June 20, 1944. P. J. SPERZEL ET AL 2,352,133

TOILET SEAT

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Fig. 1.

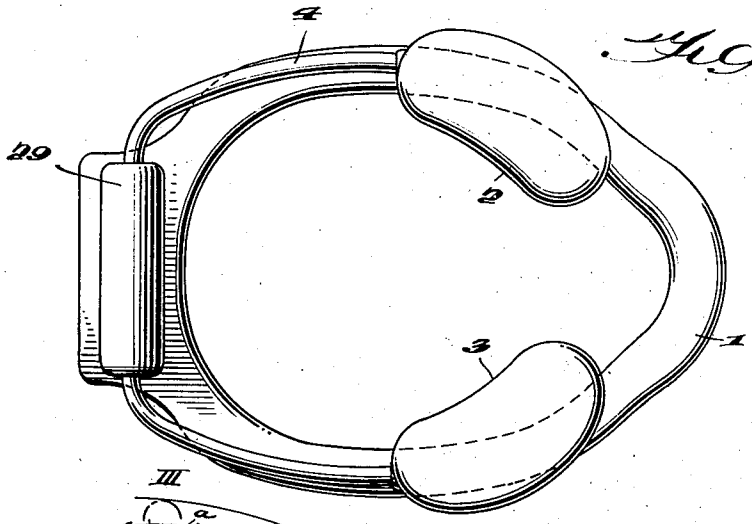


Fig. 2.

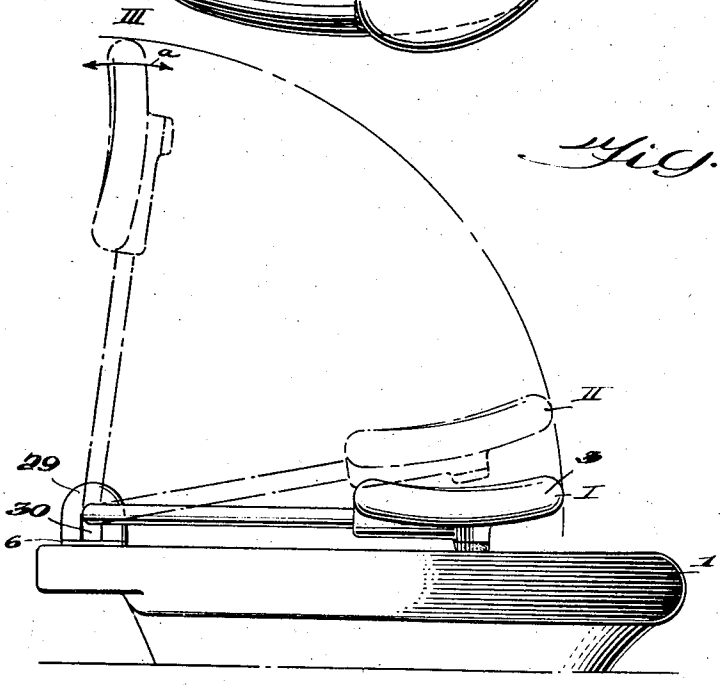
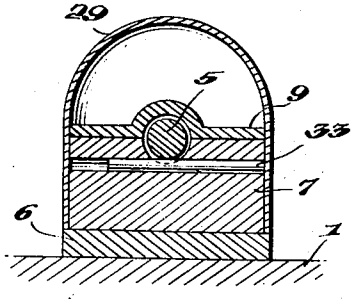


Fig. 6.



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Fig. 3.

