank and condensation-collector, and soft washers f^2 are interposed between the opposite ends of the nut and the bottoms of the tank and collector. A metal washer f^3 may be employed just over the nut G. Outside the collector there is another nut G', arranged on the extension f , and there is a soft washer g and a metal washer g' interposed between this nut and the bottom of the collector. In this way the ball-cock may be securely fastened in place and the devices serve to hold the tank and collector a suitable distance apart. If necessary, two or more supporting devices, such as C, may be attached at suitable places to support the tank and separate it from the collector.

I have shown a ball-valve H of well-known construction; but other forms of flush-valves may be employed. This valve H is shown as being attached to a rod h , suspended from an operating-lever H'. The ball-valve is shown as being provided with a float I of the usual kind. The valve H coöperates with a valve-seat J, arranged in the discharge-opening of the water-tank. This valve-seat instead of being cast is preferably formed from sheet metal. Preferably the seat is made by first cutting a seamless tubing into suitable lengths and then drawing these lengths into the required shape. In this way the valve-seat is lighter than if made of cast metal having the same strength, and I find that it is easier to cut threads on such sheet-metal seats, because there is not so much wear on the cutting-tools. Furthermore, valve-seats made in this way are more uniform in shape than when cast. The valve-seat is suitably formed to receive the valve, and it has a flange j extending around the outlet-opening. Between this flange and the bottom of the tank a soft washer k is preferably arranged. The flange j is thin, and therefore practically all water in the tank is discharged at each flush, and there is not the same danger of a collection of mud as would be the case if the valve-seat were raised above the bottom of the tank. The downwardly-extending projection J' of the valve-seat extends through the air-space X and preferably projects a short distance below the bottom of the condensation-collector in the manner illustrated in Fig. 1. This projection is threaded and receives a clamping-nut L, between which and the bottom of the tank is interposed a soft washer k and a metal washer k' . By means of this nut the valve-seat may be firmly connected with the tank. A thimble M is connected with the bottom of the condensation-collector. It has a flanged upper end m , surrounding the discharge-opening in the collector, and it has a downwardly-projecting portion m' , which connects with the flush-

pipe N. The projection m' is threaded and receives the soft washer m^2 and the metal washer m^3 and also the clamping-nut O. By these devices the thimble may be firmly connected with the condensation-collector. Preferably the flange m is recessed or cut away at m^4 in the manner illustrated in Fig. 2, so that every particle of water may be readily drained from the condensation-collector. The flush-pipe M is preferably connected with the thimble by the slip-joint P.

It will be observed that the lower end of the thimble is formed with an inwardly-projecting annular flange p . This is for the purpose of providing a bearing for the soft washer p' of the slip-joint. Without such a flange the edge would be so sharp as to cut the washer.

It will be observed that there is an opening into the thimble M all around the projection J', and the arrangement is such that when the valve H is opened the flush-water will rush into the flush-pipe N without passing into the condensation-collector. The flush-pipe is always in communication with the condensation-collector, so that the collector is always kept drained of any water that it receives. Should any flush-water pass into the collector, it will quickly discharge therefrom. Under no circumstances can it remain therein any considerable length of time.

Fig. 3 shows a slight modification. In this case the projection J' does not extend below the bottom of the condensation-collector; otherwise the construction is similar to that shown in Fig. 1.

In Fig. 4 the extension J' instead of being tapered, as in Fig. 1, is made straight.

In each case the valve-seat is provided with an extension through which the flush-water is discharged into the flush-pipe, and there is a communication at all times between the condensation-collector and said flush-pipe.

I claim as my invention—

1. The combination of a water-containing tank, a condensation-collector surrounding it but leaving a clear air-space between the condensation-collector and the tank both at the bottom and at the sides, devices clamped to the bottom of the tank and to the bottom of the condensation-collector for supporting the tank rigidly within the collector and for holding it a suitable distance therefrom to provide said air-space, a flush-pipe communicating with the condensation-collector, and a valve-seat clamped to the bottom of the tank and having a downwardly-projecting extension passing into the space between the tank and the collector and discharging into the flush-pipe.

2. The combination of a water-containing tank, a condensation-collector surrounding it but leaving a clear air-space between the condensation-collector and the tank both at

the bottom and at the sides, devices clamped to the bottom of the tank and to the bottom of the condensation-collector for supporting the tank rigidly within the collector and for
 5 holding it a suitable distance therefrom to provide said air-space, a thimble clamped to the bottom of the condensation-collector and receiving water therefrom, a flush-pipe clamped to the thimble, and a valve-seat
 10 clamped to the bottom of the tank and having a downwardly-projecting extension passing into the space between the tank and the collector and discharging into the flush-pipe.

3. The combination of a flush-tank, a condensation-collector associated therewith, supporting devices for holding the tank and collector a suitable distance apart, devices for clamping these devices to both the tank and collector, a valve-seat clamped to the
 20 bottom of the tank between the supporting devices, a flush-pipe receiving water discharged through the valve-seat, a thimble arranged in a line with the axis of the valve-seat, devices for clamping the thimble to the
 25 collector and devices for clamping the thimble to the flush-pipe.

4. The combination of a flush-tank, a condensation-collector associated therewith, a supporting device for holding the tank and
 30 collector a suitable distance apart, means for clamping said supporting device to both the tank and the collector, a valve-seat clamped to the bottom of the tank, a flush-pipe receiving water through the valve-seat, and

means for draining water from the condensation-collector. 35

5. The combination of a flush-tank, a condensation-collector associated therewith, a supporting device for holding the tank and collector a suitable distance apart, means for
 40 clamping this device to both the tank and the collector, an inlet-valve clamped to both the tank and the collector and carrying devices between the bottom of the tank and the bottom of the collector for holding them a
 45 suitable distance apart, a valve-seat clamped to the bottom of the tank, a flush-pipe receiving water discharged through the valve-seat and means for draining water from the condensation-collector. 50

6. The combination of a flush-tank, a condensation-collector surrounding it with an air-space between its bottom and the bottom of the tank, a drawn sheet-metal valve-seat clamped to the bottom of the tank, a drawn
 55 sheet-metal thimble having a flange inside the collector slotted or recessed down to the bottom surface of the condensation-collector, a nut on the thimble for clamping it to the tank, and a flush-pipe clamped to the
 60 thimble.

In testimony whereof I have hereunto subscribed my name.

CHAS. WILLMS.

Witnesses:

WM. F. BEVAN,

T. ALAN GOLDSBOROUGH.