(No Model.) 2 Sheets—Sheet 1.

H. A. RIPPIEN.

SPRING HINGE.

No. 527,158. Patented Oct. 9, 1894.

Fig. 1.

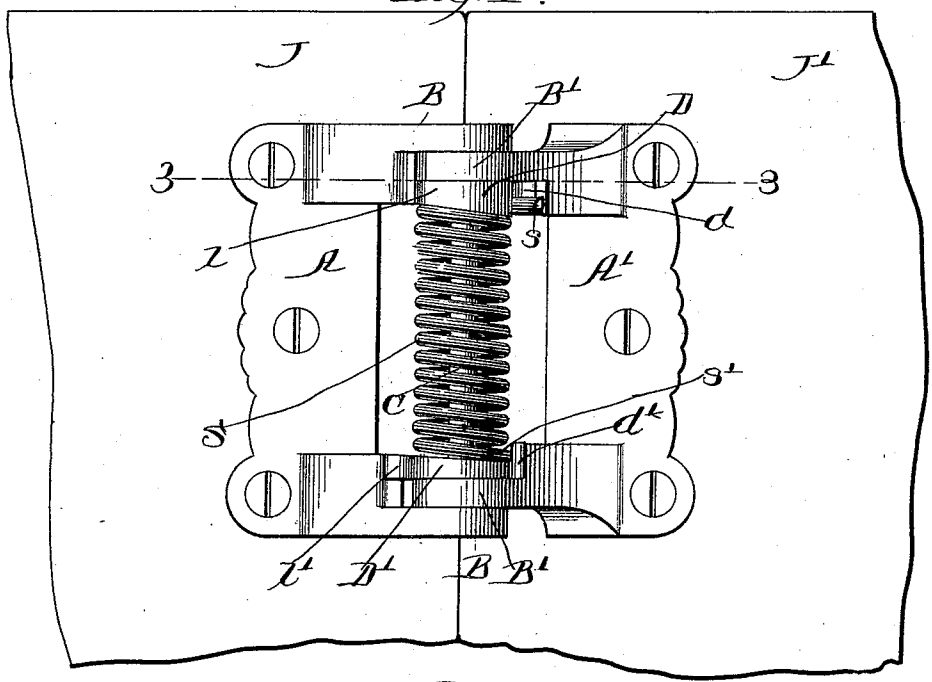


Fig. 2.

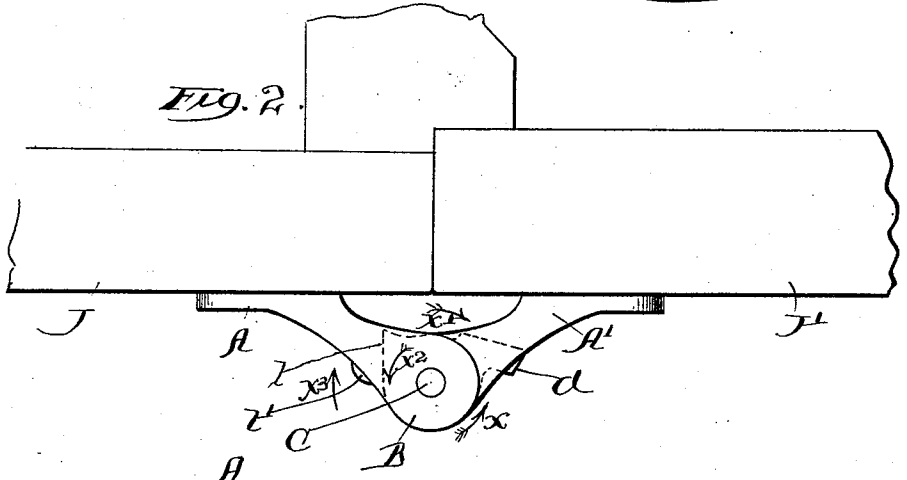
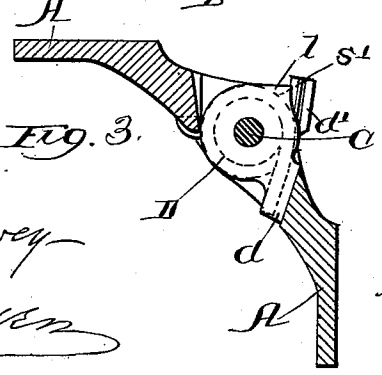


