ADJUSTABLE SPREAD TOILET SEAT HINGE

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Fig. 1.

Fig. 2.

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It is customary to mount toilet seats and toilet seat covers on toilet bowls by means of hinges which, in the more modern type of construction, are usually secured to the bowl by means of threaded members which pass through vertical apertures in the bowl. The distance apart of these threaded members in the assembled hinge and seat must correspond to the distance apart of the vertical apertures in which they are to be positioned. Oftentimes, as bowls are sometimes built with one spacing between apertures and sometimes with another spacing it has been necessary heretofore either to attach the hinge to the seat on the job in the cheaper types or in the better quality of seats and hinges to have as many different sizes of hinges as there were different spacings likely to be encountered in different bowls. In the latter case if a plumber, in going out to complete such an installation, did not have with him the proper size of hinge, it would be necessary to send for it, which frequently meant sending to the factory. There are many other disadvantages, not necessary to mention in detail, that are associated with this multiplicity in hinge sizes.

One of the objects of the present invention is to produce a toilet seat hinge that can be used with toilet bowls having different spacings between the apertures for the hinge posts.

Another object of the invention is to provide a hinge post and clamping member which are relatively adjustable and which at the same time are retained permanently in their assembled relationship.

A still further object of the invention is to make such a toilet seat hinge by a method that is simple, inexpensive, and that can be carried out in the minimum time.

These and other objects of the invention will readily appear to those skilled in the art to which it pertains by a consideration of the following description of one embodiment thereof taken in connection with the accompanying drawings in which

Fig. 1 is a rear elevation of a toilet seat hinge embodying the invention showing in association therewith, partly broken away, a toilet bowl, seat and cover;

Fig. 2 is a view similar to Fig. 1 showing the hinge posts of Fig. 1 interchangeized in position;

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 1;

Fig. 4 is a bottom plan view of one of the hinge posts showing the securing bolt in section;

Fig. 5 is a greatly enlarged end elevation of the base portion of one of the hinge posts shown in Fig. 3; and

Fig. 6 is a rear view of a hinge post of a modified form.

Referring to the drawings more in detail the reference character 11 indicates a toilet bowl usually made of porcelain and having a rearwardly extending shelf 12 in which there are positioned a pair of vertically disposed apertures 13. A toilet seat 14 and a toilet seat cover 15 are hingedly connected to the bowl by means of hinge structure which will be described somewhat in detail. A suitable hinge leaf 16 is secured to the cover 15, at the left-hand side as seen in Fig. 1, and another hinge leaf 17 is secured to the cover 15 at the right-hand side. Each of these hinge leaves is provided with a bearing aperture 18 through which extends a bearing pintle 19. This pintle is preferably made from cylindrical tubing for reasons of strength and lightness. The seat 14 also has a hinge leaf 20 toward the left and another hinge leaf 21 toward the right. These two hinge leaves, 20 and 21, have bearing sockets 22 therein in which the ends of the bearing pintle 19 are positioned. The distance between the bearing portions of the two leaves for the seat cover is somewhat less than the distance between the bearing portions of the two leaves for the seat so that there is a short space at each end of the pintle 19 between the leaf for the cover and the leaf for the seat. In the left-hand space the upper end of a hinge post 23 is positioned and in the right-hand space there is the upper end of a similar hinge post 24. The upper ends of these hinge posts 23 and 24 are provided with bearing apertures 25 through which the pintle 19 extends.

In hinges of the general type thus far described it has heretofore been the common practice for each of the hinge posts 23 and 24 to have rigidly secured thereto or constructed as an integral part thereof, as by making it as a casting, a downwardly extending threaded cylindrical portion. These threaded portions are positioned in the apertures 13 in the porcelain and are secured therein. The distance between the hinge posts 23 and 24 after they are assembled with the seat and cover determines the distance apart of the apertures 13 with which the hinge can be assembled. For example, if the hinge posts are 5½ inches apart and it is found that the apertures are 7½ inches apart then the seat and hinge
cannot be assembled on the bowl and it is necessary to use a different hinge or at least the hinge leaves must be moved and located at different positions and a different pinte is required.

