Sept. 25, 1962 M. H. SILVERMAN 3,055,015

RELEASABLE HINGE ASSEMBLY

Filed July 25, 1960

FIG.1.

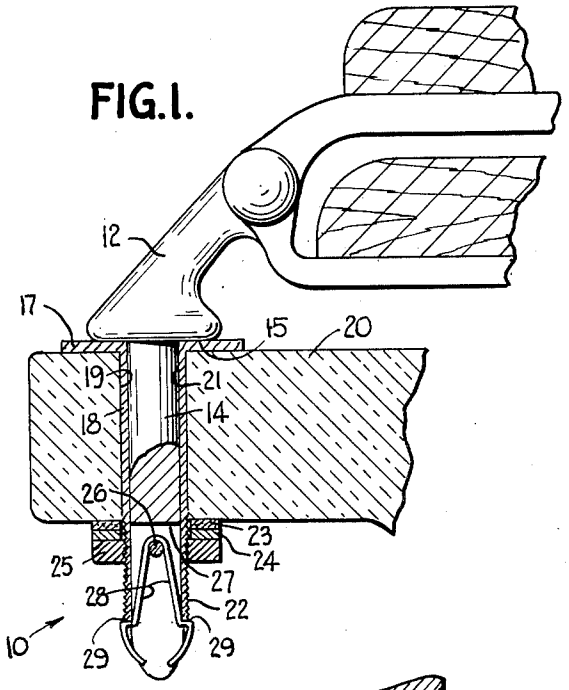
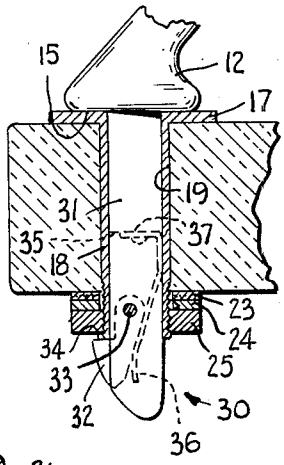


FIG.3.



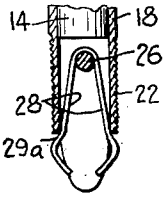


FIG.7.

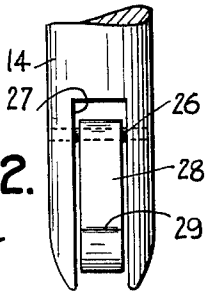


FIG.2.

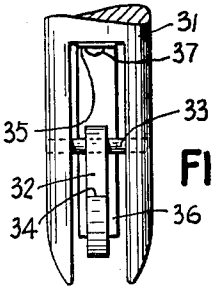


FIG.4.

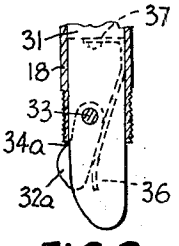


FIG.8.

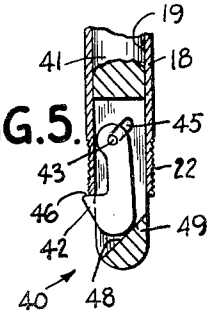


FIG.5.

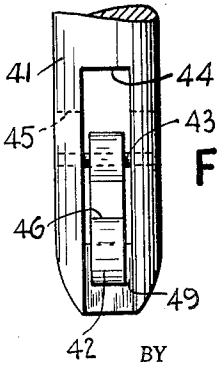


FIG.6.

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RELEASABLE HINGE ASSEMBLY

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This invention relates to plumbing fixtures and, more particularly, to a hinge assembly for toilet bowl seats and covers.

Ordinarily, a seat and cover are secured to a toilet bowl by means of a hinge unit which must be independently threadedly secured to a mounting flange of the toilet bowl. The use of such threaded type fasteners is not only time consuming and inconvenient during the initial installation of the toilet bowl and seat and cover assembly, but is equally as inconvenient when replacements must be made. In order to install a new or replacement seat upon a bowl, the home owner, plumber, or the like, must kneel down, often in congested areas, and tediously assemble the washers to the mounting posts of the hinge units, and hold them on with one hand while attempting to run the nut up with the other hand. Once the nut has been started upon the post, it must then be tightened with a wrench, which is often very slow and laborious since the space is usually restricted, thus making the use of such wrench inconvenient. In various types of commercial, industrial, and medical institutions, it is also necessary to thoroughly clean the toilet bowls, seats, and covers quite frequently in order to meet sanitation requirements, and such is usually quite difficult with the seat and cover assemblies mounted upon the toilet bowl. It is, therefore, an object of the present invention to provide a hinge assembly for mounting seats and covers upon toilet bowls that is extremely simple in construction, efficient in operation, and which will overcome all of the aforementioned difficulties.

