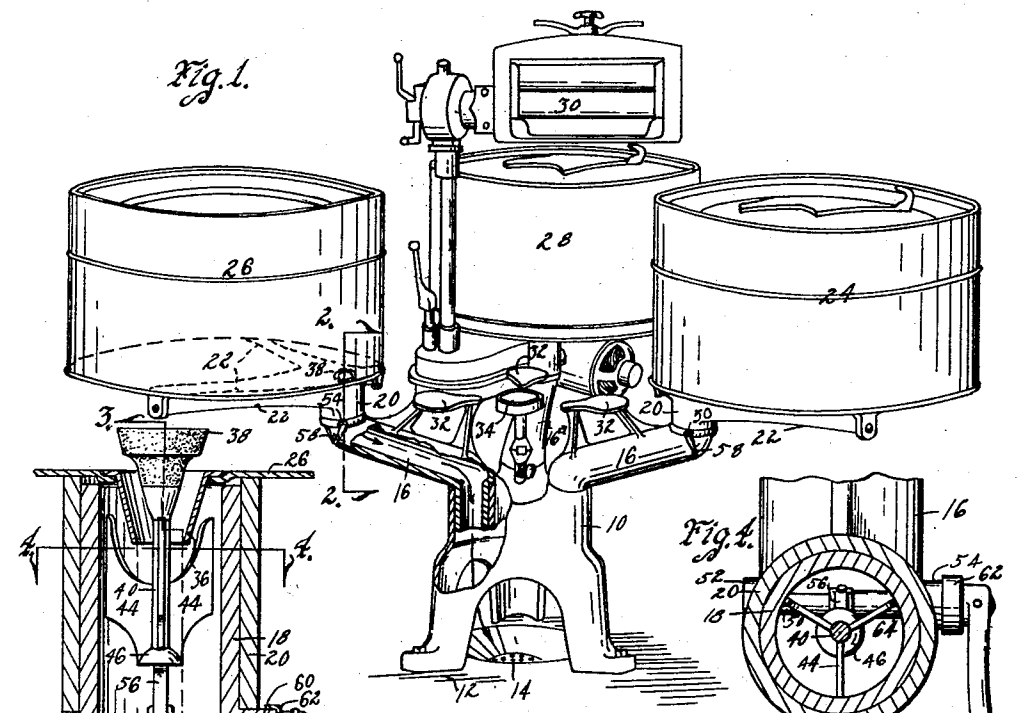
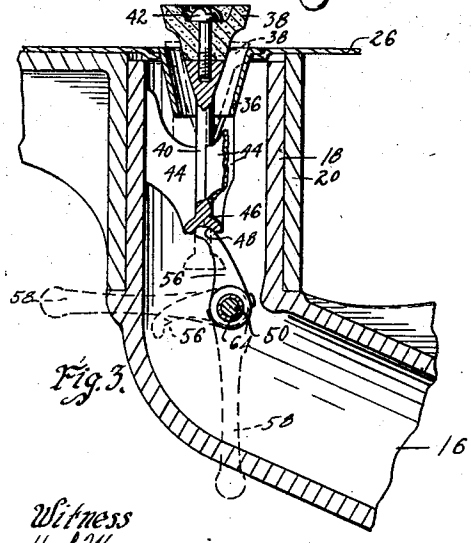
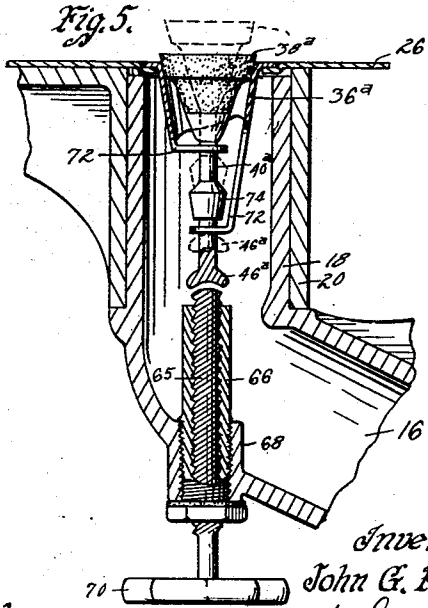
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DRAIN VALVE STRUCTURE

Filed May 21, 1930







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DRAIN VALVE STRUCTURE

Application filed May 21, 1930. Serial No. 454,361.

