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A. S. HELD & L. PATTERSON.

SPRING HINGE.

No. 484,200. Patented Oct. 11, 1892.

Fig. 1.

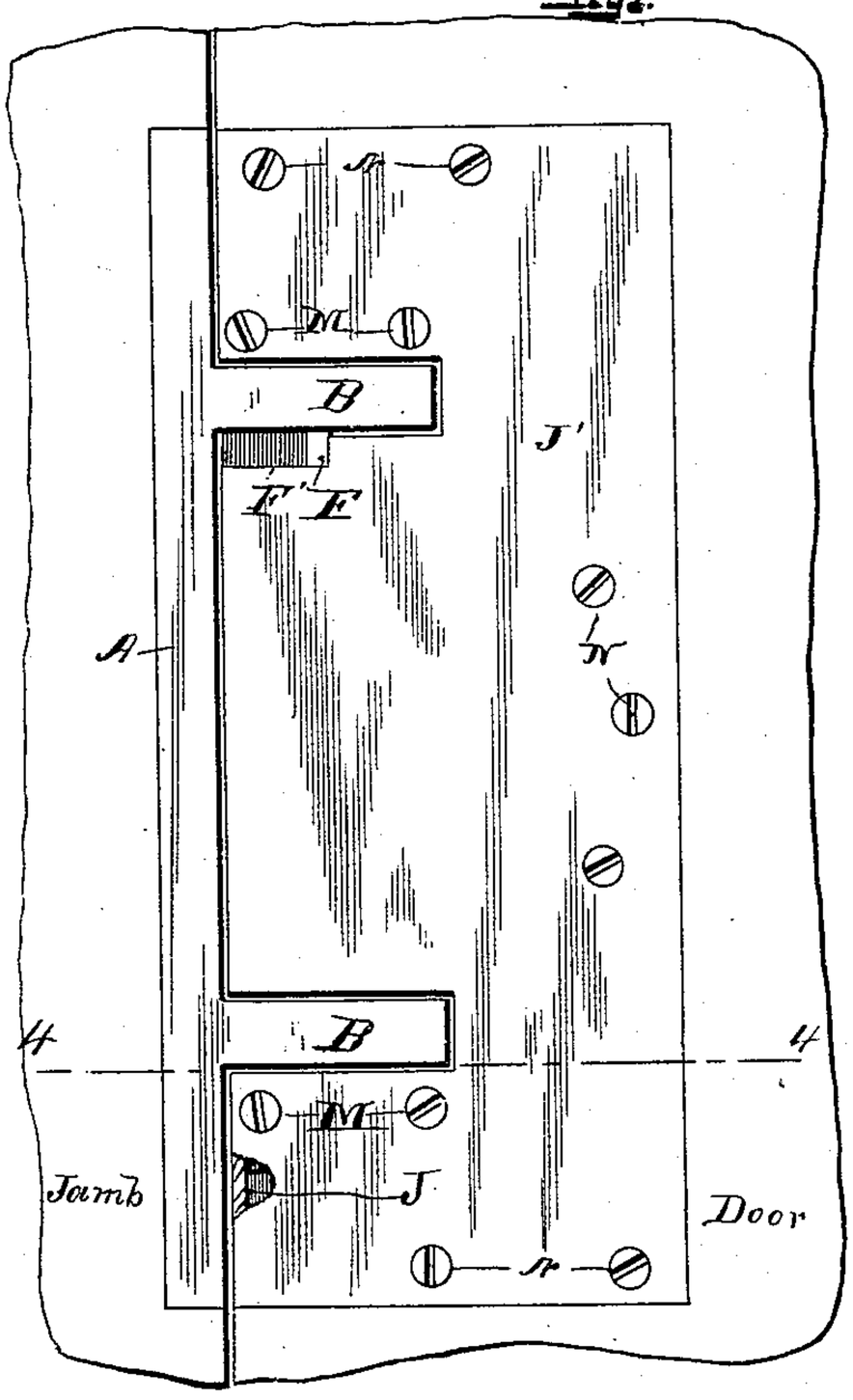


Fig. 2.