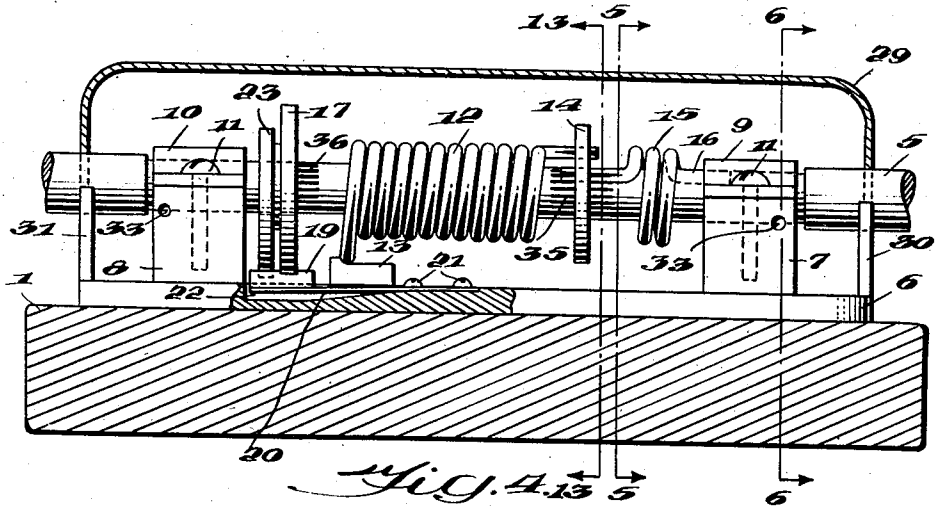


Fig. 4.

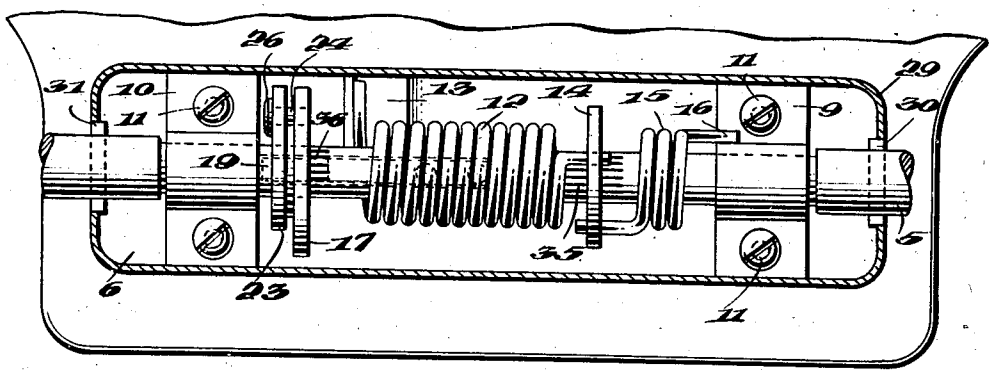


Fig. 5.

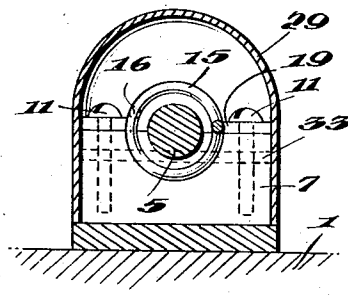
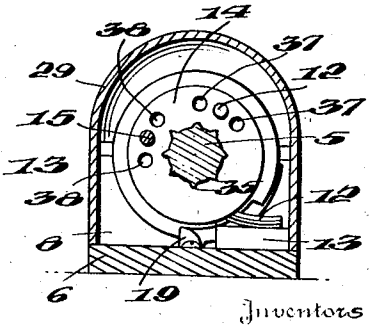


Fig. 13



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Fig. 7.

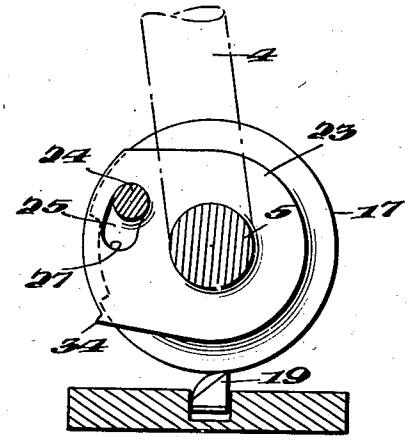


Fig. 8.

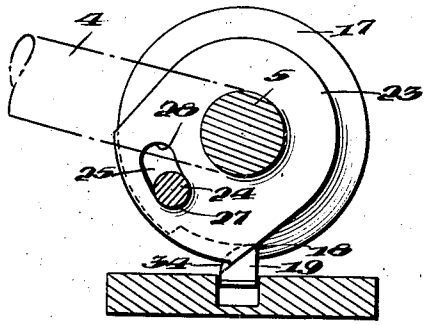


Fig. 9.

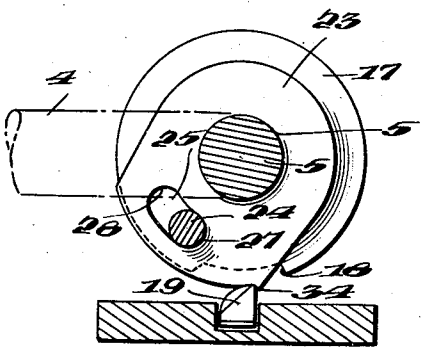


Fig. 10.

