

[72] Inventor **Everett R. Seck**
Rockville, Md.
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 [73] Assignee **Wayne Musgrove**
Hyattsville, Md.
a part interest

1,494,708	5/1924	Reznicek	137;4/93;67
1,589,353	6/1926	Bock et al.	137;4/139;249 X
1,614,346	1/1927	Coret	4/249
1,740,860	12/1929	Hansen	4/108
1,864,827	6/1932	Jenkins et al.	4;4/249;69 UX
2,713,954	7/1955	Spenner	222;4/179;249 X
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FOREIGN PATENTS

278,270	10/1967	Australia	4/249
1,020,553	2/1966	Great Britain	4/108
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Primary Examiner—Laverne D. Geiger
Assistant Examiner—Donald B. Massenberg
Attorney—B. P. Fishburne, Jr.

[54] FLUSH VALVE OPERATING MECHANISM

10 Claims, 2 Drawing Figs.

[52] U.S. Cl. 4/108
 [51] Int. Cl. E03d 13/00
 [50] Field of Search 4/67, 52,
 108, 249

[56] References Cited

UNITED STATES PATENTS

653,437	7/1900	Burger et al.	4/108 X
1,226,716	5/1917	Staszak	4/108
1,483,939	2/1924	Jaeger	4/108

ABSTRACT: A foot-operated attachment mechanism or "kit" for converting hand-operated urinal flush valves to remote foot pedal operated valves. The attachment is characterized by simplicity and ease of installation on newly installed or existing fixtures. The construction is economical, rugged and durable and offers the advantage of sanitation and lessening the spreading of disease transmitted by the hands.

