

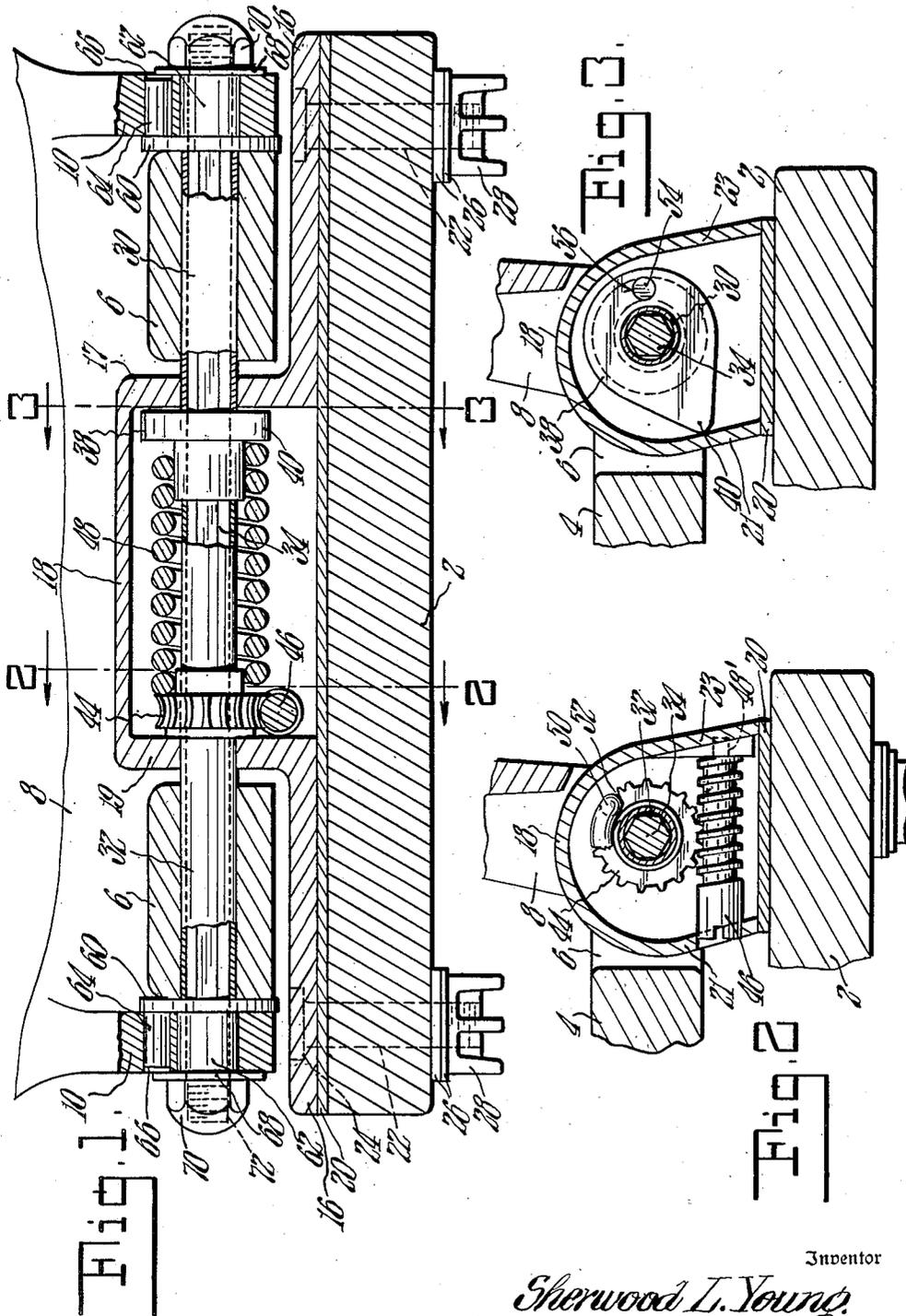
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HINGE CONSTRUCTION

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HINGE CONSTRUCTION

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This invention relates to hinge construction.

The principal objects of the invention are directed to the provision of a hinge construction which is constructed and arranged in a novel manner so as to facilitate ready and easy assembling of the components while at the same time it is efficient in operation.

The hinge construction of the invention is adapted for many and various uses and while particularly adapted for hingedly connecting a seat and cover to a toilet bowl it is not limited to that use.