The brief description of prior practice set forth in the preceding paragraph will render the purpose and advantages of the improved construction now to be described in detail more readily understood. Each of the hinge posts 23 and 24 is provided with a base, 25 and 26 respectively, of elongated form, the longer dimension being parallel to the pinte 19. Extending upwardly from the base 25 of the post 23 is an arm 21 which has therein a hinge bearing 28 in which is supported that portion of the pinte 19 which is between the hinge leaf 16 and the hinge leaf 20. It is to be noted that the arm 27 is not centrally disposed with respect to the base 25, as seen in Fig. 1, but is positioned nearer the right-hand end. The under side of the base 25 is provided with a slot 29 which is disposed longitudinally of the base or in other words so as to be parallel with the pinte 19. This slot preferably extends entirely through the base from one side to the other. It will be seen that the elongation of the base in the same direction as the slot permits the use of a longer slot than would otherwise be the case. The side walls of the slot 23 slope upwardly and outwardly (see Fig. 3) so as to give the slot a V-shaped section. The post 24 has a similar upwardly extending arm 30 with a bearing 28 but in this case the arm is disposed to the left of the center of the base instead of to the right. The base 25 also has a V-slot 28 in the under side thereof.

Bolts 31 are provided for securing the hinge posts to the toilet bowl. These bolts are provided with heads 32 which are constructed in the first place as short cylindrical portions of a length approximately equal to the depth of the slots 29 (see Fig. 1). Opposite sides of the head are then cut at an angle to provide a V-shaped head to fit the slot 29 (see Fig. 3). After one of the bolts 31 has been assembled with its post 23 or 24 having its head inserted in the slot 29, the four corners of the slot are then peened over as shown at 33 in Figs. 4 and 5 so that the bolt and post are thereafter always together although the head of the bolt can be moved along the slot from one end to the other. It is of course possible to complete this operation of assembling the hinge posts and the bolts prior to the assembling of the hinge posts with the pinte and hinge leaves. The final assembling operation is to insert the bolts 31 into the apertures 13 and to clamp them firmly in place by means of nuts 34. Suitable metal washers 38 and gaskets 36 may be employed in the manner shown to distribute the pressure uniformly against the porcelain.

The bolts 31 are shown in full lines in Fig. 1 as being positioned in the apertures 13 and at the extreme inner ends of the slots 28, that is, as close together as possible. In case the porcelain is provided with apertures a greater distance apart the head 32 of the bolt 31 is slid along in the slot 29 in the direction indicated by the arrows A until the spacing between the bolts is the same distance between the apertures. The dotted lines in Fig. 1 indicate such a greater spacing, the bolts being shown at the extreme opposite end of the slot from the full-line position. It has been found quite practicable to make each bolt adjustable a total distance of one inch so that the adjustment of the two bolts taken together provides for a range of aperture spacings in the bowl of the seat and cover at different positions and a different pinte is required.

Fig. 2 indicates how the construction of the hinge posts already described is capable of providing for a still further range in adjustment. It will be noted that the hinge posts 23 and 24 have been interchanged so that the post 23 is now viewed from the left-hand post 24. It is also to be noted that the upwardly extending arm 27 is, in Fig. 1, approximately above the aperture 13 and the bolt 31 is positioned at the end of the slot 29 nearest to the right. In Fig. 2 the arm 35 is approximately above the same aperture 13 but in this case the bolt 31 is positioned at the extreme left-hand end of the slot 29. The relationships respecting the right-hand hinge post are also similarly changed. As a result, with the same hinge as that shown in Fig. 1 there may be used bowls with apertures ranging from the spacing shown in full lines in Fig. 2 of the spacing shown in dotted lines or approximately two inches less by merely sliding the bolts in the slots in the direction of the arrows B. It is to be understood that the use of specific figures is illustrative only and not by way of limitation.