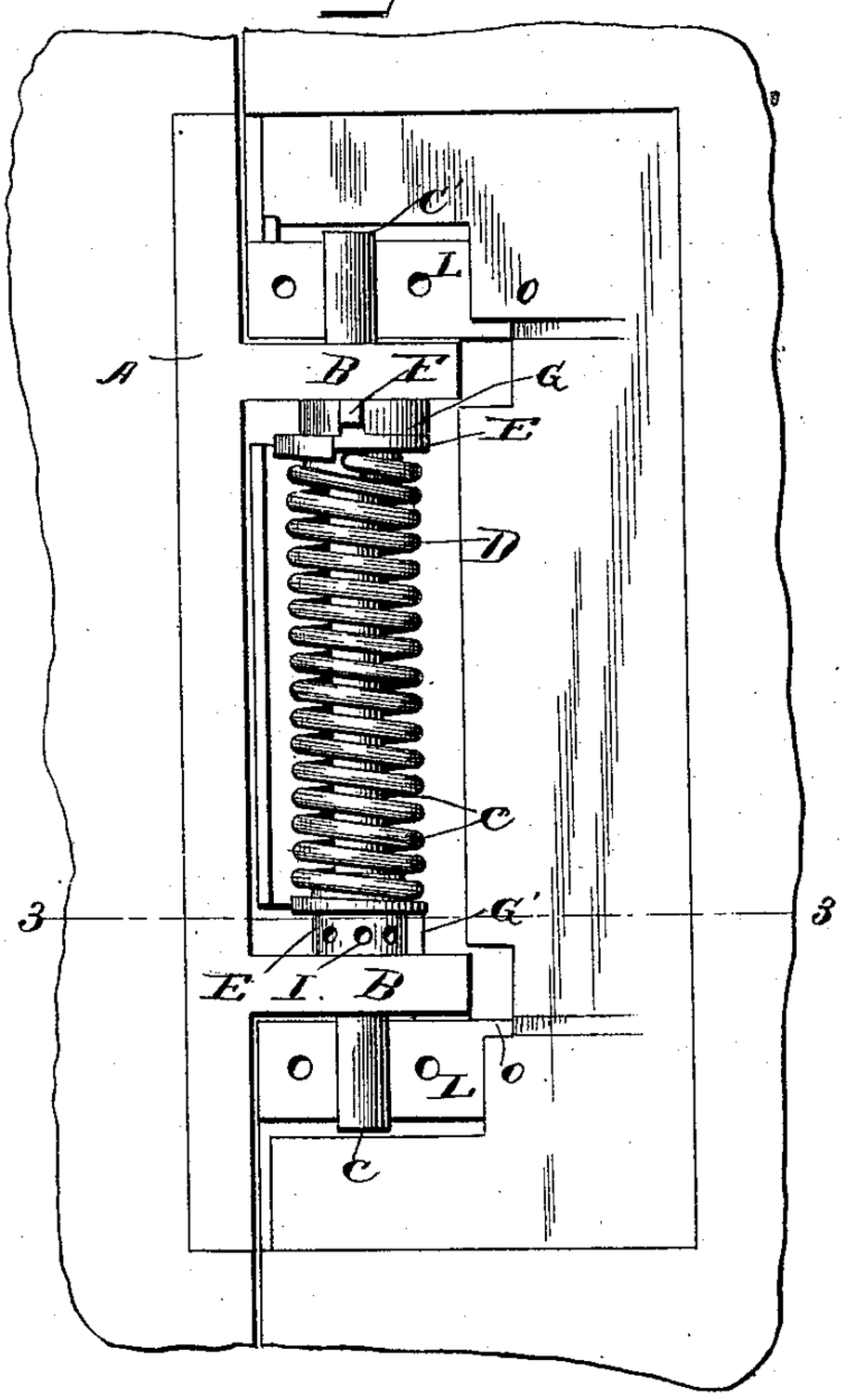


Fig. 3.

