

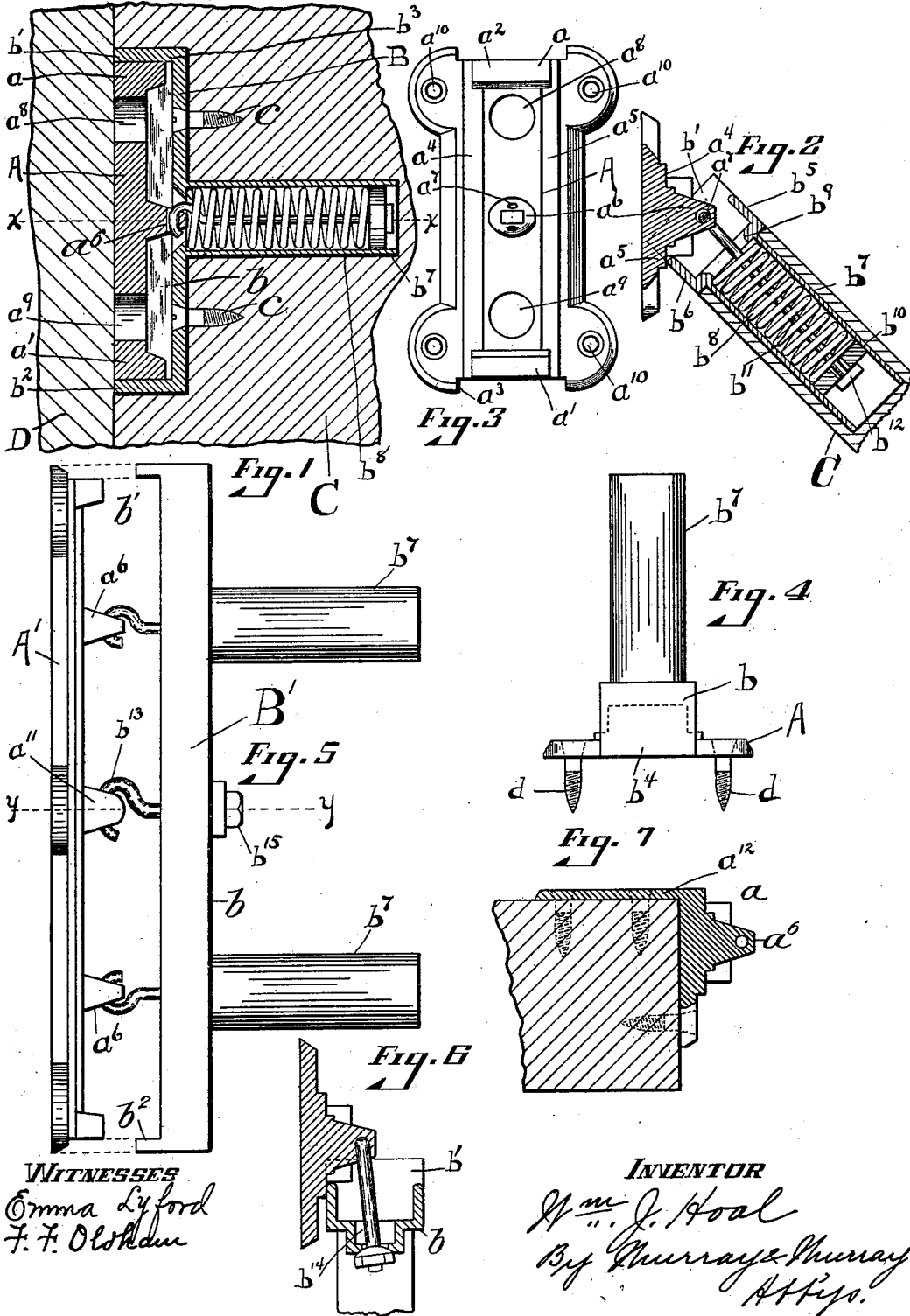
No. 667,166.

Patented Jan. 29, 1901.

W. J. HOAL.
SPRING HINGE.

(Application filed Apr. 9, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

WILLIAM J. HOAL, OF COVINGTON, KENTUCKY, ASSIGNOR TO WATSON W. TRANTOR, TRUSTEE, OF SAME PLACE.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 667,166, dated January 29, 1901.