According to novel features of the invention, a toilet seat and cover may be hingedly connected to a toilet bowl for independent relative swinging movements thereof relative to the bowl and means is provided whereby movement of the cover from substantial vertical open to closed position is resisted by means to obviate the slamming of the cover on the seat.

According to special features of the invention, the resisting means is adjustable whereby it is possible to offer more or less resistance to closing movement of the cover and is desirable inasmuch as covers of different weights and/or dimensions require different degrees of resistance in order to overcome slamming.

With the foregoing and various other novel features and advantages and other objects of my invention as will become more apparent as the description proceeds, the invention consists in certain novel features of construction and in the combination and arrangement of parts as will be hereinafter more particularly pointed out in the claims hereunto annexed and more fully described and referred to in connection with the accompanying drawings wherein:

Fig. 1 is a longitudinal vertical sectional view through a hinge construction embodying the novel features of the invention and having the hinged together parts of a toilet-bowl, seat and cover associated therewith;

Fig. 2 is a transverse sectional elevational view on the line 2—2 of Fig. 1; and

Fig. 3 is a similar view on the line 3—3 of Fig. 1. Referring now to the drawings more in detail, the invention will be fully described.

A rear upper portion of a toilet bowl to which a seat and cover are hingedly connected is represented by 2. A seat is represented by 4 which has spaced hinge ears 6 and a cover represented by 8 has spaced hinge ears 10.

The toilet bowl, seat and cover form no part of the present invention and may take many and various forms. So much thereof is shown for purposes of describing the invention and it will

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be assumed that the seat is in horizontal position on the toilet bowl and that the cover is in substantially vertical open position.

A support is provided which is formed to have opposite end flanges 16 and a central housing 18 which is open at the lower side thereof.

A gasket 20 underlies the housing and is disposed on the toilet bowl. This gasket will preferably be formed from some more or less yieldable material. Bolts 22 have heads 24 countersunk in the flanges 16 and extend downwardly through the gasket 20 and toilet bowl 2. Washers 26 and nuts 28 on the lower ends of the bolts 22 facilitate securing the support to the toilet bowl.

A tube 30 extends through a right hand end wall 17 of the housing 18 and a tube 32 extends through an opposite end wall 19 of said housing.

A main shaft 34 extends through and is rotatable in said tubes 30 and 32 and said shaft is preferably non-round. Said shaft may have any non-round cross sectional shape but for illustrative purposes is hexagonal.

A stop member 38 adjacent the end wall 17 and within the housing is provided with an outer end 40, as shown in Fig. 3. This member 38 has an axial hexagonal hole receiving the shaft 34 so as to be non-rotatable relative thereto.

Adjacent inner ends of the tubes 30 and 32 abut opposite sides of the member 38, as shown in Fig. 1.

A gear 44 within the housing and adjacent end wall 19 thereof may be rotatable on tube 32. A worm 46 is rotatable in a forward wall 21 of the housing and has a pilot 48 rotatable in a rear wall 23 of said housing, see Fig. 2. Said worm 46 is in mesh with the gear 44 and as it is rotated in one direction or the other the gear is rotated thereby.

A coil spring 48 surrounds the inner end of the tube 32 and one end 50 thereof is disposed in a seat 52 of the gear 44, see Fig. 2. The opposite end 54 of said spring is engaged in a hole 56 provided in stop 38, see Fig. 3.

The ears 6 of the seat are mounted on the tubes 30 and 32 so that said seat may swing without imparting rotation to the central shaft 34.

If desired, the tubes 30 and 32 may rotate in the end walls of the housing and the ears 6 may be fixed thereto. In any event, the arrangement will be such that the tubes and thereby the seat will be swingable independently of the shaft 34.

Washers 60 at outer ends of tubes 30 and 32 have hubs 62 which are provided with hexagonal holes receiving the shaft 34 whereby they are non-rotatable relative thereto.

The ears 10 of the cover are mounted on the

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hubs 62 and dowels 64 extend from the washers 60 into sockets 66 of the said ears, see Fig. 1. Thus the central shaft 34 and washers 60 are relatively non-rotatable and any swinging movement of the cover brings about oscillation of the said shaft 34 according to the direction of movement of said cover.

Washers 68 are disposed on opposite ends of the central shaft and nuts 70 are in engagement with threaded extremities of said shaft.

