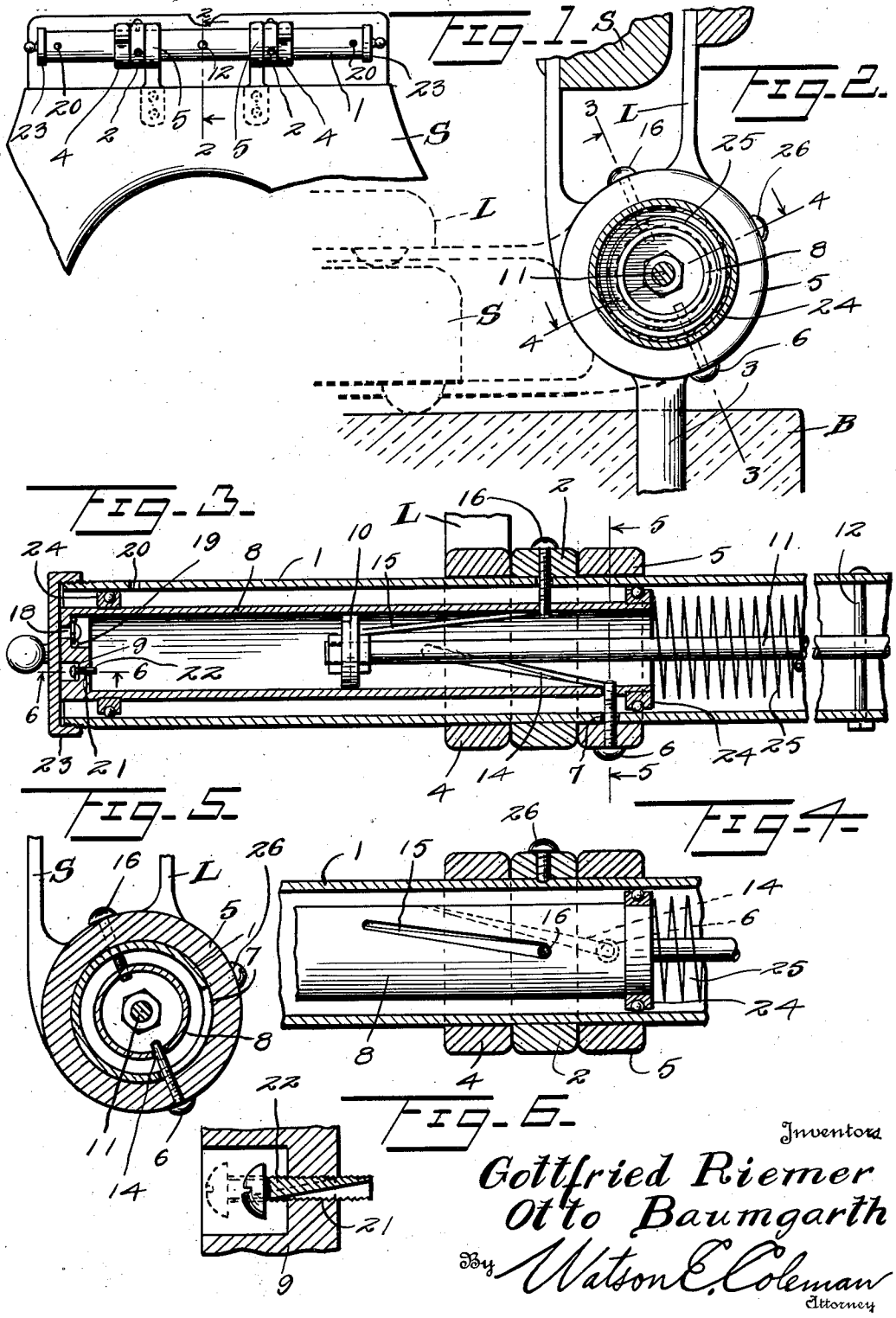
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COMBINED HINGE AND CHECK

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COMBINED HINGE AND CHECK

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This invention relates to a combined hinge and check, and it is primarily an object of the invention to provide a device of this kind wherein means are provided for checking or controlling the movement in one direction of one of the members with which the hinge is employed and wherein the checking mechanism is concealed and thus not interfering with the esthetic value of the hinge.

Another object of the invention is to provide a device of this kind wherein the checking means is substantially confined within the pintle of the hinge so that such mechanism is effectually concealed.