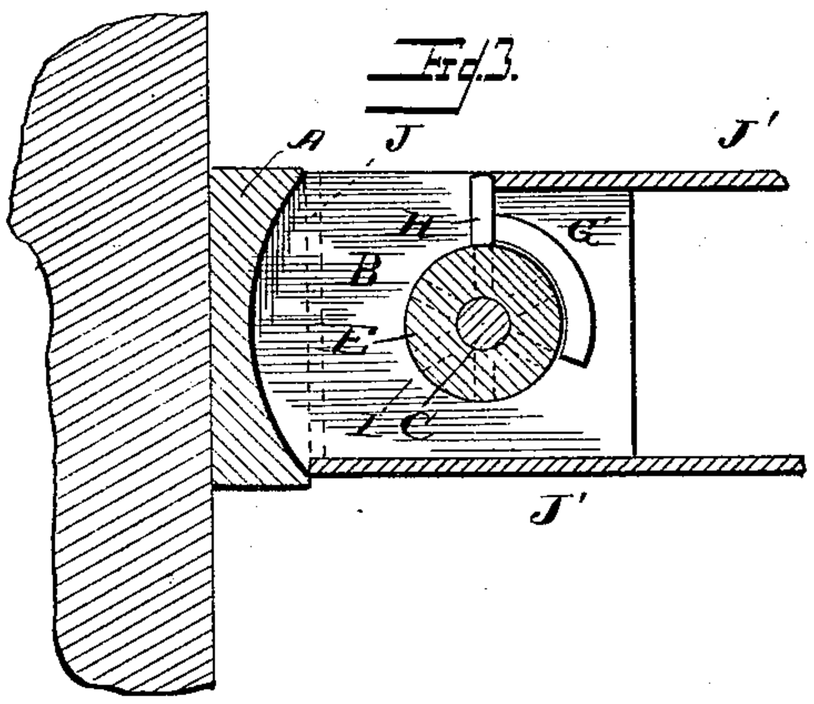
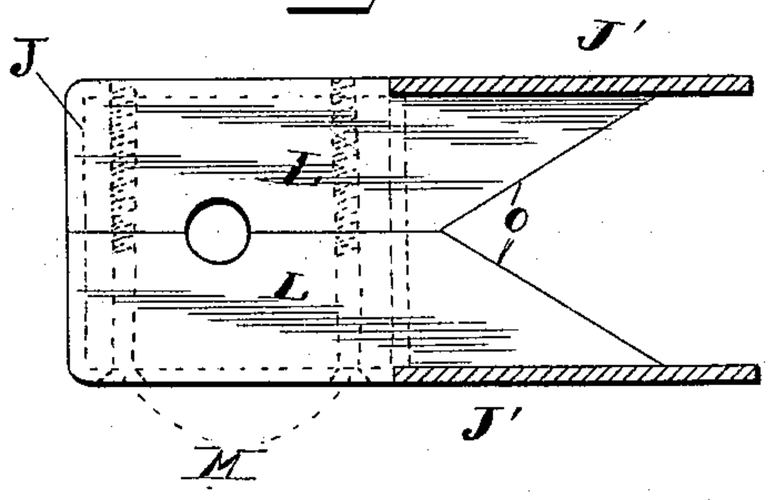


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.