Application filed April 9, 1900. Serial No. 12,098. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. HOAL, a citizen of the United States of America, and a resident of Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Spring-Hinges, of which the following is a specification.

The object of my invention is a spring-hinge which while allowing the door to swing freely, yet keeps it from sagging and returns it to its normal position with no perceptible oscillation, in which the spring is not affected by the weight of the door and is not subjected to any torsional strain, and in which the parts may be coupled up before their attachment to a door and jamb, so that so coupled they may be readily secured to the door and jamb. These objects are attained by the means described in the annexed specification and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal central sectional view of a hinge embodying my invention attached to a door and door-jamb, the door being shown in its normal or closed position. Fig. 2 is a horizontal sectional view taken upon line xx of Fig. 1, but with the parts shown in the position they occupy when the door is partially opened. Fig. 3 is a detail front elevation of the jamb-plate of the hinge. Fig. 4 is an end elevation of the hinge in the position shown in Fig. 1. Fig. 5 is an edge elevation of the jamb-plate and door-leaf of a double form of hinge before the spring and piston have been put in place, showing the manner of fitting the parts together, the jamb-plate and leaf being shown supplied with a check-bar for limiting the path of rotation of the door to protect the spring, piston, and rod from undue strain. Fig. 6 is a horizontal sectional view taken through line yy of Fig. 5, but showing the parts in the position they occupy when the door has reached its limit of rotation in one direction. Fig. 7 is a horizontal sectional view of a modification of the jamb-plate to fit it to a gate-post.

Referring to Figs. 1 to 4, inclusive, jamb-plate A has at its ends outwardly-projecting lugs a and a' to fit within the rectangular box b of the door-leaf B and rectangular recesses

a^2 and a^3 to pass the flanges b' b^2 , which project inward from the ends b^3 b^4 of box b beyond its sides b^5 b^6 , which bear upon parallel ledges a^4 a^5 of the jamb-plate. Formed integral with door-leaf B is a rearwardly-extending cylindrical casing b^7 , within which is seated a coiled spring b^8 between an inner annular flange b^9 at the inner end of the casing and a piston b^{10} , which is coupled by piston-rod b^{11} to a perforated stud a^6 , which is formed integral with jamb-plate A. Perforation a^7 in stud a^6 is made at a distance from the plane of the ledges a^4 a^5 equal to one-half the width of box b , so that when door-leaf B has been rotated to a point ninety degrees from the normal position piston-rod b^{11} coincides with the axis of casing b^7 .

In putting my hinge together the hooked end of piston-rod b^{11} is passed through perforation a^7 in stud a^6 . Door-leaf B is then placed down upon jamb-plate A, flanges b' b^2 passing into recesses a^2 a^3 and piston-rod b^{11} into casing b^7 through its outer open end. Coiled spring b^8 is then placed in the casing and piston b^{10} is secured upon its rod by a nut b^{12} .

In applying my hinge to a door its parts are not separated. Door-leaf B, coupled up to jamb-plate A, as described, first is secured to a door C, perforations a^8 a^9 in jamb-plate passing a screw-driver for driving screws c into the door. After the hinges have been secured to the door it is held against jamb D while screws d are driven through screw-holes a^{10} into jamb D. Door-leaf is set back into the door a distance such that the inner edges of flanges b' b^2 are flush with the inner edge of the door. Jamb-plate A is not set into the jamb, but is secured to its face, leaving its surface unmarred.

In Figs. 5 and 6 is shown a modification in which jamb-plate A' and door-leaf B' are lengthened, jamb-plate being provided with two studs a^6 and door-leaf with two casings b^7 for receiving springs, pistons, and piston-rods, as described. Jamb-plate B' has a central perforated stud a^{11} , into which is hooked a check-bar b^{13} , which projects through a perforation b^{14} in the door-leaf and terminates upon the back in a nut b^{15} . Bar b^{13} is made of a length such that when the door-leaf has been swung to a position in either direction

at an angle of ninety degrees to its normal position the nut bears upon the back of the door-leaf and checks any further rotation thereof, in this manner protecting the spring, piston, and piston-rod from any wrench.