The object of my invention is to provide a drain valve structure which is simple, durable and comparatively inexpensive to manufacture.

A further object of my invention is to provide an easily and quickly operable drain or dump valve for a washing machine tub or the like whereby the valve may be conveniently opened without having to reach into the water of the tub for withdrawing a stopper or the like and yet a fast flow of liquid is possible.

Still a further object is to provide a valve structure especially adapted for use with a laundry appliance of the type shown in my co-pending application, Serial Number 304,895, filed September 10, 1928.

Another object is to provide a valve structure for a rotatable tub from which water is discharged into a receiver pipe, the tub rotating about the axis of the receiver pipe and the parts of the valve being so arranged that the valve may be opened regardless of the position to which the tub may be rotated.

With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of a laundry appliance to which my improved drain valve structure may be applied.

Figure 2 is an enlarged sectional view on the line 2—2 of Figure 1 showing the parts of the valve in detail.

Figure 3 is a sectional view on the line 3—3 of Figure 2.

Figure 4 is a sectional view on the line 4—4 of Figure 2 and

Figure 5 is a sectional view similar to Figure 3 illustrating a slightly modified form of drain valve structure.

On the accompanying drawings, I have used the reference numeral 10 to indicate a base which may be bolted or otherwise secured to a floor 12 over a drain 14. The base 10 has associated therewith a pair of arms 16 which are swingably mounted relative to the base.

The arms 16 have upstanding receiver pipes 18 on their outer ends on which the hubs 20 of spiders 22 are rotatably mounted. The spiders 22 are adapted for supporting rinse and blueing tubs 24 and 26. An arm 16*a* supports a washing machine 28. In using such a laundry appliance, the arms 16 may be swung relative to the base 10 and the tubs 24 and 26 may be rotated about the receiver pipes 18 for the purpose of placing the tubs in such position so that clothes can be wrung through a wringer 30 on the washing machine 28 into the tub 24 and then from the tub 24 through the wringer 30 into the tub 26. The clothing is then wrung from the tub 26 through the wringer 30 into a basket supported on plates 32. The tubs 24 and 26 may also be swung into position over a burner 34 for heating water in the tubs.

In such an appliance it is desirable to discharge water from the tubs 24 and 26 into the receiver pipes 18 and since the tubs can be swung relative to the supporting arms 16 as just described, it will be obvious that a valve structure such as I will now describe must be operable regardless of any position to which the tubs might be swung.

My drain valve structure comprises a liquid discharge neck 36 on the bottom of the tub 24 and one on the bottom of the tub 26. I will proceed to describe the one on the tub 26, the other one being identical therewith.

A stopper 38 formed of rubber or other suitable material is adapted for coaction with the discharge neck 36 and is secured to a stem 40 by means of a screw 42 or the like. The stem 40 extends down through the discharge neck 36 and into the receiver pipe 18. It is guided relative thereto by means of fins 44.

The lower end of the stem 40 is provided with a head 46 having a centrally located depression 48.

A rock shaft 50 is journalled in hubs 52 and 54 formed on the supporting arm 16.

A cam 56 is secured to the shaft 50 within the receiver pipe 18 which is adapted to coact with the head 46 for exerting an upward thrust on the stem 40 for moving the stopper 38 to an open position, as shown by full lines in Figures 2 and 3. The depression 48 is sufficiently deep to prevent the weight of the handle 58 from swinging the cam 56 to a lowered position when the stopper 38 is open.

When the handle 58 is then moved to a closed position, the shaft imparts a slight raising motion to the stopper 38 to disengage the end of the cam 56 from the depression 48 whereupon further movement of the handle 58 lowers the stopper to closed position.

When the cam is thus lowered to the dotted line position shown in Figure 3, the stopper 38, due to its weight, the weight of the stem 40, the fins 44 and the head 46 will assume a closed or seated position. The pressure of any liquid in the tub 26 will also serve to maintain it seated. It will be noted that it is of tapered shape and that the discharge neck 36 is likewise tapered, this being the most effective shape for proper seating of a stopper of this character.