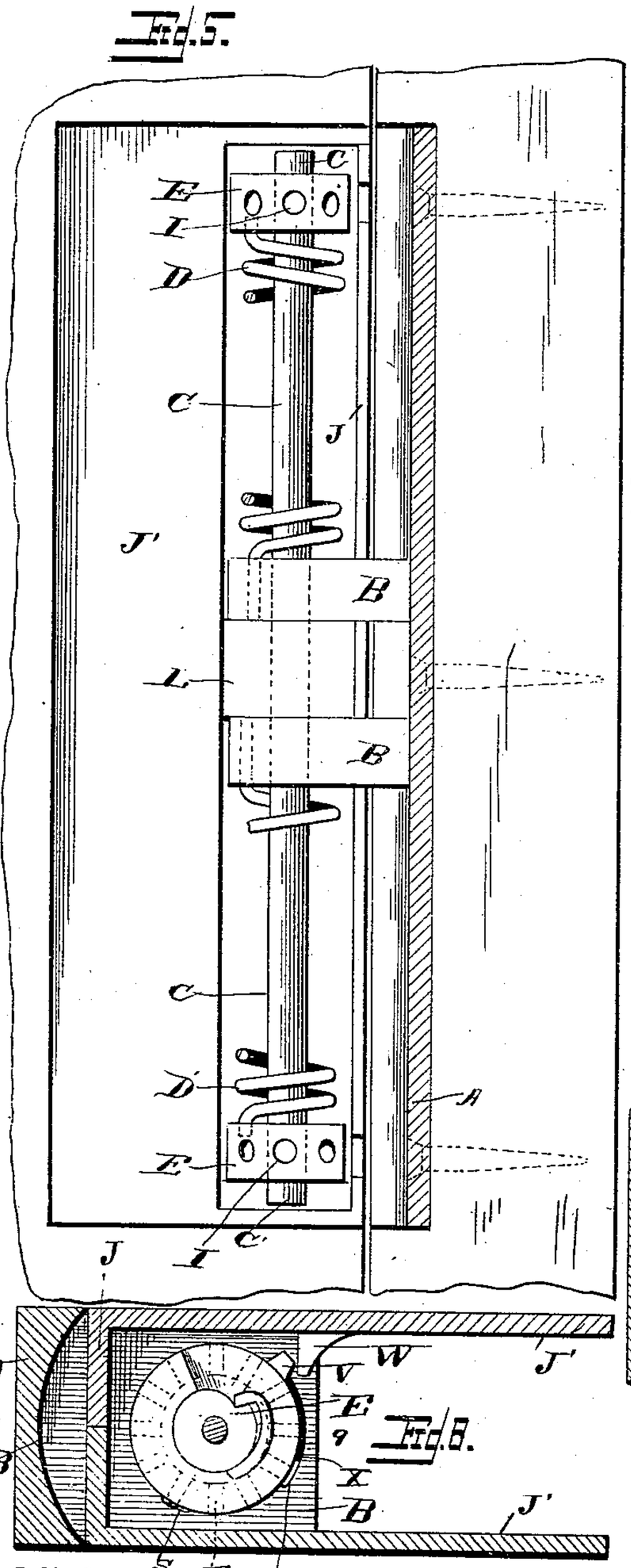

Fig. 6.

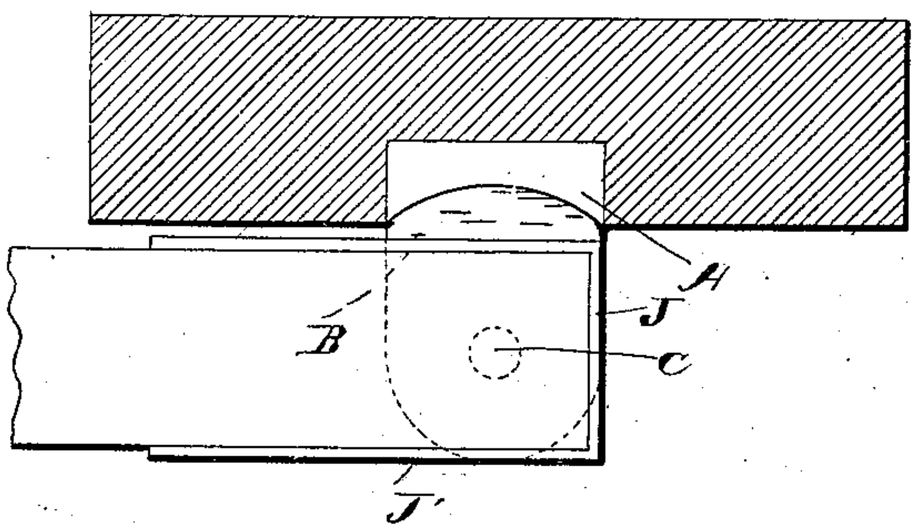

Fig. 7.