In Fig. 7 is shown a modification of the jamb-plate to adapt it for use upon a gate-post. Upon one side screw-holes a^{10} are omitted and the plate provided with a flange a^{12} , projecting rearwardly at a right angle to the plate to fit against the side of the post.

In applying my hinges to a door it is found best with heavy doors to use for the upper hinge a double one of the form shown in Figs. 5 and 6 and for the lower one the form shown in Figs. 1 to 4.

In use it is seen that the weight of the door will be borne by the flanges b' of the door-leaf bearing down upon the lugs a of the jamb-plate, so that the spring, the piston, and the piston-rod are not affected by the weight of the door, that in the door there will be no sagging, and that in rotating the sides b^5 b^6 of box b are held in contact with ledges a^4 and a^5 and lugs a a' of the jamb-plate by the spring.

What I claim is—

1. The combination in a spring-hinge of the character described of the jamb-plate having outwardly-projecting ends and centrally-projecting eye-stud, the open-box door-leaf to receive the jamb-plate and having projecting centrally and rearwardly therefrom a tubular case, the piston to slide in said tubular case, the piston-rod to couple the door-plate to the jamb-plate, and a coiled spring compressed between the piston and the rear wall of the door-leaf, substantially as shown and described.

2. In a spring-hinge the combination of a jamb-plate with outwardly-projecting lugs at its end with an outwardly-projecting perforated stud and with perforations between the lugs and the stud, a door-leaf to set down on the jamb-plate with inwardly-projecting flanges to bear upon the outer sides of the lugs to take the weight of the door with a cylindrical casing to come opposite the stud and with screw-holes opposite the perforations in the jamb-plate, a coiled spring seated within the casing, a piston at the outer end of the spring and a rod coupling the piston and the stud, substantially as shown and described.

3. The combination in a spring-hinge of the jamb-plate having a centrally-projecting perforated stud, a centrally-perforated door-leaf consisting of a rectangular case to fit over the jamb-plate and having flanges extending beyond its side walls and having a cylindrical casing larger than the perforation and surrounding it, a piston fitted to slide in said casing, a piston-rod having a hook at one end to enter the perforation in the jamb-plate to

couple the jamb-plate and door-plate together and screw-threaded and provided with a nut at the opposite end to adjust the piston nearer to or farther from the jamb-plate, and a coiled spring compressed between said piston and the bottom of the door-plate, substantially as shown and described.

4. In a spring-hinge the combination of a jamb-plate having outwardly-projecting lugs at its end an outwardly-projecting perforated stud at its center and perforations between the stud and the lugs, a door-leaf consisting of a rectangular casing to set down on the jamb-plate over said lugs and stud having inwardly-projecting flanges at its ends to bear down on the lugs, screw-holes in the back of the casing opposite the perforations in the jamb-plate for convenience in securing the leaf to the door and a cylindrical casing opposite the perforated stud, a coiled spring seated in the casing, a piston at the outer end of the spring and a piston-rod coupling the stud and the piston, substantially as shown and described.

5. The combination in a spring-hinge of the character described of the jamb-plate having longitudinal ledges outwardly-projecting flanged ends between the ledges and a centrally-perforated stud, the open-box door-leaf having its sides arranged to fit over the ledges on the jamb-plate and having inwardly-projecting flanges to pass over the flanged ends of the jamb-plate and being centrally perforated and provided with a cylindrical casing larger than the perforation in the bottom of the door-plate, the piston to slide in the said casing, a piston-rod hooked at one end and screw-threaded at the opposite end to pass through said piston and engage the perforated lug on the jamb-plate, the coiled spring compressed between the piston and door-plate, and the nut for adjusting the tension of the spring, substantially as shown and described.

6. In a spring-hinge the combination of a jamb-plate having outwardly-projecting lugs at its ends and outwardly-projecting perforated studs between said lugs, a door-leaf consisting of a rectangular casing to set down on the plate having inwardly-projecting flanges to bear against the outer faces of the lugs to take the weight of the door, a check-bar coupled to one of said perforated studs passing through a perforation in the door-leaf and terminating in a nut for limiting the rotation of the door, cylindrical casings upon the leaf opposite the other perforated studs, a spring seated in each of the casings, a piston bearing upon each spring and a piston-rod coupling the piston with the stud opposite, substantially as shown and described.

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Witnesses:

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