For selectively rocking the shaft 50 for opening or closing the stopper 38, I provide a handle 58 mounted outside of the arm 16. Packing 60 may be provided in the hub 54 and may be retained in position by a cap 62 and the handle 58, if found desirable. A sleeve 64 prevents outward movement of the handle 58. The shaft 50 is dead-ended in the hub 52 and consequently there will be no leakage at this point.

A valve of this character is easily and quickly manipulated from outside of the tub 26. Instead of providing a handle 58, a rock shaft 50 and a cam 56, other means may be provided for raising the stopper 38 to open position such as a screw 65 as illustrated in Figure 5.

In this construction, the screw 65 is threaded in a sleeve 66, the threads being of high pitch. The sleeve 66 is mounted in a boss 68 and a hand wheel 70 is provided on the screw 65 for rotating it.

I have shown a slightly different way of slidably mounting the stem 40*a* of the stopper 38*a* shown in Figure 5, which consists in forming a pair of perforated bracket ears 72 on the lower end of the discharge neck 36*a* instead of using fins, as shown in Figures 2, 3 and 4. In this type of valve, if the weight of the head 46*a* is found insufficient, an additional weight 74 may be placed on the stem 40. Either type of valve illustrated may be opened regardless of the position of the tubs 24 and 26.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified form of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a drain valve structure, a liquid discharge neck, a receiver pipe therebelow, a stopper for said liquid discharge neck, a stem on said stopper extending into said receiver pipe, means for guiding said stem, and means carried by the receiver pipe for exerting an upward thrust on the stopper to unseat it from said liquid discharge neck, said means comprising a rock shaft and a cam, said stem having a head thereon with which said cam coacts, said head having a depression to coact with the cam to retain the stopper in open position.

2. For use with a tub and a receiver pipe therebelow, said tub being rotatable about the axis of the receiver pipe and having a drain discharge neck extending into the pipe, a stopper for said liquid discharge neck, a stem on said stopper extending into said receiver pipe and means for exerting an upward thrust on the stopper to unseat it from said liquid discharge neck.

3. For use with a tub and a receiver pipe therebelow, said tub being rotatable about the axis of the receiver pipe and having a drain discharge neck extending into the pipe, a stopper for said liquid discharge neck, a stem on said stopper extending into said receiver pipe, means for guiding said stem, and means carried by the receiver pipe for exerting an upward thrust on the stopper to unseat it from said liquid discharge neck.

4. For use with a tub and a receiver pipe therebelow, said tub being rotatable about the axis of the receiver pipe and having a drain discharge neck extending into the pipe, a stopper for said liquid discharge neck, a stem on said stopper extending into said receiver pipe, and means carried by the receiver pipe for exerting an upward thrust on the stopper to unseat it from said liquid discharge neck, said means comprising a shaft, a cam thereon for engaging said stem and a handle on the shaft.

5. For use with a tub and a receiver pipe therebelow, said tub being rotatable about the axis of the receiver pipe and having a drain discharge neck extending into the pipe, a stopper for said liquid discharge neck, a stem on said stopper extending into said receiver pipe, and means carried by the receiver pipe for exerting an upward thrust on the stopper to unseat it from said liquid discharge neck, said means comprising a shaft, a cam thereon for engaging said stem and a handle on the shaft, said stem having a head thereon, with which said cam coacts, said head having a depression to coact with the cam to retain the stopper in open position.

6. For use with a tub and a receiver pipe

therebelow, said tub being rotatable about the axis of the receiver pipe and having a drain discharge neck extending into the pipe, a stopper for said liquid discharge neck, a stem on said stopper extending into said receiver pipe, a head on the lower end of said stem, a shaft carried by the receiver pipe, a cam on said shaft for coacting with said head for moving the stopper to open position regardless of the position of rotation of the tub relative to the receiver pipe.

7. For use with a tub and a receiver pipe therebelow, said tub being rotatable about the axis of the receiver pipe and having a liquid discharge neck extending into the pipe, a stopper for said liquid discharge neck, a stem on said stopper extending into said receiver and screw threaded means for exerting an upward thrust on the stopper to unseat it from said liquid discharge neck.

Des Moines, Iowa, May 1, 1930.

JOHN G. FEHN.