Aug. 4, 1931. J. M. EVA 1,816,834

DOOR HINGE AND CHECK

Filed Nov. 3, 1930

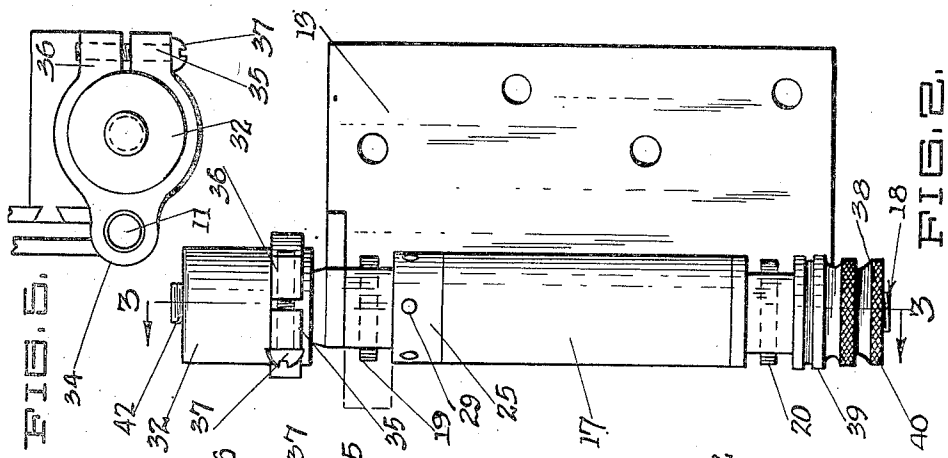


FIG. 2.

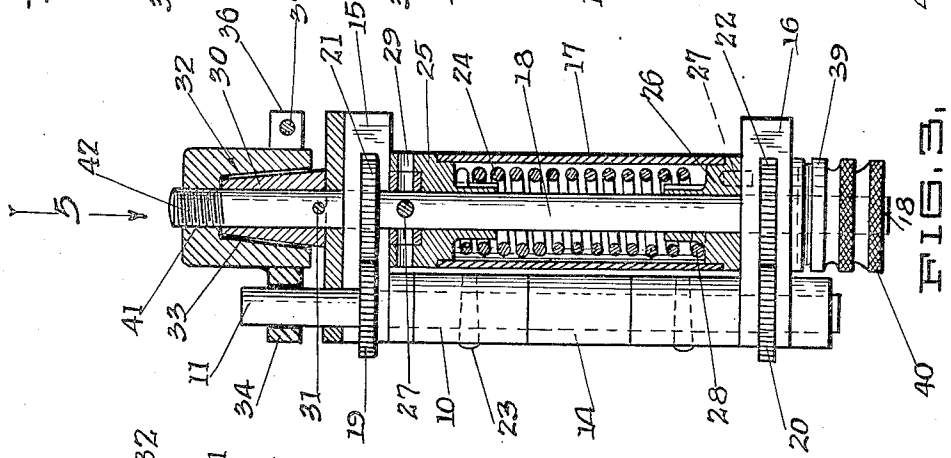


FIG. 3.