Another object of the present invention is to provide a hinge assembly for toilet seats and covers which will not only facilitate the installation and replacement of such toilet seats and covers, but which will also enable the toilet seat and cover of each toilet bowl to be conveniently removed and remounted whenever desired for cleaning purposes, with a minimum amount of time and effort.

Still an additional object of the present invention is to provide a toilet seat and cover hinge assembly employing mounting posts that are detachably secured to the mounting flange of the toilet bowl by retractable detents which may be released with a slight manual pressure to allow the removal and replacement of the toilet seat and cover hinge assembly whenever required and without the use of special tools or equipment.

All of the foregoing and still further objects and advantages of this invention will become apparent from a study of the following specification, taken in connection with the accompanying drawing, wherein:

FIG. 1 is a fragmentary longitudinal cross-sectional view of a hinge assembly made in accordance with one form of the present invention in operative use.

FIG. 2 is an enlarged fragmentary side elevational view of certain parts of the assembly shown in FIG. 1.

FIG. 3 is a view similar to FIG. 1, showing a slightly modified form of construction.

FIG. 4 is an enlarged fragmentary side elevational view of certain parts of the device shown in FIG. 3.

FIG. 5 is a view similar to FIGS. 1 and 3, illustrating still another form of the present invention.

FIG. 6 is an enlarged fragmentary side elevational view of certain parts of the assembly shown in FIG. 5.

FIGS. 7 and 8 are fragmentary sectional views showing a modification of the latch members shown in FIGS. 1 and 3, respectively.

Referring now more in detail to the drawing, and more

particularly to FIGS. 1 and 2 thereof, a hinge assembly 10 made in accordance with one form of the present invention is shown to include a main mounting member 12 to which the toilet seat and/or cover may be pivotally secured. This main body member 12 has a downwardly facing shoulder 15 from which a depending post 14 projects. The shoulder 15 of the main body member 12 normally overlies a circular flange 17 of a bushing or sleeve member 18 which is secured within and serves as a liner for a pre-formed opening 19 in the mounting flange 20 of a toilet bowl.

Ordinarily, a pair of the hinge assemblies 10 are mounted upon each toilet bowl mounting flange 20, in laterally spaced apart relationship for pivotally supporting the opposite ends of a swivel shaft upon which the toilet seat and/or cover are mounted. The sleeves 18 may, therefore, be installed at the time of manufacture of the toilet bowl, such as by fabric and metal washers 23, 24, and a nut 25, which is threadedly carried upon the lowermost end of the sleeve 18, and which may be tightened up against the bottom of the mounting flange 20. The mounting post 14 is slidably supported within the longitudinal bore 21 of the sleeve 18 and has one outer end which extends outwardly from the adjacent end of the sleeve 18. This outermost end of the mounting post is further provided with a slot 27 within which a latch element is mounted upon a transversely extending pin 26.

The latch element of the embodiment illustrated in FIGS. 1 and 2 comprises a pair of spring arms 28 having a pair of detents with upwardly facing abutment surfaces 29 which normally project outwardly from the outline of the post 14 and confront the downwardly facing terminal portion of the sleeve 18, to thus lock the mounting post 14 against upward movement with respect to the mounting flange 20 of the toilet bowl. The lowermost surfaces of the spring arms 28 are curved so as to be urged inwardly during the installation of the mounting post 14, but which must be manually depressed in order to remove the mounting post 14 from the sleeve 18. It will thus be recognized that by simply depressing the free ends of the latch arms 18 of both posts of the seat and cover assembly, such seat and cover assembly may be conveniently removed from the toilet bowl whenever required, without disturbing the mounting sleeve 18 and associated parts thereof.

It will also be recognized that, aside from providing an abutment for engagement by the detents 29 of the latch element 28, the liner sleeve 18 protects the fragile finish of the toilet bowl mounting flange 20 from chipping, scratching, and the like, during the installation and removal of the hinge assemblies. Therefore, the sleeve 18 and associated flange 17 serve to insulate the toilet bowl from the movable parts of the hinge assembly at all times.