In Fig. 6 there is shown a modified form of hinge post 41 which is provided with a bearing socket 42 which unlike the bearings in the hinge posts 23 and 24 does not extend all the way through. With such a pair of hinge posts the hinge leaves of both the seat and the cover have bearing apertures extending clear through and they are both mounted on the pinte 19 inside of the hinge posts 41 which are positioned at the end of the pinte.

The type of construction which has been described as embodying the invention has certain advantages to which attention should be specifically directed. The V-shaped slot, as distinguished from a T-slot for example, is shallow and does not require the base 25 (or 26) to be as thick as would be required by a T-slot. The V-slot also permits a closure thereof as indicated at 33 much more readily than would a T-slot and perhaps more readily than any other form of slot whatever could be chosen. This type of closure for the slot, a peening over of the corners, also permits the bolt itself a maximum range of adjustment as contrasted with any form of slot whatever which is completely closed at the end, as by not being milled clear through. A slot cut in the drawings is also readily formed on a milling machine. The standard practice in forming a T-slot on a milling machine, for example, would require 4 distinct operations of a milling cutter as against one operation for the V-slot.

The offset feature of the hinge arm with respect to the base of the hinge post is again mentioned because the same size of the base or rather the same dimension in the elongated direction permits twice the possible range of variation in the aperture spacings, or stated conversely, for the same range in adjustment a base need be made only a little more than twice as large as would be required if the hinge arm were positioned centrally with respect to the hinge post.

It is to be understood that the above description of specific details is for purposes of illustration only and various changes may be made therein without departing from the spirit and scope of the invention as defined in the subjoined claims.

I claim:

1. In an adjustable spread toilet seat hinge, a 75
hinge post having a base adapted to rest on a toilet bowl, means positioned on the upper portion of said base for hingedly connecting it with a toilet seat, said base having a V-slot in the under side thereof, and a clamping member having a V-shaped portion adjustably positioned in said slot, the four corners of said V-slot being bent inwardly to retain the clamping member permanently within said slot.

2. An adjustable spread toilet seat hinge for interchangeable mounting on different toilet bowls each having a pair of vertically disposed apertures spaced a different distance apart comprising a pair of hinge posts, each post having a base and an upper portion, said upper portion having means for pivotally supporting a toilet seat for movement around an axis extending from one post to the other, hinge means carried by the toilet seat and pivotally supported by said upper portions, the under side of each base being provided with a V-shaped slot extending parallel to the axis of the pivotal movement, a pair of threaded members having V-shaped heads for engagement with said respective slots for securing said hinge posts by means of said apertures to a toilet bowl in any adjusted position throughout the length of said slots to provide an adjustment of the spacing between said members, each of said upper portions being offset with respect to its respective base in a direction parallel to the axis of pivotal movement, the direction of said offset being in opposite directions in the two posts of said pair whereby the interchanging of said posts provides another adjustment of the spacing of said threaded members supplementary to and in addition to said first-named adjustment.

3. An adjustable spread toilet seat hinge for interchangeable mounting on different toilet bowls each having a pair of vertically disposed apertures spaced a different distance apart comprising a pair of hinge posts, each post having a base and an upper portion, said upper portion having means for pivotally supporting a toilet seat for movement around an axis extending from one post to the other, hinge means carried by the toilet seat and pivotally supported by said upper portions, the under side of each base being provided with a V-shaped slot extending parallel to the axis of the pivotal movement, a pair of threaded members having V-shaped heads for engagement with said respective slots for securing said hinge posts by means of said apertures to a toilet bowl in any adjusted position throughout the length of said slots to provide an adjustment of the spacing between said members, each of said upper portions being offset with respect to its respective base in a direction parallel to the axis of pivotal movement, the direction of said offset being in opposite directions in the two posts of said pair whereby the interchanging of said posts provides another adjustment of the spacing of said threaded members supplementary to and in addition to said first-named adjustment, the four corners of each of said V-shaped slots being peened over to provide stops at each end of the slots.

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