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4

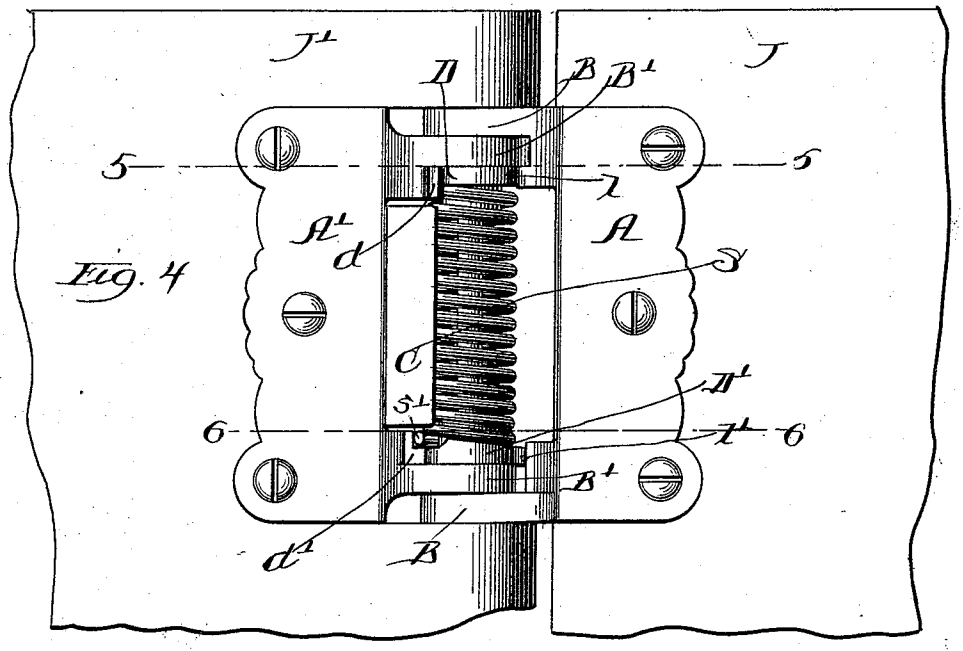


Fig. 5.

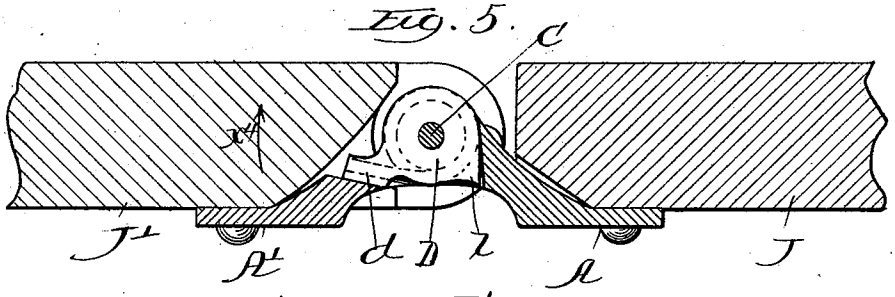


Fig. 6.

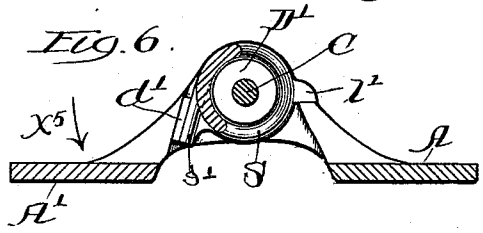
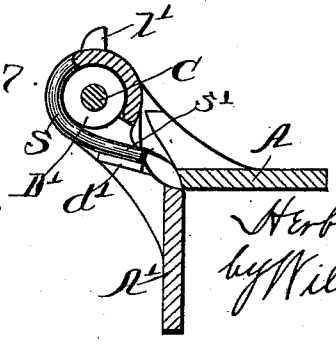


Fig. 7.



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UNITED STATES PATENT OFFICE.

HERBERT A. RIPPIEN, OF FREEPORT, ILLINOIS, ASSIGNOR OF ONE-HALF TO DAVID H. BOKHOF, OF SAME PLACE.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 527,158, dated October 9, 1894.

Application filed April 11, 1893. Serial No. 469,875. (No model.)

To all whom it may concern:

Be it known that I, HERBERT A. RIPPIEN, a citizen of the United States of America, residing at Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Spring-Hinges, of which the following is a specification.

My invention relates to improvements in spring hinges, its object being to provide a reversible hinge adapted to be used either as a mortise or a surface hinge, and when used as a mortise hinge to permit the swinging in either direction of the door to which it is attached.

The invention is fully described and explained in this specification and shown in the accompanying drawings, in which—

Figure 1 is a front elevation of a hinge embodying my invention applied as a surface hinge. Fig. 2 is a top plan of the hinge, the door, and the jamb and casing thereof. Fig. 3 is a transverse horizontal section through the line 3—3, Fig. 1. Fig. 4 is a front elevation of the hinge reversed and applied as a mortise hinge. Fig. 5 is a transverse horizontal section through the line 5—5, Fig. 4. Fig. 6 is a similar section through the line 6—6, Fig. 4, the leaves being in their normal position and in the same plane; and Fig. 7 is a view similar to Fig. 6, but with one of the leaves swung ninety degrees toward the other from the position illustrated in Fig. 6. In all the horizontal sections the view is downward.

