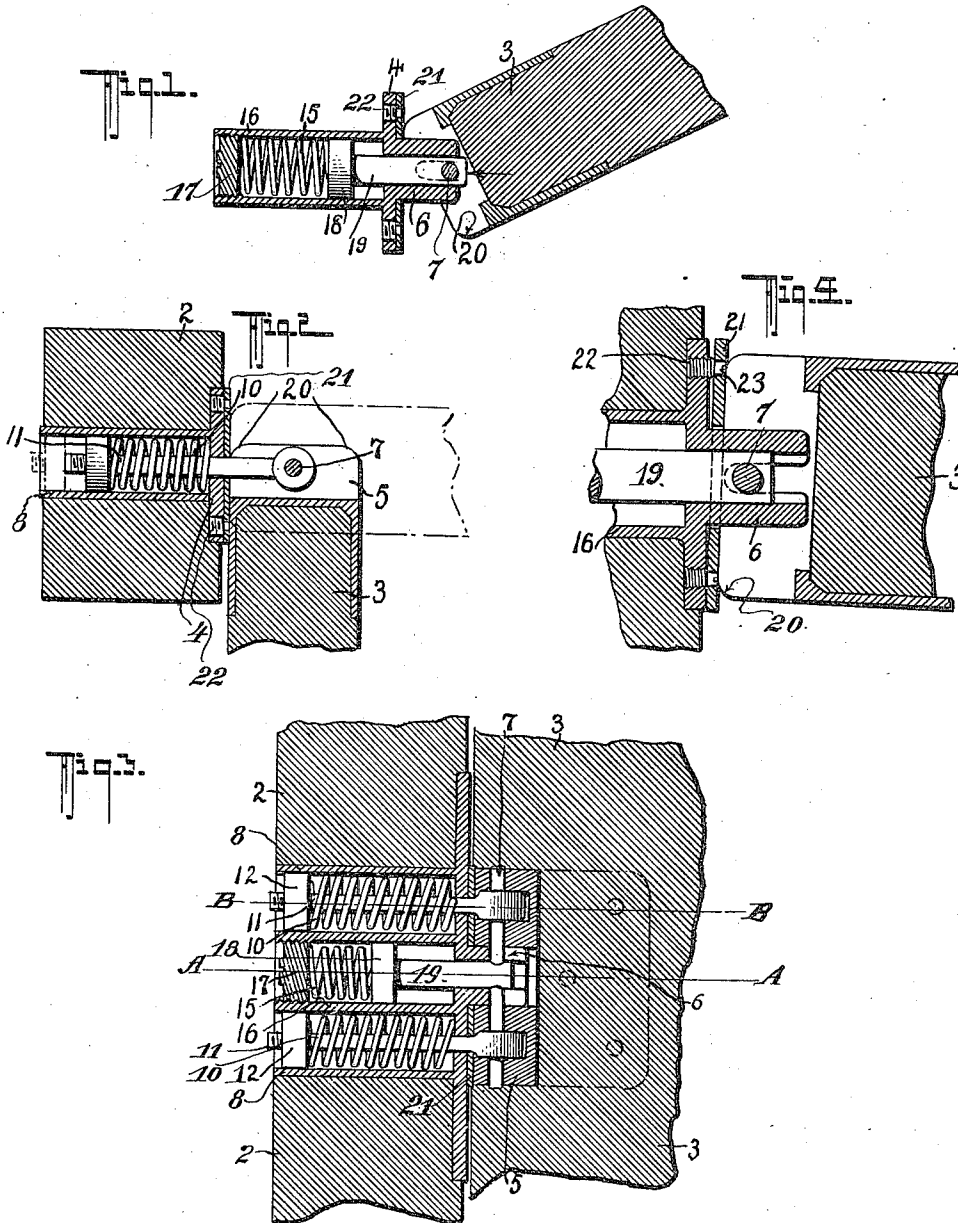


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 SPRING DOOR HINGE.
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SPRING DOOR-HINGE.

