(No Model.) 2 Sheets—Sheet 1.

L. M. DEVORE.

SPRING HINGE.

No. 475,080. Patented May 17, 1892.

Fig. 1.

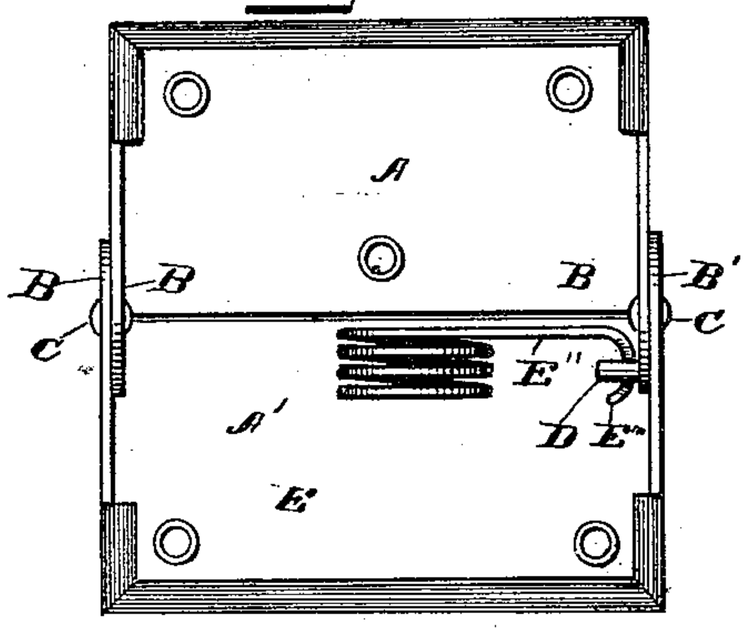


Fig. 2.

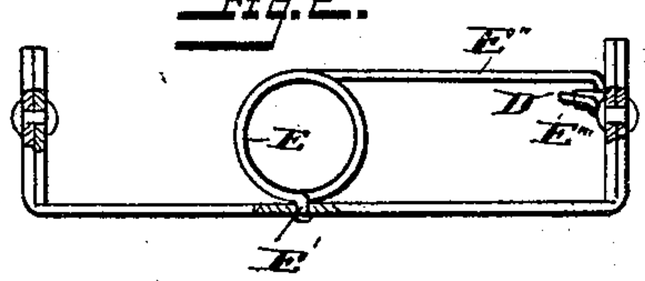


Fig. 3.

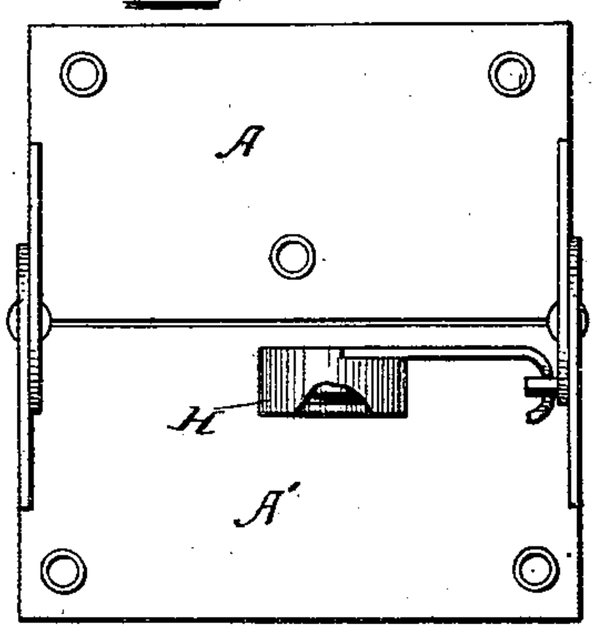


Fig. 4.

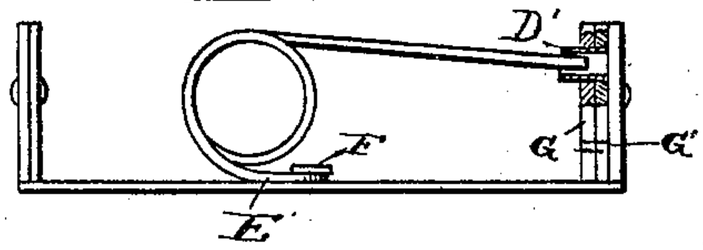


Fig. 5.