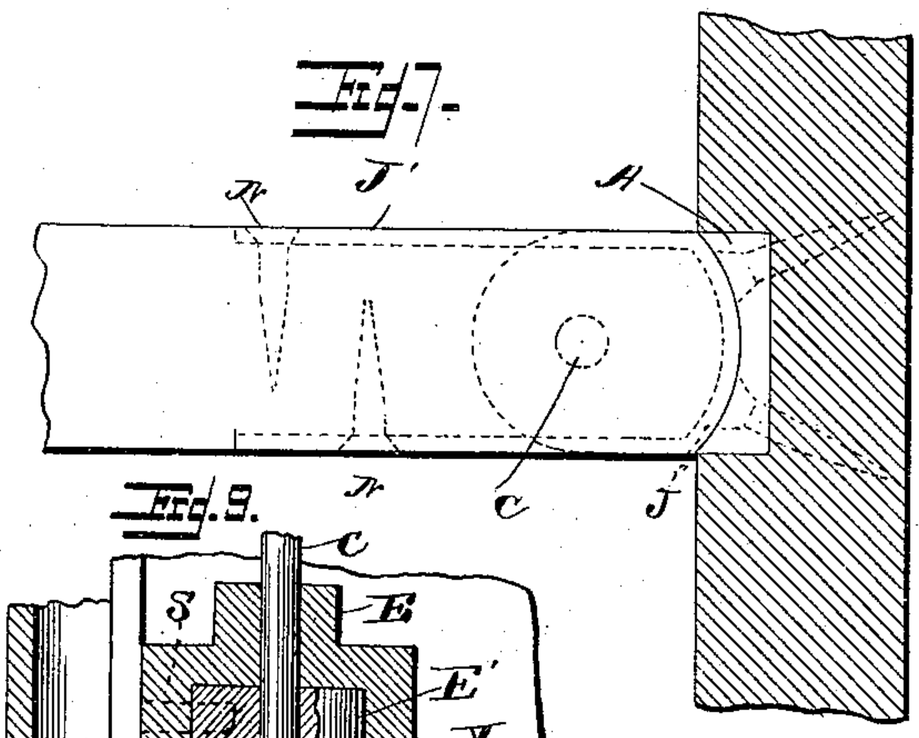

Fig. 9.

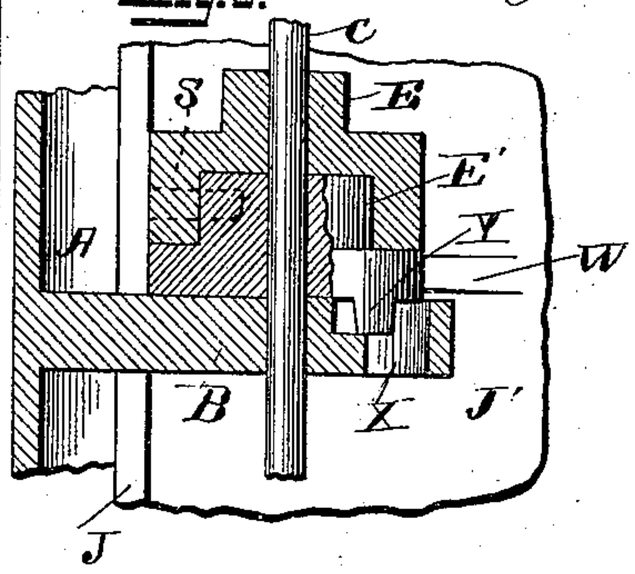

Fig. 8.

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SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 484,200, dated October 11, 1892.

Application filed March 25, 1892. Serial No. 426,430. (No model.)

To all whom it may concern:

Be it known that we, AUGUST S. HELD, a resident of Freeport, in the county of Stephenson and State of Illinois, and LEMUEL PATTERSON, a resident of Allegheny, in the county of Allegheny and State of Pennsylvania, citizens of the United States, have invented certain new and useful Improvements in Spring-Hinges; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

The object of this invention is to produce a simple and convenient spring-hinge that shall allow the door to open in both directions.