1,063,446.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, ROBERT HIGHET and DUNCAN G. McLENNAN, citizens of the Dominion of Canada, residing at Vancouver, in the Province of British Columbia, Canada, have invented a new and useful Spring Door-Hinge, of which the following is a specification.

This invention relates to a spring door hinge and belongs to that class wherein the door is required to open to either side and is closed to the mid-position by the action of a spring or springs in the body of the hinge itself.

As usually made, the door closing springs are within the door casing and are connected by rods to the hinge pin which is mounted in the mid-plane of the door.

That portion of the hinge, which is secured to the door, is of a thickness at least corresponding to that of the door, and when the door is opened it fulcrums on the corner of the door hinge on the side to which the door is being opened and draws the hinge pin away from the butt against the compression resistance of the spring.

It is one of the objects of our invention to provide the hinge with a supplemental check spring which opposes the door closing springs and checks the movement of the door as it approaches the closed position.

A further objection to hinges of the general class to which this invention belongs as usually made is that the correct position of the door within the plane of the door frame is adjusted by the fit of the hinge butt in the hinge stile of the door. A very slight variation in the fit of this butt plate on the frame will throw the door one way or the other out of its true position in the plane of the door frame and the door can only be brought to its correct position by removal and adjustment of the butt plates on the frame which is a tedious and unsatisfactory proceeding of trial and correction of error. This defect is overcome in the device, which is the subject of this application, by introducing a bearing plate between the butt plate of the hinge and the contact bearing of that portion of the hinge which is secured to the door, which bearing plate may be adjusted by screws in its relation to the plane of the butt plate. The particular means by which this and the foregoing improvement are effected is fully described in

the following specification, reference being made to the drawings by which it is accompanied, in which:

Figure 1 is a horizontal section through the hinge on the line A in Fig. 3, that is showing the check spring and its connection which is the particular subject of this application. Fig. 2 is a similar section on the line B in Fig. 3 showing the door closing device to which the check is applied. Fig. 3 is a vertical section through the hinge showing both the door closing and door checking devices, and Fig. 4 is an enlarged horizontal section through the hinge showing the supplementary adjustable butt plate.

In these drawings 2 and 3 represent respectively the stile of the door frame and of the door, to which stiles the hinge members 4 and 5 are secured. That portion 4, which is secured to the door frame and forms what is generally known as the butt plate of the hinge, has a projection 6, see Fig. 3, which in each hinge carries a proportion of the weight of the door, that that weight may not come on the hinge pin connection. This projection 6 fits into a corresponding recess in that portion 5 of the hinge, which is secured to the door. This portion 5 is approximate to the thickness of the door and the hinge pin 7 is secured in the mid-plane see Fig. 2.

Projecting from the back of the butt plate 4 are tubular spring casings 8 within which are the springs 10, which effect the closing of the door. These springs 10 are connected to the hinge pin 7 by rods 11 carried through the springs and having a washer 12 secured on the farther end between which and the butt plate the springs 10 are compressed as the door is opened, as shown in Fig. 2.

The corners of 5 are rounded, as at 20, and when the door is open to an angle of ninety degrees from the plane of the door frame, the pull of the springs falls within the rounded corner, as shown in Fig. 4, so that the springs will hold the door in the open position, but will tend to close the door, as shown, as the angle of the door is such that the pull of the springs falls outside of the line of contact of the hinge member 5 on the butt plate, or its interposed bearing plate, which will be described later. These door closing springs act to draw the door into the closed position from either side.

The application of the check spring 15, which is the particular subject of this application, is to check the movement of the door before it reaches the closed position and enables it to come quietly to rest. It is inserted in a casing tube 16 projecting from the back of the butt plate 4 in the same manner as the closing springs and is compressed during the closing of the door between a plug 17 adjustable in the end of the spring casing 16, and a piston 18 connected by a rod 19 to the hinge pin 7 so that while the closing springs 10 are compressed against the butt plate during the opening movement of the door, the check spring is compressed against the plug 17 during the closing movement. The momentum of the closing door is thus absorbed and the door brought quietly to rest, not only lessening the wear and tear on the hinge and its connected parts but avoiding the annoyance of the door swinging back and forth when a person passes through.