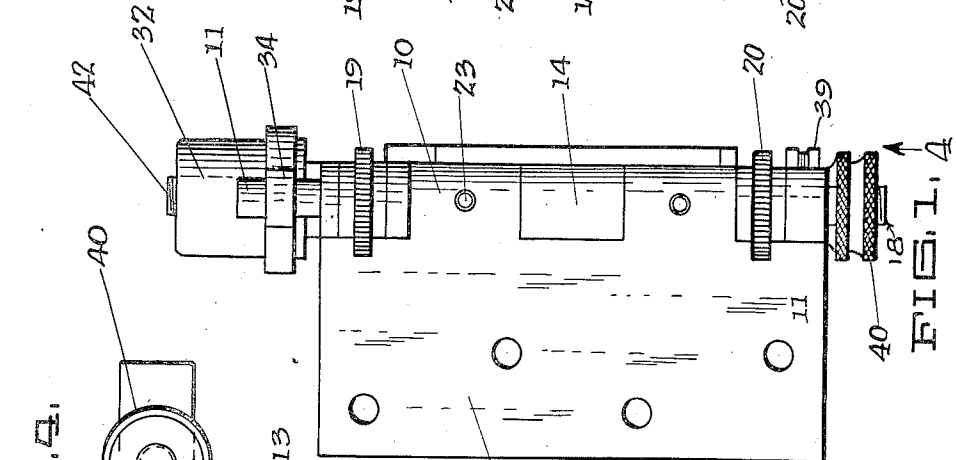


FIG. 1.

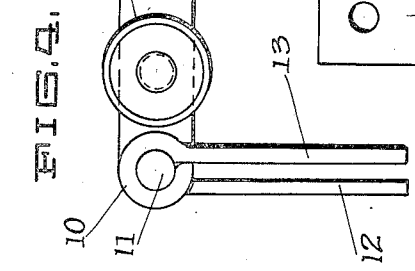


FIG. 4.

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UNITED STATES PATENT OFFICE

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DOOR HINGE AND CHECK

Application filed November 3, 1930. Serial No. 492,977.

The present invention relates generally to door hinges, but more particularly to combined door hinges and checks wherein the check part of the hinge is of frictional character.

The primary object of the present invention is to provide a door hinge having combined therewith a frictionally operated check member, which check member prevents the sudden return or slamming of the door in the jamb.

Another object of the invention is to provide a door hinge and check of the class described which is positive in action, simple in construction and that may be manufactured at a reasonable cost.

Still another object of the invention is to provide a hinge for doors and like closures which is very practical for hospitals and like places where it is of great importance to prevent the slamming of doors.

Other objects and advantages of the invention will become apparent with reference to the subjoined specification and the accompanying one sheet of drawings in which:

Figure 1 is an elevation showing my improved combined hinge and door check as it appears in position for use;

Figure 2 is an end elevation of the hinge and showing the attaching plates and check member;

Figure 3 is a vertical sectional view of the hinge and check member, the view being indicated by the line 3—3 in Figure 2;

Figure 4 is a bottom plan view of the hinge and check member; and

Figure 5 is a top plan view of the hinge member and its combined check.

Referring more particularly to the drawings and especially to Figures 1, 2, and 4, the hinge proper consists of hinge butts 10, pintle 11, attaching plates 12 and 13. The attaching plates 12 and 13, respectively, are secured in the usual manner to the door and the door jamb of the structure. The butts 14 are fixed as are the members 15 and 16 of the hinge.

A barrel 17 is mounted between the members 15 and 16 and is fixed relative thereto. A second pintle 18 operates in the barrel 17 and the pinions 19, 20, 21 and 22 are secured, respectively, to the pintles 11 and 18, these pinions meshing in pairs. The pintle 11 is pinned to the hinge butts 10 by means of pins 23, as shown in Figure 3.

A torsion spring 24 is mounted in the barrel 17 between the members 25 and 26. The member 26 is pinned to the member 16 by means of a pin 27 and the lower end 28 of the spring 24 is fixed to the member 26.

The pintle 18 is free to turn in the member 26 but the member 25 is fixed to the pintle by means of a pin 28 which may be adjusted to various openings 29 formed in this member, so that the tension of spring 24 may be accordingly varied.

The pintle 18 projects through the member 15 and is provided on its upper end with a cone, 30, which cone is fixed to the pintle by means of a pin 31. A second member 32 is mounted above the cone 30 and is provided with an interiorly arranged conical recess 33, these conical surfaces being ground to form a smooth fit.

The member 32 is prevented from turning by means of a lug 34 arranged at one side of said member and integrally formed with a ring and engaging the upper end of the pintle 11, the conical inner surface 33 of the member 32 being adjustable by means of split lugs 35 and 36 formed upon said ring and held in position by means of a screw 37.