Referring now to FIGS. 3 and 4 of the drawing, a slightly modified form of construction 30 is shown wherein the mounting post 31 is similarly provided with a slot 35 adjacent to the lowermost end thereof, within which a latch member 32 is pivotally supported by means of a transversely extending pivot pin 33. This latch member 32 is also provided with a detent having an upwardly facing abutment surface 34 which normally confronts the terminal portion of the sleeve 18 and prevents withdrawal of the mounting post 31 therefrom. A leaf spring 36, having one end 37 secured to the uppermost portion of the slot 35, yieldably urges the latch member 32 toward the laterally outwardly projecting position in which the abutting surface 34 confronts the sleeve 18, but which is retractable by manual pressure against the latch member 32 to allow the latch member to be withdrawn into the confines of the post 31 to allow the post 31 to be withdrawn from the sleeve 18 in order to remove the

toilet seat and cover of the mounting flange 20 of the toilet bowl.

With reference now to FIGS. 5 and 6 of the drawing, a further modified form 40 of the present invention is shown to include a mounting post 41 having a latch member 42 supported within a slot 44 through the free end of the post 41. This latch member 42 is also provided with a detent having an upwardly facing abutment surface 46 which is normally in the laterally outwardly extending position confronting the lowermost end of the sleeve 18, in the manner hereinbefore described. This latch member 42, however, is provided with a laterally extending mounting pin 43 which is slidably received within an angularly inclined pair of slots 45 at the lower end of the mounting post 41, which slots 45 allow the latch member 42 to move inwardly and upwardly with respect to the mounting post 41 under the guiding action of a guide member 49 upon which a lower slide surface 48 of the latch member 42 is slidably supported. Normally, the latch member 42 is urged toward the outwardly extending latch position by gravity, but is retractable to permit withdrawal of the mounting post 41 from the sleeve 18 simply by urging the latch member 42 inwardly and upwardly relative to the mounting post 41 under the control of the guide member 49 and slots 45. In assembling the mounting post 41, downward movement of the mounting post 41 into the sleeve 18 automatically retracts the latch member 42 until such latch member 42 emerges from the lowermost end of the sleeve 18, following which it is urged by gravity toward the outwardly extended position shown, in which it retains the mounting post 41 in assembled relationship with the sleeve 18.

While the abutment surfaces 29 and 34 respectively, of latch members 28 and 32 have been described and shown in FIGS. 1–6 as requiring that arms 28 in the one instance and latch member 32 in the other instance be manually depressed in order to remove the mountings 14 and 31 from their respective sleeves 18 and 19, it will be obvious that if the abutment surfaces are angled obtusely at 29*a* and 34*a*, as shown in FIGS. 7 and 8, respectively, it will not be necessary manually to depress the latch members to remove the mountings from their respective sleeves, but the mounting members 12 can be removed, merely by applying a slight lifting pressure at the back of the seat, the surface 29*a* and 34*a* serving as cams to depress the latch members.

It will now be recognized that in all embodiments of the present invention, the objects of the present invention are accomplished by providing a post member which is releasably locked in secured engagement with the mounting flange of a toilet bowl, but which may be conveniently

released therefrom in a simple and efficient manner. With hinge assemblies made in accordance with the present invention, the removal and replacement of toilet bowl seats and/or covers may be readily accomplished for repair, sanitation, and cleaning purposes.

While this invention has been described with particular reference to the construction shown in the drawing, it is to be understood that such is not to be construed as imparting limitation upon the invention, which is best defined by the claim appended hereto.

What I claim as new and desire to secure by Letters Patent is:

In a toilet bowl having a mounting flange defining at least one aperture, a seat, and a hinge pivotally securing the seat to the bowl, mounting means releasably securing said hinge to the toilet bowl comprising, in combination, a sleeve lining each aperture of said toilet bowl, said hinge including a post slidably received within said sleeve, and latch means acting between said post and said sleeve releasably securing said post in assembled relationship with said toilet bowl, said sleeve extending through said mounting flange and having one terminal portion projecting outwardly beyond one lower surface of said mounting flange, said sleeve having a flange integral with the opposite terminal portion thereof overlying the opposite upper surface of said mounting flange, said latch means being carried by said post for releasable engagement with said one terminal portion of said sleeve, said latch including a detent having an abutting surface movable between an operative position extending laterally outwardly from said post and a retracted position within the confines of said post, said abutting surface in said outwardly extending position confronting said one terminal portion of said sleeve, said detent being yieldingly biased toward said outward extending position, and said post further comprising an enlarged terminal portion at one end overlying said flange of said sleeve, and having a slot extending inwardly from the opposite end of said post, a pin extending transversely across said slot and an inverted U-shaped spring having its bight portion extending around said pin with its arms extending toward said opposite end, a detent on each spring arm defining an abutting surface confronting a portion of said sleeve.

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