A further object is to secure such a hinge that shall have its spring entirely unconnected with one of the leaves, so that the latter may be detached or attached without disturbing the spring, and, further, to secure a hinge that allows the use of a square-edged door, yet leaves no open space between the door and jamb.

Figure 1 is a side view of the hinge in place. Fig. 2 is a like view, certain parts being removed. Fig. 3 is a section on the line 3 3, Fig. 2. Fig. 4 is a section on the line 4 4, Fig. 1. Fig. 5 is a view like Fig. 2, but of a modified form. Fig. 6 shows the door open and seen from above. Figs. 7, 8, and 9 show other slight modifications.

In the drawings, A J are two contiguous leaves at right angles to the plane of the door. The leaf J bears lugs or short arms L upon its rear or inner face, and the leaf A bears longer arms B, that extend through the leaf J and lie between and contiguous to the lugs L. A vertical pintle C C′ passes through both lugs and arms, pivotally connecting the two leaves. Between the arms B a heavy spring D is coiled about the pintle and has its ends respectively in engagement with buttons E, that rotate upon the pintle. One of the buttons has a projecting lug F and the other a corresponding removable pin or stud H, and these normally rest, respectively, against projections G G′ upon the lugs L, which thus prevent uncoiling of the spring. Tension is adjusted by placing the stud H in one or the other of several radial apertures I in its button, and in whichever aperture the stud is placed it serves at this end of the spring the same purposes as the lug F at the opposite end, in addition to its function in the matter of adjustment. It is then in effect a lug that may be fixed at any one of several points upon the circumference of the button, while the lug F is fixed with reference to its button, there being no reason for adjusting both ends of the same spring. As the leaves A J are contiguous, the former, which is secured upon or in the jamb by screws, is given a cylindrically-concave face, so that opening the door may be possible. The leaf J is provided at its margins with broad flanges or plates J′, to be fixed in the opposite faces of the door by screws N, and is also vertically divided in a plane parallel to that of the door and passing through the axis of the pintle. Its two parts are united by screws M. Fig. 2 shows this leaf with the half nearest the observer removed. These flanges or plates are cut away, as shown in Fig. 1, for the arms B, which are flush with their outer faces and with the surfaces of the door. They are also cut away at F′, Fig. 1, (and upon the opposite face of the door in the same way,) to receive the ends of the lug F and the stud H, each of which is preferably long enough to project through the corresponding flange or plate. Now if the door swings toward the observer in Fig. 1 the plate J′ carries the lug F with it and imparts torsion to the spring at its upper end, the stud H meantime remaining stationary against its retaining projection G′, Fig. 3. If the door swings in the contrary direction, the stud H, Fig. 3, is caught by the plate J′ and torsion is imparted to the lower end of the spring, while the lug F remains fixed and resting against the projection G, Fig. 2. The two plates are slotted from the lug and stud upon the side toward the door's edge, (see Figs. 1 and 3,) so that neither is caught by the plate J′, except when the door swings toward the side upon which the lug or stud lies. The parts are so placed that the halves of the door-leaf J are symmetrical and interchangeable. Evidently if the screws N be withdrawn the

door may be removed, leaving all parts of the hinge unmoved, and it is equally obvious that if the screws M be withdrawn and the screws N be removed from one flange or plate J′ only the door may be removed with equal facility, leaving the spring still fully mounted and adjusted upon the leaf A. The two leaves then may be fitted separately and all but the one-half of the door-leaf be secured in place and adjusted. The door is then supported upon the arms B and the other plate is laid in place. If the screws M be then inserted to bind the parts of the leaf together, the door is ready for use; but for greater security the screws N of Fig. 1 are also inserted, securing this plate, also, directly to the door.

Fig. 5 shows the modification of using two springs, one upon each end of the pintle-rod, outside the arms, which in this case are preferably brought nearer together, and one lug instead of two is made to fill the space between them. The operation is the same as before, except that the one coil has practically been divided and secured in the middle, so that strain at either end affects but half the coil—that is, one of the coils of this form. The ends of the arms B may be rounded, as in Fig. 6, and the leaf J may be convex, as in Fig. 7, to fit the concavity of the leaf A, the door being also rounded; but this is unnecessary, since in the main form no open passage from side to side of the door exists.