The lower end of the pintle 18 is screw-threaded as indicated at 38 and is provided with a nut 39 and a jamb nut 40 on its lower end, these nuts normally being loose nuts relative to the pintle 18, but when it is desired to hold the door at any fixed position relative to the jamb the nuts 39 and 40 may be tightened up.

The operation of the device is as follows:

The spring 24 is normally under some tension but when the door is swung open the pinions 19 and 20 rotate the pinions 21 and 22 and the pintle 18 thus tending to put considerable tension on the spring 24, due to the fact that its lower end 28 is held fixed while its upper end is carried around by the member 25 which is secured to the pintle by the pin 28.

This rotating action of the pintle 18 causes the member 32 which is threaded in its upper end as indicated at 41 and which threaded section 41 operates on the threaded upper end 42 of the pintle, this action causes the member 32 to rise relative to the cone 30. On the return movement of the door the reverse action of the pintle 18 causes the member 32 to be again actuated to grip the cone 30, which action should take place at about the instant or slightly previous to the closing of the door.

The threaded upper end 42 of the spindle should be a fine pitch thread but, of course, this may be varied to suit to cause the quick or slower action of the member 32 in accordance with the conditions of the structure and the door to which it is hinged.

The principal object of the invention is that of providing a combined hinge and a door check of frictional character which is a substitute for the average hydraulic or like door check in common use. It is obvious that by combining the hinge and the check in the one article of manufacture great economy is thus established in both the article itself and in the time required for applying the same to the structure.

The conical check members of the hinge are of frictional type and these work to much better advantage than the hydraulic elements of the usual door check in that the hydraulic elements require continuous adjustment and the fluid leaks out at times and during the cold weather the fluid becomes very sluggish in action, thus requiring continuous attention.

The device of the present invention is extremely simple when compared with the usual door check and it also combines the hinge in the one article which is a great advantage in applying the device to any structure.

What I claim and desire to secure by Letters Patent of the United States is the following:

1. A combined door hinge and check of the class described comprising, a hinge member and a fixed check member associated with the hinge member, pintles for both members gear connected together, a spring surrounding the check member pintle and adapted to act to normally close the door, and a frictional check member carried by the upper end of the check spindle and adapted to normally check the return movement of the door against the spring urge.

2. A combined door hinge and check of the class described comprising, a hinge member and a fixed check cylinder associated with the hinge member, pintles for both members gear connected together, a spring surrounding the check member pintle and adapted to act to normally close the door, a cone fixed upon the upper end of the check spindle and a second member having a conical recess adapted to fit over the first mentioned cone, and means whereby the closing of the door causes the check spindle to draw the outer conical member down upon the fixed cone.

3. A combined door hinge and check of the class described comprising, a hinge member having attaching plates and a hinge pintle, a fixed check member associated with the hinge member and having a second pintle gear connected to the hinge pintle, a spring surrounding the check member pintle and having one end fixed and the other end secured to the pintle so that upon the opening of the door tension is placed upon the spring, a conical member pinned to the upper end of the check pintle and having a second member provided with a conical recess adapted to fit thereon, means for preventing the turning movement of the outer conical member, and means carried by the check pintle for drawing said outer member down tightly upon the cone.

4. A combined door hinge and check of the class described comprising a hinge butt and a fixed cylinder a pintle for said hinge and a spring actuated pintle for the check, gears connecting said pintles together and a frictional cone check associated with said check pintle.

5. A combined door hinge and check of the class described comprising, a hinge member and a fixed check cylinder associated with the hinge member, pintles for both members gear connected together, a spring surrounding the check member pintle and adapted to act to normally close the door, a cone fixed upon the upper end of the check spindle and a second member having a conical recess adapted to fit over the first mentioned cone, and means whereby the closing of the door causes the check spindle to draw the outer conical member down upon the fixed cone, and including means for the adjustment of the outer conical member relative to the inner conical member.

In testimony whereof I hereunto affix my signature.

JOSÉ M. EVA.