A further important improvement directed to the adjustment of the door to the plane of the door frame, consists in the introduction of the adjustable bearing plate 21, which is shown in enlarged detail in Fig. 4. This plate, which is preferably of steel, is apertured to permit the passage through it of the spring rods 11 and 19 and to pass over the projection 6. It will initially bear upon the face of the butt plate 4 and is adjusted thereto to attain the desired result by screws 22 threaded into the butt plate and shouldered at 23 to fit a smaller aperture in the bearing plate. The smaller end of these screws is notched for the application of a screw driver by which the plane of the plates may be adjusted to the plane of the butt plate 4 by withdrawing the screws on one side, as shown in Fig. 4. This bearing plate is an important and advantageous improvement to the hinge as it enables the door to be adjusted without disturbing the attachment of the hinge to the door or the door frame.

Having now particularly described our invention, we hereby declare that what we claim as new and desire to be protected in by Letters Patent, is:

1. In a door hinge, a hinge member adapted to be secured to the door frame, a hinge member adapted to be secured to the door, a connection between said hinge members which includes a hinge pin located in the mid-plane of the door and door frame in virtue of which said door may be swung to either side of said mid-plane, door closing springs coöperatively connected with said hinge pin for closing the door, and a checking spring coöperatively connected with said hinge pin for checking the action of said closing springs as the door approaches the mid-plane of the door frame.

2. In a door hinge of the class described, a butt plate having a rearwardly projecting chambered housing insertible into a recess in the door frame, a projection extending forwardly from the said butt plate and having a passage, a second butt plate securable to the door and having a recess to receive said projection, a hinge pin carried by said door butt plate and passing through said projection passage, said projection having an elongated slot to receive said hinge pin, resilient means mounted in said housing and connected with said pin for continuously tending to draw said pin toward said door frame butt plate, and other means mounted in said housing and connected with said pin for opposing the action of said continuously tending means at predetermined times.

3. A door hinge including a hinge member attached to the door, and a hinge member attached to the door frame, said hinge members each including butt plate portions and interprojecting portions, said interprojecting portions being located in the mid-plane of the door and frame when the door is closed, a hinge pin projecting through said interprojecting portions in virtue of which said door may be swung to either side of the door frame, means continuously tending to hold said butt plate portions in contact, means for adjusting the door within the plane of the door frame, said means comprising a bearing plate interposed between the butt plate portions of said hinge members, and means for adjusting said bearing plate in relation to the plane of one of said butt plate portions.

4. A door hinge including a hinge member attached to the door, and a hinge member attached to the door frame, said hinge members including butt plate portions and interprojecting portions, said interprojecting portions located in the mid-plane of the door and frame when the door is closed, a connection between said hinge members and including a hinge pin projecting through said interprojecting portions in virtue of which said door may be swung to either side of the door frame, means continuously tending to hold said butt plate portions in contact, means for adjusting the door within the plane of the door frame, said adjusting means comprising a bearing plate interposed between said butt plate portions, screws threaded into one of said butt plate portions and having shouldered ends passing through said bearing plate in virtue of which the plane of said bearing plate may be changed with relation to the plane of the butt plate portion to which it is attached.

5. In a door hinge of the class described, having door closing springs connected by rods to the hinge pin of the door, the combination therewith of a check spring within a

casing secured to the butt plate, a plug closing the end of the casing and endwise adjustable therein and a rod connected to the hinge pin and having a piston secured to it
5 and bearing on the spring.

6. In a door hinge of the class described, having door closing springs connected by rods to the hinge pin of the door, a check spring within a casing secured to the butt
10 plate, a plug screwed within the end of that casing, and a rod connected to the hinge pin

having a piston secured to its end to bear against the spring within the casing.

In testimony whereof we have signed our names to this specification in the presence 15 of two subscribing witnesses.

ROBERT HIGHET.
DUNCAN G. McLENNAN.

Witnesses:

ROWLAND BRITAIN,
MAY WHYTE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."