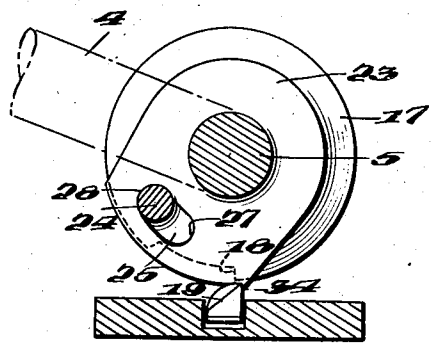


Fig. 11.

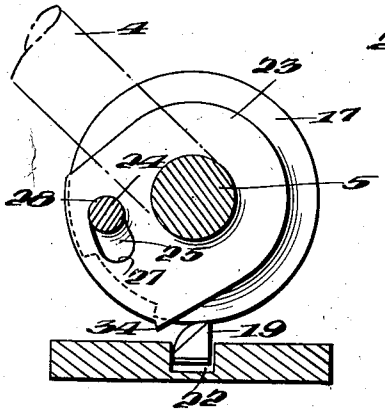
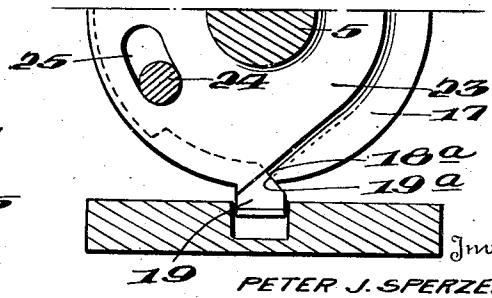


Fig. 12.



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UNITED STATES PATENT OFFICE

2,352,133

TOILET SEAT

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Application September 24, 1941, Serial No. 412,180

7 Claims. (Cl. 4—241)

Our invention relates to toilet seats and is more particularly directed to toilet seats associated with means for raising the same from the toilet bowl.

It has long been known to provide means for raising a toilet seat from the bowl for sanitary purposes, and to accomplish this it is usual to provide biasing means such as a weight or a spring to exert an upward force of the seat. Whereas this construction is desirable for maintaining sanitary conditions, at the same time it results in serious inconvenience to the user which has prevented its wide employment. In particular, the constant tendency of the biased seat to move upwardly demands that the seat be held in the lowered position until the user is seated thereon.

It is obviously possible to use a simple latch for holding the biased seat down to avoid these difficulties, but as a practical matter such a construction would be no more sanitary than the ordinary unbiased seat, because the users, particularly in public facilities, would not release the latch and the seat would not be raised.

The chief object of the invention, therefore, is to provide a toilet seat construction in which the seat, upon being lowered, will remain in a lowered position for sitting, and will automatically move to a raised position after the termination of occupancy.

A further object of the invention is to provide a biased toilet seat with a unified hinge construction for holding the seat in a lowered position and for automatically releasing the seat after occupancy.

Another object of the invention is to provide a hinge device for use with a biased toilet seat which will hold the seat in a lowered position and which will release the seat automatically after occupancy.

A further object of the invention is to provide a hinge device for a toilet seat which, while biasing the seat to raised position, will hold the seat in a lowered position and automatically release the seat after occupancy.

A still further object of the invention is to provide a hinge construction for these purposes in which the complete mechanism is entirely enclosed so that the same may be easily maintained in a sterile and sanitary condition.

Another object of the invention is to provide means for holding the seat in a lowered position which yields on direct application of force to the seat so that the same may rise without injuring the holding means.

In carrying out the objects of the invention we provide an upwardly biased toilet seat construction with means for holding the seat in a lowered position, and means responsive to the application of weight on the lowered seat to release the holding means and to permit the seat to move to a raised position after occupancy.

The invention is particularly applicable to the type of toilet seat construction described in Sperzel Reissue Patent No. 20,696 wherein seat pads of relatively small area are provided at either side of the bowl generally forward of the center line thereof, and the seat pads are connected by a yoke journaled in hinge brackets at the rear of the bowl. Manifestly, however, the invention may be employed with other types of seat constructions.