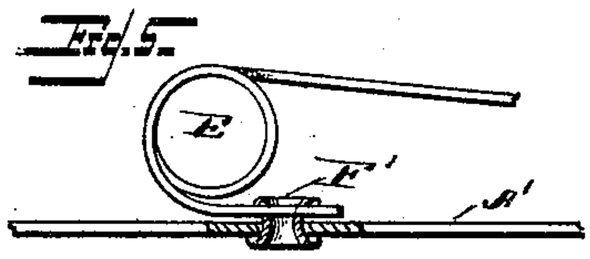


Fig. 3ª.

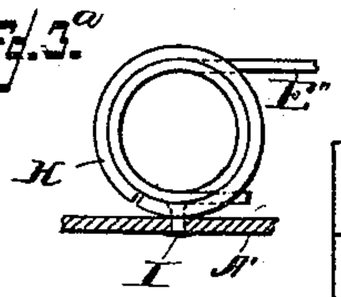
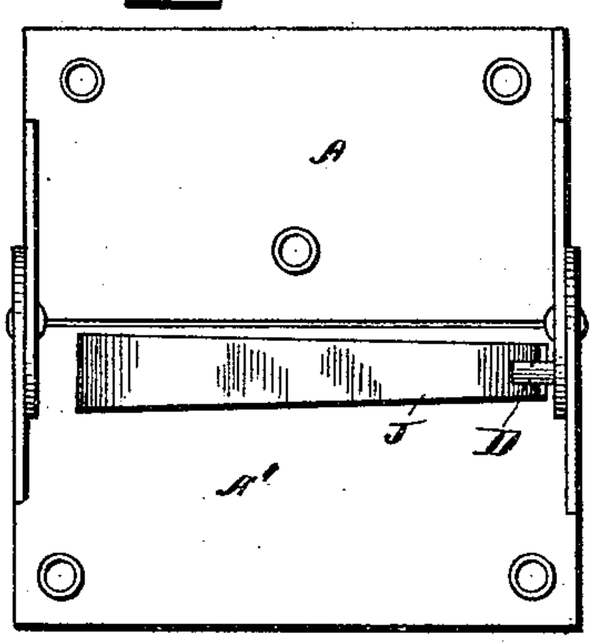


Fig. 6.



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(No Model.) 2 Sheets—Sheet 2.

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SPRING HINGE.

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Fig. 7.

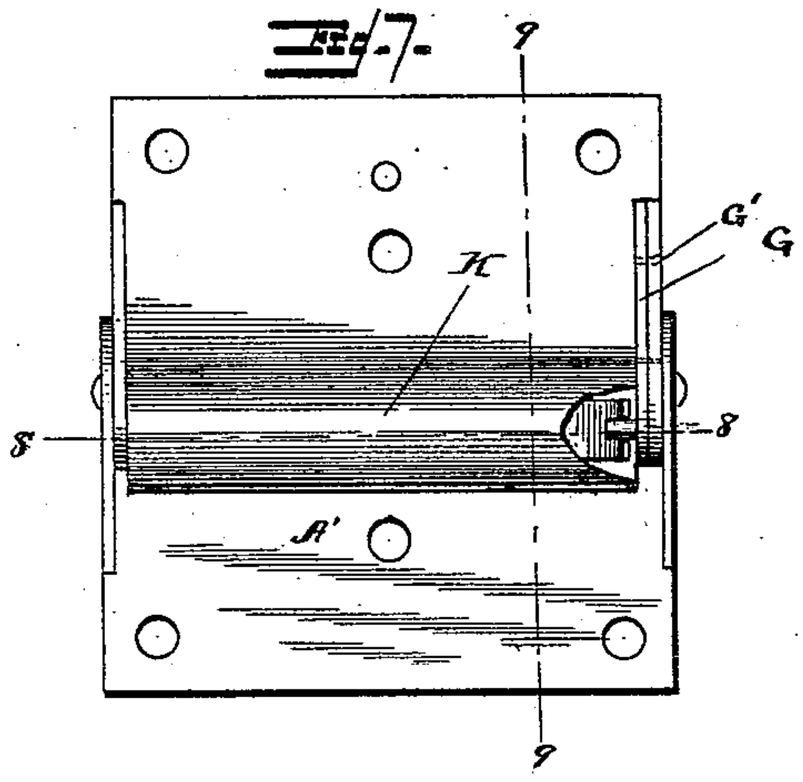


Fig. 8.

