

(Model.)

L. M. DEVORE & F. W. HOEFER.

SPRING HINGE.

No. 389,450.

Patented Sept. 11, 1888.

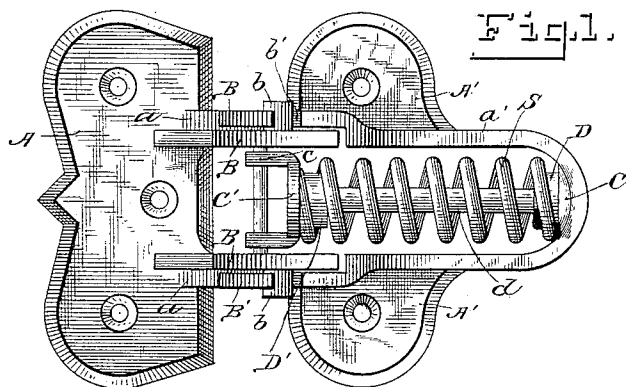


Fig. 2.

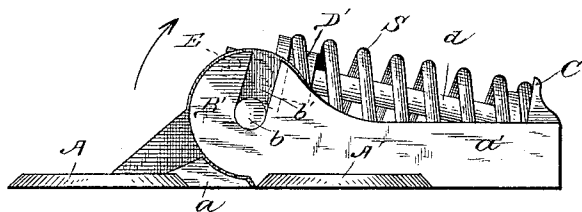


Fig. 3.

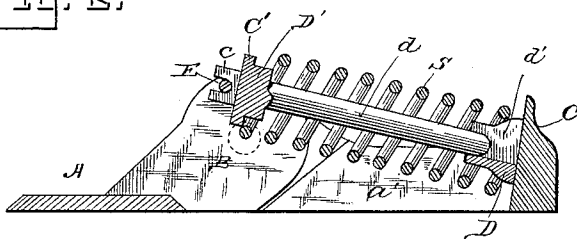
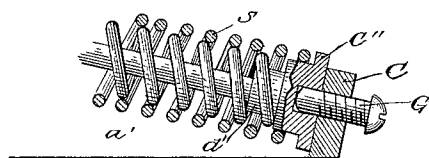


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

LEVI M. DEVORE AND FREDERICK W. HOEFER, OF FREEPORT, ILLINOIS;
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SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 389,450, dated September 11, 1888.

Application filed January 28, 1888. Serial No. 262,235. (Model.)

To all whom it may concern:

Be it known that we, LEVI M. DEVORE, a resident of Freeport, in the county of Stephenson and State of Illinois, and FREDERICK W. HOEFER, also a resident of Freeport, in the county of Stephenson and State of Illinois, 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.

Our invention relates to improvements in spring-hinges of that class in which the operation of the spring upon the hinge-leaves is reversed when the leaves reach a certain relative position, either in opening or closing.

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

Figure 1 is a plan of a hinge embodying our improvements. Fig. 2 is a side elevation thereof. Fig. 3 is a longitudinal central vertical section of the same, and Fig. 4 is a similar section of a slightly-modified form of our invention.

In the views, A A' are the leaves of a surface-butt, the leaf A being provided with two ears, B, and the leaf A' with two corresponding ears, B', embracing the ears B. The ears B' are formed with oblique radial slots b', and the ears B are provided with outwardly-projecting short pintles or gudgeons b, which lie at the inner ends of the slots b' and at the centers of the ears B'. The pintles b connect the ears B B', and form two knuckles, separated by a sufficient space for the reception of a spring. Upon the leaf A' are formed two parallel walls or webs, a', lying, respectively, in the planes of the ears B, the two webs being joined at their outer ends by a transverse plate, C, preferably rising above the edges of the webs. On the inner face of the plate C is formed integrally a hub, D, the hub D and plate C being adapted to receive and form a seat for one end of a compressible coiled spring, S. The opposite end of the spring rests upon a second plate, C', and hub D', the plate being provided with ears c, whose ends are either notched or formed with

holes bearing upon a transverse rod, E. The rod E is eccentric with reference to the ears B, to which it is fastened, and is preferably farther than the pintle-axis from the plane of the leaves and from the plate C. The distance between the plates C C' is somewhat less than the normal length of the spring S, so that the spring, when in working position, is compressed and tends to force the two plates apart and thus to press the pin E away from the plate C. Buckling or bending of the spring is prevented by forming on the plate C' a rod, d, which enters a groove or hole, d', in the boss or hub D of the plate C. This opening in the hub permits longitudinal play of the rod d, and at the same time keeps the free end thereof in the axial line of the spring.