A still further object of the invention is to provide a device of this kind wherein the checking means is of pneumatic character and comprises a relatively movable piston and cylinder, such relative movement being in a direction substantially at right angles to the direction of relative movement of the parts connected by the hinge.

A more specific object of the invention is to provide a device of this kind adapted for use in connection with a toilet and to provide means whereby is prevented the slamming of a seat or lid.

The invention consists in the details of construction and in the combination and arrangement of the several parts of our improved combinded hinge and check whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of our invention will hereinafter be definitely claimed.

In order that our invention may be the better understood, we will now proceed to describe the same with reference to the accompanying drawing, wherein:—

Figure 1 is a view in top plan of a combined hinge and check constructed in accordance with an embodiment of our invention and shown applied to a toilet;

Figure 2 is an enlarged fragmentary sectional view taken substantially on the line 2—2 of Figure 1, the seat with which the hinge is connected being shown by full lines in raised position and by broken lines in a lowered position;

Figure 3 is a fragmentary longitudinal sectional view taken substantially on the line 3—3 of Figure 2;

Figure 4 is a fragmentary view partly in section and partly in elevation, the section being substantially on the line 4—4 of Figure 2;

Figure 5 is a detailed sectional view taken substantially on the line 5—5 of Figure 3; and

Figure 6 is an enlarged fragmentary sectional view taken substantially on the line 6—6 of Figure 3.

In the accompanying drawing we illustrate our combined hinge and check as used in connection with a toilet bowl B and a seat S. This, however, is only for the purposes of illustration and it is to be understood that the hinge and check could be employed with equal facility in connection with the lid or cover L or such a hinge could be used with both the seat S and cover or lid L.

Our improved hinge and check as herein disclosed comprises an elongated tubular pintle 1 of desired length. This pintle 1 is disposed in a well known way through the rings 2 each having a post 3 whereby the same may be effectively anchored to a closet bowl or other desired support.

Snugly but freely surrounding the pintle 1 to one side of the ring 2 is the ring 4 comprised in the hinge section which connects with the lid or cover L, and snugly surrounding the pintle 1 at the opposite side of the ring 2 is a second ring 5 comprised in the hinge section connecting to the seat S. In the present embodiment of our invention each of the rings 5 has associated therewith a check means but as this means is the same in connection with each one it is only believed necessary that a detailed illustration be made with respect to one ring 5.

The ring 5 carries an inwardly directed finger 6 of desired length herein disclosed as a screw member threaded through the ring 5. This finger or member 6 is also freely directed through a circumferentially disposed slot 7 suitably positioned in the wall of the pintle 1 and of a length to allow the desired swinging action of the seat S into either fully open or fully closed position.

The length of this slot 7 will depend mainly upon the extent of swinging movement of the seat S.

Positioned within the adjacent end portion of the tubular pintle 1 is a cylinder 8 having its outer end closed by the head 9 and snugly engaged within this cylinder 8 is a piston 10. The piston 10 in the present embodiment of our invention is mounted upon an end portion of a rod 11 which is held against movement in any desired manner but is herein disclosed as through the medium of a pin 12 disposed radially through the pintle 1 and the rod 11. It is, therefore, to be understood

that the cylinder 8 has endwise movement with respect to the piston 10 and for this purpose the periphery of the cylinder 8 is provided therealong with a spiral groove or channel 14 into which is received the inner free end portion of the finger 6. The groove or channel 14 is disposed on any preferred degree of pitch but preferably at approximately ninety degrees although we do not wish to be understood as limiting ourselves in this respect.

The periphery of the cylinder 8 is also provided with a second spiral groove or channel 15 disposed on any preferred degree of pitch but less than the degree of the groove or channel 14, and it is to be further noted that the grooves or channels 14 and 15 are reversely disposed. The groove 15 receives the inner end portion of an inwardly directed finger 16 carried by the ring 2, said finger being also herein disclosed as a screw member threaded through said ring 2.

In view of this particular assembly it is believed to be obvious that as the seat S is raised the action of the finger 6 within the groove 14 will cause the cylinder 8 to move outwardly with respect to the piston 10 and which movement is facilitated by the fact that undue rotation of the cylinder 8 is prevented by the finger 16 which is received within the groove or channel 15. As the cylinder 8 moves outwardly air will enter therein through the port 18 disposed through the head 9, retrograde flow through such port 18 being prevented by the check valve 19. The tubular pintle 1 is provided with a suitable opening 20 to assure the requisite air supply. If preferred more than one of such openings 20 may be provided.