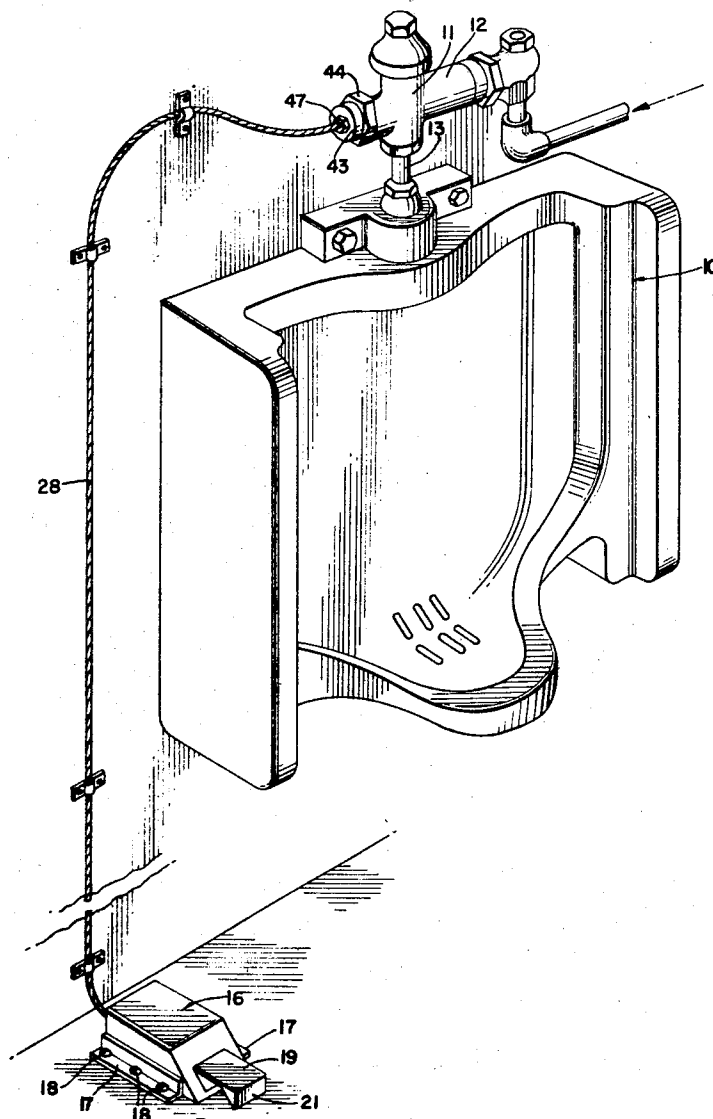
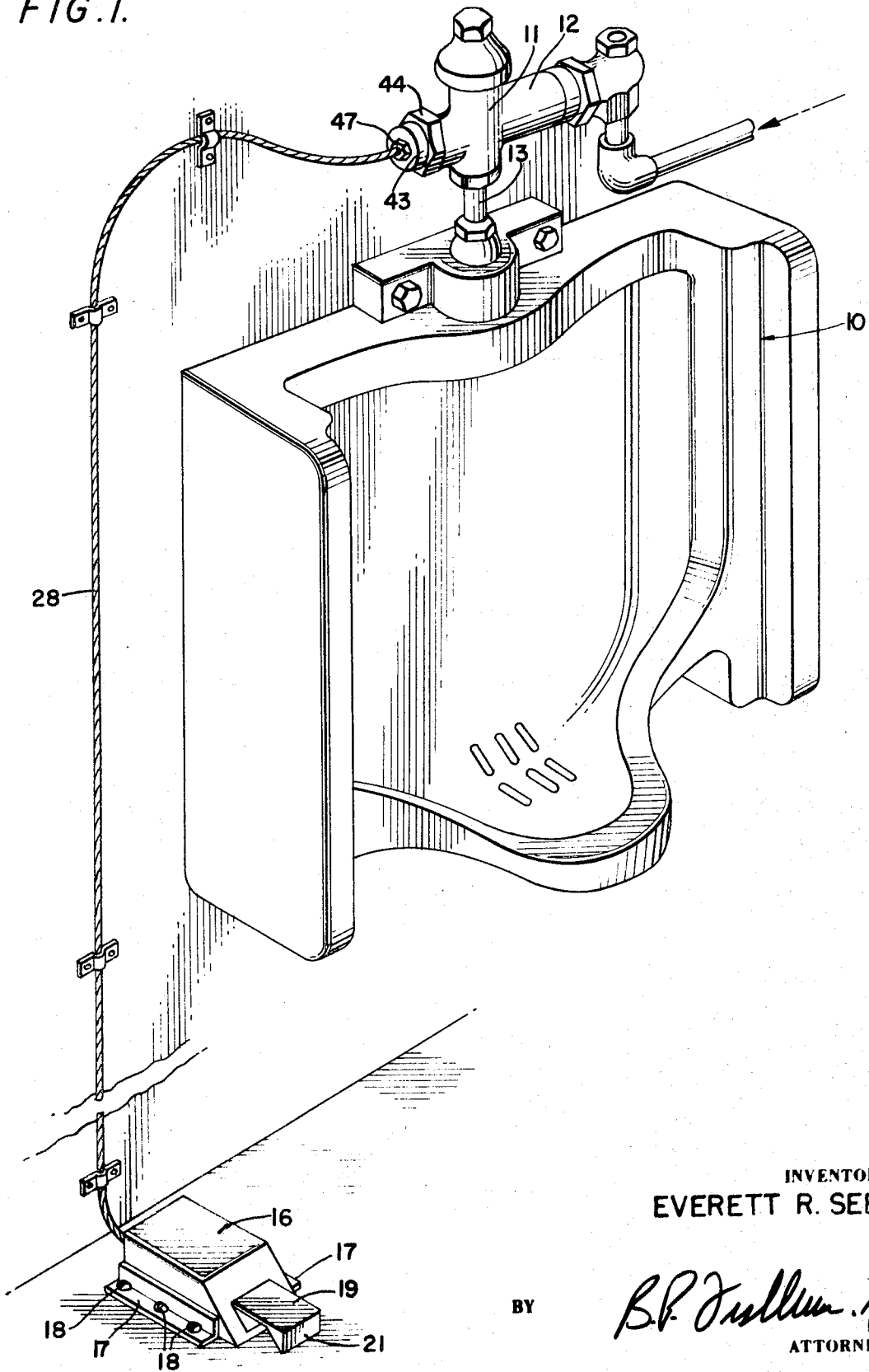


FIG. 1.