The invention will be further understood with reference to the drawings in which:

Fig. 1 is a top view of the toilet seat construction attached to a toilet bowl;

Fig. 2 is a side view of the toilet seat construction attached to a toilet bowl, showing in dotted line the operating positions of the toilet seat;

Fig. 3 is a rear view of the hinge construction, partially in section;

Fig. 4 is a top view of the hinge construction with the cover broken away;

Fig. 5 is a sectional view of the hinge construction taken on the line 5—5 of Figure 3;

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 3;

Figs. 7 through 11 are detailed views partly in section of the locking mechanism of the invention in successive operating positions;

Fig. 12 is a sectional view of a slightly different embodiment of my invention in an operating position corresponding to that of the main embodiment as shown in Fig. 8; and,

Fig. 13 is a sectional view of the hinge construction taken on the line 13—13 of Fig. 3.

As shown in Fig. 1, the toilet seat may be mounted on a conventional toilet bowl 1. As mentioned above, the toilet seat includes seat pads 2 and 3 mounted on a U-shaped yoke 4 which is formed with a pair of spaced arms and an intermediate straight section 5 (see Fig. 4) at the rear which constitutes the hinge rod.

The hinge rod 5 is attached to the toilet bowl by bracket 6 which includes the upstanding journal members 7 and 8 (see Figs. 3 and 4). The hinge rod 5 is received in bearings in the journal members 7 and 8 which are provided with bear-

ing caps 9 and 10 attached to the journal members by suitable screws 11.

As illustrated in Fig. 6 hinge rod 5 is provided with grooves 32 which coact with pins 33 inserted in the journal members to provide a ridge in the lower portion of each bearing. This construction is utilized to prevent endwise movement of hinge rod 5.

The toilet seat is biased to raised position, and for this purpose we provide a spring. In the embodiment shown we employ a helical torsion spring 12 which surrounds, and is supported by, the hinge rod 5. One end of the biasing spring engages the hinge bracket 6 through fixed block 13 carried thereby. The other end of the biasing spring 12 is connected to hinge rod 5 by insertion through an aperture in member 14 attached thereto.

In order to provide means for adjusting the tension of spring 12 a series of apertures 37 are formed in member 14. The tension on spring 12 will depend upon which aperture the end of the spring is inserted in, and thereby the desired biasing force exerted by the spring can be obtained when the hinge construction is assembled.

As shown in Fig. 13 member 14 may preferably be splined onto the hinge rod through splines 35 engaging corresponding grooves in member 14.

In order to limit the upward movement of the seat and to absorb the shock of its momentum received during movement by biasing spring 12, shock absorbing stop spring 15 is employed. This spring surrounds hinge rod 5 and one end thereof is connected thereto through member 14. For this purpose member 14 is provided with another series of apertures 38 into any one of which the end of spring 15 may be inserted. In this way the operation of the stop spring may be adjusted as desired. The free end 16 of spring 15 overlies bearing cap 9 of journal member 7, as shown in Fig. 5. As the seat approaches its raised position end 16 of spring 15 engages the bearing cap and increasingly retards the movement of the seat, spring 15 being deformed, and bringing the seat to a cushioned stop. In case the seat overshoots its final position, it is returned thereto by action of stop spring 15.

For the purpose of locking the toilet seat in a lowered position so that the same may be conveniently occupied by a user we provide a detent which is movable with the seat and which coacts with a latch having a fixed mounting. As shown in Figs. 3 and 4, and Figs. 7 through 11, member 17 fixed to hinge rod 5 is provided with face 18 which constitutes the detent movable with the seat. Latch 19 is carried by fixed hinge bracket 6, being connected thereto through a resilient leaf spring 20. Leaf spring 20 is secured to the hinge bracket 6 by screws 21, and permits latch 19 to operate in recess 22 of the hinge bracket.

Latch 19 extends beyond member 17 so that it may be retracted from engagement with detent 18 by operation of cam member 23. This cam member is loosely journaled on hinge rod 5 adjacent member 17 affixed thereto. Cam member 23 constitutes means for rendering latch member 19 inoperative, and for this purpose it is operatively connected to hinge rod 5 through a lost motion connection. The latter is formed by pin 24 which is carried in a fixed position on hinge rod 5 by member 17. Pin 24 passes through an arcuate aperture 25 in cam member 23, and is provided with a head 26 for retaining the cam member 23 in its proper position. Cam member 23 therefore may be driven in either direction by engagement of pin 24 with either of the end faces 27 or 28 of aperture 25. This detail of the construction is best shown in Figs. 7 through 11, in connection with which the operation of the invention will be described.