When the seat S is moved to return to mounted position upon the bowl B and after it passes the vertical, said seat S will continue its downward movement by gravity but such movement will be checked or retarded by the compressing of the air within the cylinder 8 in advance of the piston 10. This air, however, escapes through a vent opening 21 provided in the head 9 of the cylinder 8. The flow through said vent opening is regulated or controlled by the valve screw 22 of a conventional type. As is believed to be clearly apparent the greater the open area of the vent 21 the quicker the seat S will drop and vice versa.

Each end of the tubular pintle 1 is preferably closed by a cap 23 threaded or otherwise secured thereon.

The opposite end portions of the cylinder 8 carry the surrounding anti-friction assemblies 24 for coaction with the interior wall of the pintle 1 whereby the cylinder 8 has its desired endwise movement with a minimum of frictional resistance while at the same time these anti-friction assemblies 24 serve to maintain the cylinder 8 in effective working position.

To further assure the effective functioning of our combined hinge and check a coil spring 25 of desired tension is positioned between the inner end of the cylinder 8 and the mounting 12 for the rod 11. This spring 25 serves to resist the inward movement of the cylinder 8 and thereby further retard the closing movement of the seat S.

The tubular pintle 1 is non-rotative within the ring 2 and to assure this assembly of the pintle 1 and ring 2 there is threaded through the ring 2, as particularly illustrated in Figure 4, a binding screw 26 which has holding engagement with the pintle 1.

While we particularly illustrate and describe our combined hinge and check used in connection with a toilet seat and bowl it is to be understood that it can be employed to equal advantage in connection with other relatively movable parts.

From the foregoing description it is thought to be obvious that a combined hinge and check constructed in accordance with our invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that our invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason we do not wish to be understood as limiting ourselves to the precise arrangement and formation of the several parts herein shown in carrying out our invention in practice except as hereinafter claimed.

We claim:—

1. A combined hinge and check comprising two members, a tubular pintle disposed through said members for connecting the same for relative swinging movement, a cylinder within the pintle having movement along the pintle, a stationary piston within the pintle and positioned within the cylinder, coacting means carried by the swinging member and the cylinder for endwise moving the cylinder upon swinging movement of said member, the second member having means coacting with the cylinder to hold the same against such rotation which would interfere with its desired endwise movement, said cylinder having an inlet port, and a check valve to close said port against outward flow therethrough, said cylinder being provided with a vent.

2. A combined hinge and check comprising two hinge sections, a tubular pintle operatively connecting said sections, a cylinder positioned within the pintle for endwise movement, a stationary piston within the pintle and positioned within the cylinder, a spiral channel in the periphery of the cylinder, a part carried by one of the hinge sections extending within said channel whereby the cylinder is moved endwise upon swinging movement of said hinge section, said cylinder having an inlet port, and a check valve to close said port against outward flow therethrough, said cylinder being provided with a vent.

3. A combined hinge and check comprising two hinge sections, a tubular pintle operatively connecting said sections, a cylinder positioned within the tubular pintle for endwise movement, a stationary piston within the pintle and positioned within the cylinder, a spiral channel in the periphery of the cylinder, a part carried by one of the hinge sections extending within said channel whereby the cylinder is moved endwise upon swinging movement of said hinge section, coacting means carried by the second hinge section and the cylinder to hold the cylinder against such rotation which would interfere with its endwise movement, said cylinder having an inlet port, and a check valve to close said port against outward flow therethrough, said cylinder being provided with a vent.

4. A combined hinge and check comprising two hinge sections, a tubular pintle operatively connecting said sections, a cylinder positioned within the tubular pintle for endwise movement, said cylinder having spiral channels reversely disposed, a part carried by one of the hinge sections extending within one of the channels whereby the cylinder is moved endwise upon swinging movement of said hinge section, a part carried by the second hinge section extending within the second channel to hold the cylinder against sub-

stantial rotation upon swinging movement of the first named section.

5. A combined hinge and check comprising two hinge sections, a tubular pintle operatively connecting said sections, a cylinder positioned within the tubular pintle for endwise movement, said cylinder having spiral channels reversely disposed, a part carried by one of the hinge sections extending within one of the channels whereby the cylinder is moved endwise upon swinging movement of said hinge section, a part carried by the second hinge section extending within the second channel to hold the cylinder against substantial rotation upon swinging movement of the first named section, the second channel having its pitch on a degree less than the degree of the pitch of the first channel.

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