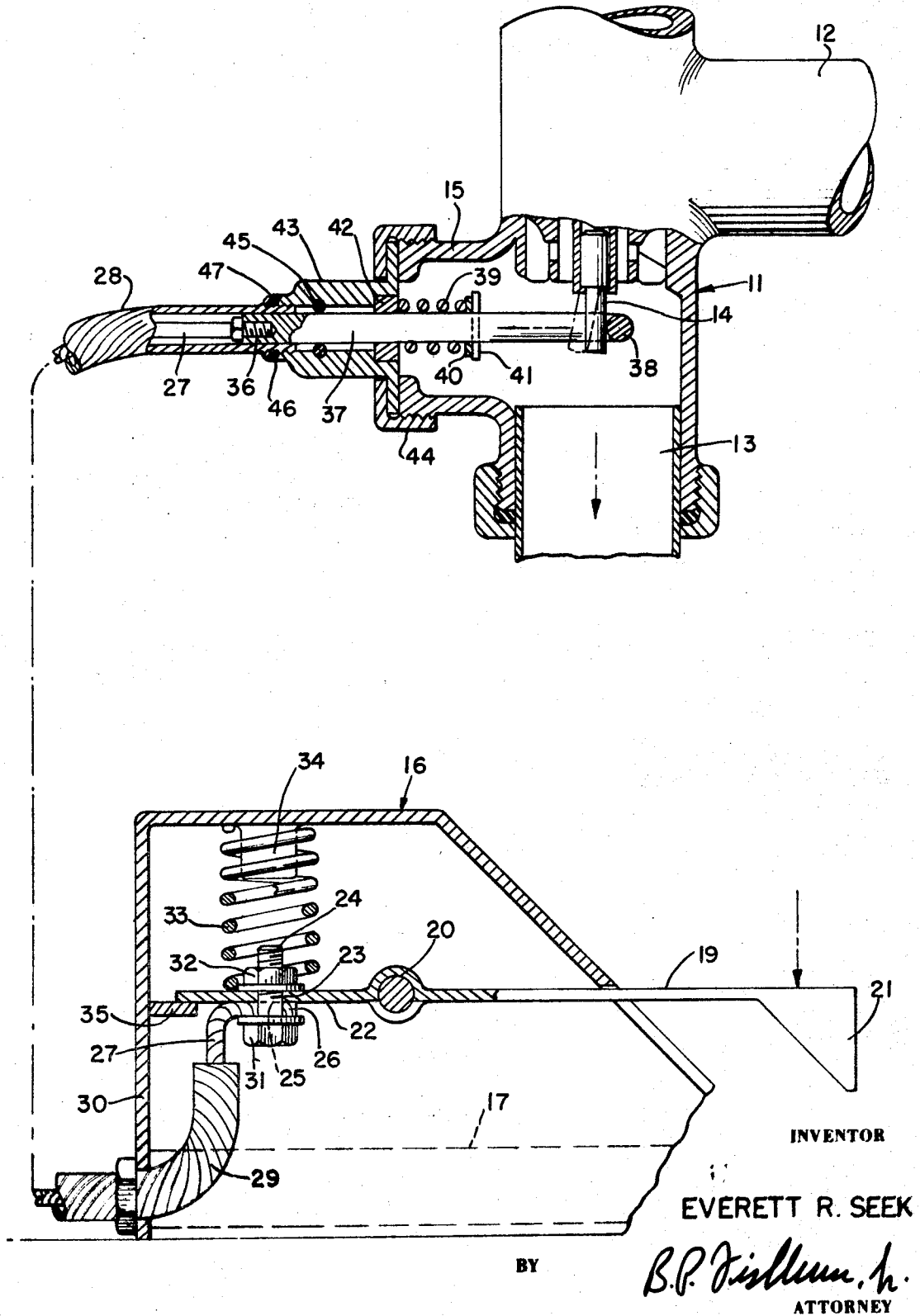


INVENTOR
EVERETT R. SEEK

BY

B.P. Jullian, Jr.
ATTORNEY

FIG. 2.



FLUSH VALVE OPERATING MECHANISM

BACKGROUND OF THE INVENTION

Foot-operated flushing means for urinals are known in the prior art but none of these prior art devices has been totally acceptable for a variety of reasons. Some such devices require the installation of additional piping or valve means inside of building walls or the defacing of walls or floors for mounting the control components. Also, in general, the prior art devices have tended to be awkward and unduly complicated and noneconomical and for these reasons have not been widely accepted. Some examples of the prior art teachings are in U.S. Pat. Nos. 1,483,939; 1,740,860; 653,437; and 1,226,716.