It will be noted that the construction described constitutes a compact unified hinge device which may be conveniently enclosed by a cover presenting a smooth exterior surface free of crevices so that the same is easily maintained in a sanitary condition. For this purpose a cover 29 is provided which in conjunction with end pieces 30 and 31 carried by the hinge bracket 6 and underlying the hinge rod 5 completely encloses the hinge construction.

The operating positions of the toilet seat are shown in Fig. 2. The toilet seat is shown in horizontal position in engagement with the toilet seat in full line position at I. In broken line at position II the seat is shown held in a lowered position through coaction of detent 18 and latch 19. In broken line at position III the seat is shown raised under operation of biasing spring 12. The arc a indicates the range of cushioning stop action exerted by stop spring 15.

In Fig. 7 are shown the positions taken by detent 18 and latch 19 when the toilet seat is raised as shown in position III of Fig. 2. When the user depresses the seat preparatory for occupancy, as the seat approaches position II latch 19 riding against the periphery of member 17 engages extension 34 of cam member 23. As cam member 23 is freely journaled on hinge rod 5 it lies against latch 19, and pin 24 merely takes up the lost motion in arcuate opening 25. When the seat reaches position II latch 19 under the action of spring 20 snaps into engagement with detent face 18. In this position the lost motion provided by the arcuate opening 25 has been substantially taken up and the parts are in the position shown in Fig. 8.

As the user sits on the seat the weight depresses the same, and it comes into engagement with the toilet bowl as shown at positions III. The corresponding positions of the latch mechanism are shown in Fig. 9.

Rotation of member 17 carries the detent 18 beyond its point of engagement with latch 19, and engagement of pin 24 with end face 27 of aperture 25 has depressed latch 19 by forcing cam member 23 over the inclined face of latch 19. The upward pressure of spring 20 on latch 19 forces the latter upwardly into engagement with the outer face of cam member 23 after extension 34 rides past latch 19.

When the seat is released after occupancy, biasing spring 12 rotates hinge rod 5. As shown in Fig. 10 this returns detent 18 of member 17 toward latch 19. Due, however, to the lost motion between pin 24 and end face 28 of arcuate opening 25 of cam member 23, the latter remains in engagement with latch 19 and holds the same in a depressed position in which it is cleared by detent 18. Any tendency of hinge rod 5 to move cam member 23 by friction is overcome by the engagement of latch 19 with extension 34 on the cam. As the seat rises by rotation of hinge rod 5 pin 24 comes into positive contact with end face 28 of arcuate opening 25 after detent 18 passes latch 19. This is shown in Fig. 10. As the seat continues to rise cam member 23 receives positive actuation and extension 34 is drawn off latch 19 as is shown in Fig. 11. Latch 19 is thereby reconditioned for further

holding operation incident to subsequent usage of the seat. From the position shown in Fig. 11 the seat is returned by biasing spring 12 toward raised position III of Fig. 2.

By the shock absorber action of stop spring 15 the seat is retarded at first gradually, then with increasing force, within the range of arc *a*. Where its momentum is sufficient to carry it past position III, stop spring 15 returns it thereto. By this procedure, quiet operation is assured and shock to the operating mechanism is avoided.

It will therefore be seen that the upwardly biased seat may be moved from the raised position III to a lowered or holding position II, for convenience of the user, and that automatically after the termination of occupancy the seat is returned to the raised position so that the same will be maintained in a sanitary condition.

It will be understood that in cases where the invention is installed in public conveniences it may be subject to misuse. Thus, when the seat is in the lowered or holding position an attempt may be made to raise the same through direct application of force. This may occur through ignorance of the user or even by wilful destructiveness. Under certain circumstances, therefore, it may be desirable to provide yielding holding means for latching the seat in the lowered position. For this purpose the holding means may be constructed as shown in Fig. 12 wherein the parts are in an operating position corresponding to Fig. 8 of the main embodiment.

In this embodiment the coacting surfaces of latch 19 and member 17, 19*a* and 18*a* respectively, are slanted so that positive locking does not occur as in the main embodiment. The upward pressure on latch 19 exerted by spring 20 is selected so that the engagement of surface 19*a* with surface 18*a* prevents upward movement of the hinge rod by biasing spring 12; but on the application of additional force surface 18*a* cams latch 19 downwardly and permits the seat to rise without in anyway damaging the operating parts of the hinge construction. It will be understood that the operation of the construction shown in Fig. 12 is otherwise similar in all respects to that of the main embodiment as shown in and described in connection with Figs. 7 through 11. It is also manifest that the provision of a yielding holding means for maintaining the toilet seat in a lowered position constitutes in itself an improvement over prior known devices aside from the other operating features of the invention.