With the parts assembled as shown and described, the cover is held against swinging rearwardly from its substantially vertical open position by the point 40 of stop 38 which engages the inner side of housing wall 21 as in Fig. 3.

The cover 8 may be swung counterclockwise for closing from its substantially vertical open position shown in Fig. 3.

The stop 38 is non-rotatable relative to shaft 34 and as the cover is swung to closed position, the shaft and thereby the stop 38 are rotated so that spring 48, the ends of which are connected to the gear and stop 38, is wound up to some extent and offers resistance to the swinging downwardly of the cover. That is, the swinging of the cover downwardly is resisted by the action of the spring 48 to prevent slamming of the cover on the seat 4.

The spring action may be varied by rotating the gear 44 by means of the worm 46 in one direction or the other. That is, more or less spring tension and resulting resistance may be obtained by winding up or unwinding the spring the ends of which are engaged by the normally stationary gear and stop, all to the end that the closing of covers of different weights or dimensions may be cushioned and prevented from slamming on the seat.

The invention may be embodied in other specific forms without departing from the essential characteristics thereof. Hence, the present embodiments are therefore to be considered in all respects merely as being illustrative and not as being restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all modifications and variations as fall within the meaning and purview and range of equivalency of the appended claims are therefore intended to be embraced therein.

What it is desired to claim and secure by Letters Patent of the United States is:

1. Hinge construction for independently and swingably mounting to a toilet bowl a seat provided with spaced ears having aligned openings and a cover provided with ears outside the ears of the seat and having openings in alignment with those of the ears of the seat comprising, an elongated support for securement to a toilet bowl and having a hollow housing intermediate opposite ends thereof for disposition between the ears of a seat and having opposite end walls provided with aligned openings, a non-round shaft extending through said housing and the openings in the end walls thereof having opposite end portions each adapted to extend through the openings of adjacent ears of the cover and seat, elongated end tubes rotatable on said shaft having inner adjacent ends in spaced relation in said housing and outer end portions extending in opposite directions through and rotatable in the openings in the end walls of the housing and adapted to extend through the openings of the ears of said seat for rotation thereof, means for non-rotatably connecting outer ends of said shaft

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to said ears of the cover, a stop member non-rotatable on said shaft in said housing between adjacent inner ends of the end tubes, a worm gear adjustably rotatable in said housing on one of said end tubes, a worm rotatable in said housing and in engagement with said worm gear for holding said worm in adjusted positions, and a coil spring around said one end tube having opposite ends disposed in recesses provided in said stop member and in said worm gear, said stop provided with a portion for engaging said housing to limit swinging of a cover in one direction and said spring adapted to yieldingly resist swinging of said cover in an opposite direction as said cover acts on said spring through said shaft and stop member.

2. Hinge construction for independently and swingably mounting to a toilet bowl a seat provided with spaced ears having aligned openings and a cover provided with ears outside the ears of the seat and having openings in alignment with those of the ears of the seat comprising, an elongated support for securement to a toilet bowl and having a hollow housing intermediate opposite ends thereof for disposition between the ears of said seat and having opposite end walls provided with aligned openings, a non-round shaft extending through said housing and the openings in the end walls thereof having opposite end portions each adapted to extend through the openings of adjacent ears of the cover and seat, elongated end tubes rotatable on said shaft having inner adjacent ends in spaced relation in said housing and outer end portions extending in opposite directions through and rotatable in the openings in the end walls of the housing and adapted to extend through the openings of the ears of said seat for rotation thereof, means for non-rotatably connecting outer ends of said shaft to said ears of the cover, a stop member non-rotatable on said shaft in said housing between adjacent inner ends of the end tubes, a worm gear adjustably rotatable in said housing on one of said end tubes, a worm rotatable in said housing and in engagement with said worm gear for holding said worm in adjusted positions, and a coil spring around said one end tube having opposite ends disposed in recesses provided in said stop member and in said worm gear, said stop provided with a portion for engaging said housing to limit swinging of a cover in one direction and said spring adapted to yieldingly resist swinging of said cover in an opposite direction as said cover acts on said spring through said shaft and stop member, said means for connecting the outer ends of said shaft and ears of the cover including hubs non-rotatable on said shaft in the openings of said ears and having dowels for engaging said ears.

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