It is the aim of this invention to provide a completely practical, reliable and economical flush valve operating mechanism which is in the nature of an attachment kit, applicable to substantially any conventional urinal flush valve by simply removing the handle operator and very simply attaching a push-pull cable operator to the valve which is controlled by a foot pedal on the floor adjacent to the urinal. The attachment or mechanism is entirely exterior of the wall upon which the urinal is mounted and requires no cutting of the wall or floor and no installation of additional pipes, valves or the like. The invention has obvious sanitary advantages, is neat and compact, and is virtually indestructible after long, continuous usage. Other objects and advantages of the invention will be apparent to those skilled in the art during the course of the following description.

BRIEF DESCRIPTION OF DRAWING FIGURES

FIG. 1 is a perspective view of a urinal and the foot-operated flush valve operating mechanism or attachment embodying the invention.

FIG. 2 is an enlarged fragmentary vertical section through the mechanism and flush valve, parts broken away.

DETAILED DESCRIPTION

Referring to the drawings in detail wherein like numerals designate like parts, the numeral 10 designates a conventional wall-mounted urinal having a top mounted flush valve 11 of the general type shown in U.S. Pat. No. 2,633,141, such valves being commonly known as Sloan valves.

Referring to FIG. 2, the valve 11 has an inlet pipe branch 12 to admit water under pressure and a depending water outlet pipe 13 leading to the urinal 10. The release of flushing water is under control of an internal tiltable stem element 14 commonly operated by a handle means on a lateral branch extension or sleeve 15 of the valve body. In the present invention, the handle operating means is removed and discarded and the foot-operated mechanism in the form of an attachment kit replaces the handle.

The invention proper comprises a floor-mounted pedal support and housing 16 formed of stainless steel or the like arranged adjacent one side of the urinal 10 and securely anchored to the floor by a pair of side angle bars 17 and a suitable number of anchor screws 18, as shown. The boxlike support 16 partially encloses a foot pedal 19, securely mounted between its ends on a horizontal transverse rocker shaft 20 within the support 16 and suitably journaled thereon. The pedal 19 projects forwardly of the support 16 and preferably has a depending floor-engaging limit stop 21 thereon.

On the interior side of the rocker shaft 20, a relatively short extension 22 of the foot pedal has an opening 23 receiving a bolt 24 which is drilled to provide a transverse opening 25 therein receiving the terminal end 26 of a push-pull flexible cable operator or actuator 27. The cable 27 slides through a substantially rigid guide sheathing 28 and the general construction and mode of operation of push-pull actuating cables is well known and need not be dealt with in great detail. At its lower terminus the guide sheathing 28 has an upturned elbow

portion 29 fixedly anchored within a sidewall opening of the support 16 at the rear sidewall 30 of the support. The push-pull cable emerges from the top of this elbow and has its terminal end 26 placed through the opening 25 of bolt 24 and is securely clamped by the bolt head 31 against the bottom face of the foot pedal. The bolt is secured above the foot pedal by a nut 32 which serves the dual purpose of clamping the end of the push-pull cable on the underside of the foot pedal and centering the lower end of a vertical foot pedal return coil spring 33 on the upper side of the pedal within the housing 16 and toward the back of the housing. The top of this spring is stabilized by a dependent fixed lug 34 on the top wall of the housing or support. A pedal stop element 35 is preferably provided on the rear wall 30 to limit the return movement of the foot pedal at a level position when the foot is removed.

At its upper end adjacent the flush valve 11, the push-pull cable actuator 27 is firmly anchored as at 36 to a rigid reciprocatory rod 37 having an eye or loop 38 inside of the valve body receiving the stem element 14. The rod 37 is urged to a valve closing position where the stem 14 is vertical by a coil spring 39 having one end bearing on a flat washer 40 which in turn engages a cross pin 41 in the rod 37. The other end of the spring 39 rests on a bearing element 42 recessed into a cap 43, the bearing element 42 also serving to guide the rod 37 as the latter reciprocates. The cap 43 is clamped to the valve body extension 15 by a nut 44 which may be a standard component of the flush valve. A water tight seal around the rod 37 is provided by a light pressure O-ring 45 within the cap. Only a sufficient seal is required to exclude the passage of splash water through the bore of the cap 43. The upper terminal end of the cable guide or sheathing 28 preferably has a screw-threaded connection at 46 with the cap 43 and is secured by a lock nut 47.