It is evident that when the parts of the hinge are in the relative positions indicated in the first three figures of the drawings if the leaf A' be held stationary and the leaf A be rotated in the direction indicated by the arrow in Fig. 2 the motion of the pin E about the pintle-line of the hinge must continually compress the spring until the pin reaches a point in the line joining the pintles and the center of the boss D, and that the further motion of the pin in the same direction will permit the expansion of the spring. The necessary result of this is that during the earlier part of the movement of the leaf A in the direction indicated by the arrow the spring tends to force the leaf back to its illustrated position—or, in other words, to close the hinge—and that in the latter part of its movement the spring tends to assist the motion of the leaf in the direction indicated by the arrow, or, in other words, to throw the hinge open.

In certain positions of the leaves the pintles or gudgeons b tend to leave the centers of the ears B' by sliding along the slots b'. This movement is prevented by forming on the ears B lugs a, lying in the planes of the ears B', respectively, and having faces whose curve corresponds to the circles of the ears B', as illustrated in Fig. 2.

Fig. 4 shows a hinge in which the force of the spring S is supplemented by that of a second spring, S', lying within the other, and having its ends seated on secondary hubs formed

on the faces of the hubs D D'. The hub D is formed on a plate, C', independent of the plate C, which connects the webs a', and a set-screw, G, passes through the plate C and serves to regulate the position of the plate C'. The inner end of the set-screw is preferably seated in a socket in the plate C' and hub D for the purpose of holding these parts in line.

It is evident that the leaves of the hinge may both have the form of the leaf A', and may both be provided with transverse pins corresponding to the pin E, and also with springs bearing against said pins. The only object of the construction suggested is the doubling of the closing force of the hinge, and as this force can be made sufficient with a single spring, or with one spring lying within another, we prefer the forms illustrated in the drawings.

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

1. In a spring-hinge, the combination, with two leaves of suitable form and a pintle or pintles connecting them, of a longitudinally-compressible spring-coil pressing at one end against a stationary bearing upon one of the leaves and at the other end against a pivot fastened to the other leaf and eccentric with reference to the pintle-line of the hinge, whereby the hinge may be held either open or closed, as set forth.

2. The combination of the leaves A A', connected by suitable pintles, the transverse pin E, fastened to the leaf A and eccentric with reference to the pintle line of the hinge, the plate C', bearing against the pin E, and the spring S, pressing at one end against the plate

C' and at the other end against a stationary seat on the leaf A', substantially as and for the purpose set forth.

3. The combination of the leaf A', having the ears B', formed with slots b', the leaf A, having ears B, provided with gudgeons b, lying in the slots b', and with lugs a, preventing accidental escape of the gudgeons from the slots, and the spring S, pressing at one end against a bearing on the leaf A' and at the other end against a pivot on the leaf A, eccentric with reference to the hinge-pintle, substantially as and for the purpose set forth.

4. The combination of the leaves A A', provided with ears connected by suitable pintles, the pin E, fastened to the leaf A and eccentric with reference to the hinge-pintle, the plate C', having ears C, bearing upon the pin E, and provided with the hub D' and rod d, the slotted boss D, formed on the leaf A' and receiving the free end of the pin d, and the spring S, having ends encircling the bosses D D', substantially as and for the purpose set forth.

5. The combination of the leaves A A', connected by suitable pintles, the eccentric transverse pin E, set in the leaf A, and the two springs S S', one within the other, and both pressing at one end against the pin E and at the other end against a bearing on the leaf A', substantially as and for the purpose set forth.

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

LEVI M. DEVORE.

FREDERICK W. HOFER.

Witnesses:

MICHAEL STOSKOPF,
LEONARD STOSKOPF.