It will be understood that the form of the invention herein shown and described is merely illustrative. The scope of the invention is to be determined by the appended claims.

We claim:

1. In a hinged toilet seat biased to swing upwardly away from its position of use, a hinged mounting for the seat having a fixed support, releasable holding means for holding the seat in a lowered position preparatory for use including coacting means on the hinged mounting and support operated by movement of the seat into said last-named position, and said holding means further including relatively movable releasing means on the hinged mounting operative in response to further lowering movement of the seat from said last named position to release said coacting means for upward swinging movement of the seat by the biasing means.

2. In a toilet seat having a hinge device for mounting the seat over a toilet bowl and biased to swing upwardly away from its position of use over the bowl, bracket means pivotally supporting said hinge device and having means for attachment to the bowl, locking means carried by and movable with the hinge device and having means coacting with the bracket means to hold the hinge device against pivotal movement in one direction on the bracket means, and releasing means also carried by and movable with the hinge device and having means responsive to movement of the hinge device in another direction from its held position to render the locking means inoperative to hold the hinge device against movement.

3. In a toilet seat having a hinge device for mounting the seat over a toilet bowl and biased to swing upwardly away from its position of use over the bowl, bracket means pivotally supporting said hinge device and having means for attachment to the bowl, a spring biased latch carried by the bracket means, locking means carried by and movable with the hinge device and having means coacting with the latch to hold the hinge device against pivotal movement in one direction on the bracket means, and releasing means also carried by and movable with the hinge device and having means responsive to movement of the hinge device in another direction from its held position to release the latch from said locking means.

4. A hinge device for mounting a toilet seat on a toilet bowl including bracket means attachable to the bowl, hinge means for supporting the toilet seat pivotally carried by the bracket means, an apertured member disposed between said bracket means and secured to said hinge means, biasing means including two springs working against each other with their adjacent ends locked in said apertured member for moving the same in one direction for raising the toilet seat and yieldably holding the same in substantially vertical position, and weight responsive holding means carried by the hinge means and coacting with the bracket means in one position of movement of the hinge means to hold the hinge means against movement in one direction, said holding means including a relatively movable part becoming operative on further application of weight on the seat when the hinge means is held by said holding means to permit movement of the hinge means thereafter by the biasing means.

5. A hinge device for mounting a toilet seat on a toilet bowl including bracket means attachable to the bowl, hinge means for supporting the toilet seat pivotally carried by the bracket means, biasing means including a pair of oppositely acting springs having their adjacent ends operatively connected to the hinge means intermediate the supporting bracket means for moving the same in one direction to raise the toilet seat and for yieldably retaining the same in raised position, locking means carried by the hinge means and coacting with the bracket means in one position of movement of the hinge means to hold the hinge means against movement in one direction by the biasing means, and releasing means also carried by the hinge means and movable therewith in one direction relative to the locking means and becoming operative in response to movement of the hinge means from held position to release the locking means and permit movement of the hinge means thereafter by the biasing means.

6. In a hinged toilet seat having a transverse hinge rod adjacent its rear portion and supporting means rotatably mounting the rod with respect to an underlying toilet bowl, a radially projecting flange-like member rigidly mounted on an intermediate portion of said transversely extending hinge rod for rotation therewith, a coiled seat-lifting spring surrounding one end portion of the hinge rod with one end of the spring reacting against said flange-like member and the other end thereof reacting against said supporting means as a fixed base of reaction, and a coiled shock absorbing spring surrounding the opposite end portion of the hinge rod, said shock absorbing spring having one end reacting against said flange-like member and its other end reacting against said supporting means as a fixed base of reaction, said seat-lifting spring being biased to lift the seat carried by the hinge rod to a predetermined vertical position, and said shock-absorbing spring biasing in the opposite direction through the medium of said radially projecting flange-like member to resist movement of the seat beyond said predetermined vertical position.

7. In the structure defined in claim 6 wherein the radially projecting flange-like member is provided with a series of circumferentially spaced apertures in which the adjacent ends of the seat-lifting and shock absorbing springs are selectively engaged.

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