In operation, when it is desired to flush the fixture, the foot pedal 19 is depressed with the foot and the spring 33 yields and the lower terminal end of the cable 27 is pulled upwardly through the guide elbow 29. This simultaneously causes the rod 37 to be pulled axially outwardly compressing the spring 39 and tilting the stem element 14, as shown in dotted lines to release the water for flushing. When the foot is removed from the pedal, the two springs 39 and 33 return the elements 37 and 19 to their normal positions and this completes the operation of the device.

The mechanism is virtually foolproof, very easy to install, and requires practically no maintenance. Its use avoids the necessity for the hands touching fixtures in public accommodations and the like and therefore prevents the spread of disease.

The invention mechanism is equally well adapted for use with certain commodes equipped with hand-operated flush valves and other like plumbing fixtures. These commodes are frequently abused and caused to leak around the flushing handle when the user frequently kicks the handle with the foot. The attachment mechanism of the invention will completely eliminate this problem.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or scope of the subjoined claims.

I claim:

1. A urinal flush valve operating mechanism comprising in combination with a flush valve having a tiltable stem element and lateral branch sleeve adjacent the stem element, a rod having a connection with the stem element to tilt the same when the rod is reciprocated, bearing support means on said branch sleeve supporting the rod for reciprocation, a return spring connected with the rod and urging it to a flush valve closing position such that the stem element is untilted, a push-pull cable actuator connected with the rod and extending remotely from the valve, a floor-mounted support, a foot pedal pivotally mounted upon the support and having a con-

nection with said cable actuator, a tubular guide for the cable actuator connected with said bearing support means and said support near its opposite ends, and resilient means connected with the foot pedal to return it to a operative position when pressure is removed therefrom.

2. The structure as defined in claim 1, and said bearing support means comprising a substantially rigid bearing element having a bore slidably receiving said rod, a cap element on said lateral branch sleeve containing said bearing element and having an enlarged bore, and an annular sealing ring within the bore of the cap element sealingly engaging the rod.

3. The structure as defined in claim 2, and said return spring being a coil spring surrounding the rod within said branch sleeve and having one end engaging said rigid bearing element, and an abutment element on the rod engaging the other end of said spring.

4. The structure as defined in claim 3, and said rod having a loop on its leading end receiving the tiltable stem element therethrough.

5. The structure as defined in claim 1, and said floor-mounted support being a boxlike support and the pivot for said foot pedal being inside of the boxlike support with a portion of the foot pedal projecting exteriorly of the support, the support having a wall opening receiving the pedal movably.

6. The structure as defined in claim 1, and said tubular guide for the cable actuator having an elbow terminal directed upwardly within the support below the foot pedal and spaced from one side of the foot pedal pivot, a bolt engaging through an opening of the foot pedal on said one side of the foot pedal pivot, said bolt having a transverse opening receiving the lower terminal end of said cable actuator, a nut on the bolt

above the foot pedal and serving to clamp said terminal end between the bolt and the lower surface of the foot pedal, and a return coil spring engaging over the top of the bolt and nut and resting on the foot pedal and receiving in its upper end a centering lug which is secured to said support.

7. The structure as defined by claim 6, and a stop element on said support engageable with the bottom of the foot pedal to positively limit return movement thereof by said coil spring.

8. The structure as defined by claim 7, and a depending stop element on the leading end of the foot pedal engageable with the floor on which the support is mounted to limit depressing of the foot pedal.

9. A foot-operated plumbing fixture flush valve operating attachment comprising a support securely anchored to a floor adjacent the fixture, a foot pedal pivoted to the support for vertical swinging movement thereon, a return spring and return limit stop means for the foot pedal on the support, a flexible cable actuator operating a fixture flush valve extending remotely from the support and pedal and adapted for connection with the flush valve of the fixture, said cable actuator having a tubular guide sheathing connected with the support, and a securing means anchoring one terminal end of the cable actuator to the foot pedal on one side of the foot pedal pivot.

10. The structure as defined in claim 9, and said securing means comprising a bolt engageable through an opening in the foot pedal and having a transverse through opening receiving said terminal end of the cable actuator so that the terminal end may be locked securely against one face of the foot pedal, and a nut on said bolt at the opposite face of the foot pedal.

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