In Figs. 1, 2, and 3, A, A′ are two leaves of suitable form provided with terminal ears, B, B, B′, B′, joined by a pintle, C, and forming knuckle joints at the ends of the hinge. The bases of the two leaves are in the same plane and are adapted to be applied to the surface of the casing, J, and door, J′, by means of screws preferably cone-headed and set in countersinks in the leaves. Between the ears, B′, B′, is a coiled spring, S, of usual form encircling the pintle and having its ends in engagement with and supported by plates, D, D′. The ends, *s*, *s*′, of the spring are preferably straight and lie in grooves in arms, *d*, *d*′, formed on the margins of the plates, D, D′, respectively. The arms, *d*, *d*′, are so constructed and arranged with reference to the leaf, A′, as to press against it in opposite directions, the force of the end, *s*, of the spring being exerted to swing the leaf, A′, in the direction indicated by the arrow, *x*, Fig. 1, and the force of the end, *s*′, being exerted to force it in the direction indicated by the arrow, *x*′, in said figure. The two plates, D, D′, are also provided with lugs, *l*, *l*′, respectively, these lugs being so arranged as to press in opposite directions against the leaf, A, the lug, *l*, being pressed against said leaf in the direction indicated by the arrow, x^2, and the lug, *l*′, being pressed against it in the direction indicated by the arrow, x^3, Fig. 2. The force of the spring thus balances itself by pressing equally in opposite directions against each of the leaves, and the net result of these forces is a tendency to hold the leaves in a fixed position in which the spring is at its lowest tension.

When the hinge is in the position illustrated in Figs. 1 and 2, the door and the leaf, A′, may be swung in the direction indicated by the arrow, *x*′, Fig. 2, until the leaf, A′, has passed through an angle of substantially one hundred and eighty degrees, the position of the various parts when the leaf, A′, has swung through an angle of ninety degrees being shown in Fig. 3. It will be seen that as the leaf, A′, swings away from its normal position toward that shown in Fig. 3, it carries with it the arm, *d*, thus rotating the plate, D, about the pintle, C, and withdrawing the lug or shoulder, *l*, from the surface of the leaf, A, against which it rests when in its normal position. At the same time, the leaf, A′, swings away from the arm, *d*′, on the plate, D′, that plate being held stationary by the lug, *l*′, which resists the tendency of the spring to rotate it about the pintle. When the door after being swung away from its normal position, is released, the force of the spring carries it back at once and tends to hold it in its normal position until force sufficient to overcome the resistance of the spring is again applied to it.

The parts of the hinge shown in Figs. 4, 5, 6, and 7, are the same as those already described, but as shown in these figures, the hinge is reversed, the plates being screwed to the surface of the casing, J, and door, J′, but in a

position opposite to that shown in Figs. 1 and 2. When thus applied, the spring instead of being projected from the surface of the door and casing, lies in a suitable recess within the edge of the door, the pintle line of the hinge being preferably in a plane midway between the two faces of the door. The leaves are fastened to the door and casing by means of screws which may be either set in countersinks, the screw-holes being countersunk from both sides for that purpose, or may be round-headed screws, such as are illustrated in the drawings. When the hinge is thus applied, the margin of the door next the jamb or casing must be rounded, or the edge of the casing must be made concave, in order that the door may swing freely in either direction and the hinge then operates as what is known as a double-swing hinge permitting the door to swing in either direction, but tending to return it from either direction to its normal position in the plane of the casing.

Referring to the figures, it is evident that the leaf, A′, may swing in the direction indicated by the arrow x^4, in Fig. 5, and that this operation will be precisely the same as the one illustrated in Fig. 3, and already described. It is also evident that the leaf, A′, may swing in the direction indicated by the arrow, x^5, Fig. 6, and that in so doing it must carry with it the arm, d', of the plate, D′, and thus rotate the plate and swing the lug, l', away from the leaf, A, as illustrated in Fig. 7. At the same time this movement of the leaf, A′, must carry it away from the arm, d, of the plate, D, that plate being held stationary by means of the lug, l, which is pressed against the leaf, A, in the manner clearly shown in Fig. 5. The hinge thus permits the swinging of the leaf, A′, and the door in either direction from its normal position and the spring tends to bring the door back to its normal position when it has been swung away from it in either direction.

Having now described and explained my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the reversible leaves, A, A′, provided with ears pivoted together to form knuckle joints, of the spring lying between the ears and the plates engaging the ends of the spring and adapted to press in opposite directions against each of the leaves, the pintle line of the hinge being out of the plane of the two leaves and the leaves being reversible and adapted to present either of their opposite faces to the surface of a door and its casing, whereby the spring may lie within the edge of a door or be projected from the face thereof.

2. The combination with the leaves, A, A′, having ears, B, B, B′, B′, pivoted together to form knuckle joints, of the spring, S, and the plates, D, D′, engaging the ends of the spring and formed with arms, d, d, and lugs, l, l', respectively, the two arms being adapted to press in opposite directions against one leaf and the two lugs in opposite directions against the other leaf, and the leaves being reversible whereby the spring may lie either within or without the edge of the door; substantially as shown and described.

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