Fig. 7 is a section just above the lower end of the spring, and Fig. 9 is a central vertical section, partly in elevation, showing the modification below described.

The button is made in two parts E E′, joined to rotate as one by a stud S, passing through one of a series of apertures in the part E′ into an aperture in the part E. The part E being rotated till the desired tension is obtained, the stud is inserted in that aperture in E′ that then registers with the aperture in E. The part E′ is provided with a downwardly-extending lug Y, that moves in a partial annular slot X in the arm, and also with a nearly-radial lug V, that lies in the path of a projection W upon one of the flanges or plates J′. When the door swings in one direction, the projection W catches the lug V and carries it around the pintle, imparting torsion to the coil, the lug Y at the same time swinging in its slot X. If the door swings in the opposite direction, the projection W leaves the lug V, and the lug Y, resting against the end wall of its slot X, prevents uncoiling of the spring, while at the opposite end of the coil there is, as in the main form, a reverse arrangement of parts, whereby torsion is imparted at that end. In other words, if the door swings in either direction torsion is applied at one end of the spring, while the opposite end is held stationary.

It is obvious that other changes may be made in many details, while preserving the more important differences between this and other hinges of the same class. For example, the projections upon the arms B may be differently located even upon the body of the leaf A, and the leaf J, with its flanges, may be in one piece and may be stamped from sheet metal, this construction being peculiarly adapted for the use of sheet metal. The device for varying tension may be omitted, the stud H, which is merely an adjustable lug, being replaced by a lug like that at the opposite end of the spring.

In all the forms the concave jamb-leaf A is preferably used, and it should be sunk into the jamb, so that its lateral edges are flush therewith, or should be screwed directly upon its flat face. In new work the former course is preferred and the concavity of the leaf is continued in the jamb itself from top to bottom of the door. In the other case a molding having the same cross-section as this leaf is secured to the jamb, so as to form a continuation of the leaf to the top and bottom of the door.

What we claim is—

1. The combination, with a jamb-leaf having rigid arms projecting in the plane of the door and bearing a pintle, of a spring mounted upon said pintle, lugs arranged to impart tension to the spring at its opposite ends, respectively, stops to hold the spring at all times under tension, and a separable door-leaf adapted to clasp the pintle and operatively engage said lugs, whereby the door may be removed or replaced by separating the parts of its leaf and without disturbing any other parts.

2. The combination, with a leaf bearing a pintle, of a second leaf having the same pintle and divided along the line of that pintle and means for detachably uniting the parts of the divided leaf, whereby the leaves may be detached by separating the parts of one of them.

3. The combination, with the door-leaf and its attaching-flanges adapted to lie, respectively, in three faces of a door, of the concave jamb-leaf contiguous to the door-leaf and having rigid arms extending through the latter, a pintle mounted in said arms, and a spring coiled about the pintle and arranged to be operatively engaged by the door-leaf when the latter swings from its normal position.

4. The combination, with the door-leaf and its attaching-flanges adapted to lie in and flush with three faces of a door, of a concave jamb-leaf having rigid arms equal in width to the door's thickness and projecting through the door-leaf and a pintle mounted in said arms equidistant from the sides and ends of each and operatively connecting the two leaves, whereby whether the door be fully open in either direction or be closed the sides and ends of the arms form continuations of the faces of the door-leaf and its flanges.

5. The combination, with the jamb-leaf bearing the pintle and the stops for resisting

the uncoiling of a spring and the spring coiled about the pintle and provided with the end buttons having each a projecting lug, one being adjustable, of a door-leaf swinging upon said pintle against one or the other of said lugs, according to the direction of its motion, said door-leaf being divided along the line of the pintle and provided with devices for securing its parts together.

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

AUGUST S. HELD.
LEMUEL PATTERSON.

Witnesses for A. S. Held:
W. H. J. STRATTON,
L. HUGHES.
Witnesses for Lemuel Patterson:
J. H. LAUZ,
F. PATTERSON.