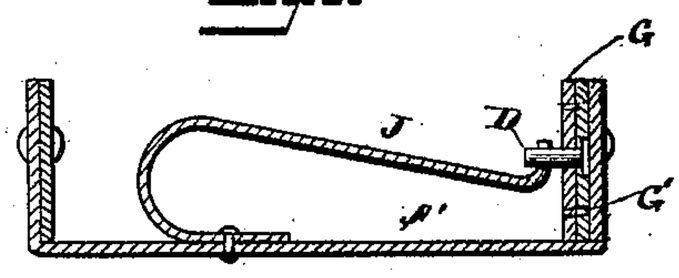


Fig. 9.

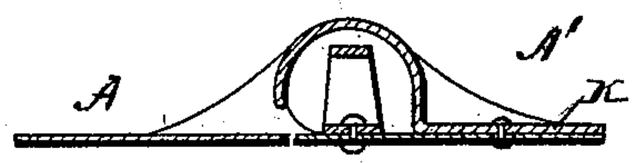


Fig. 10.

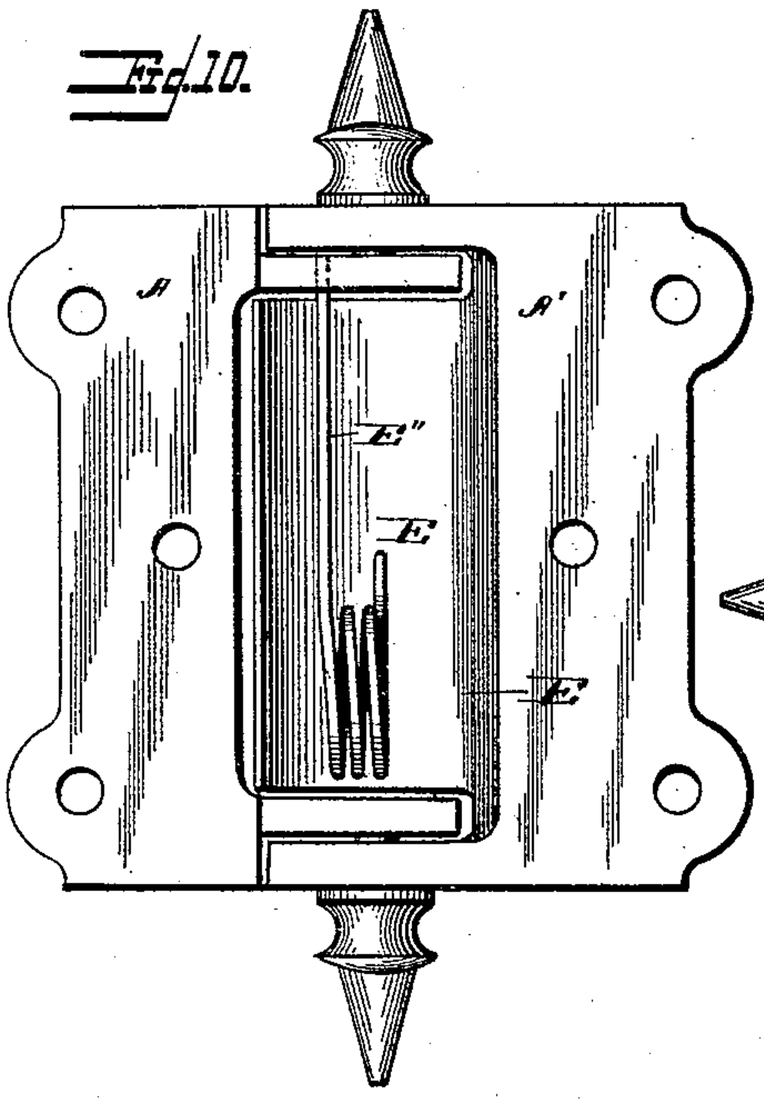
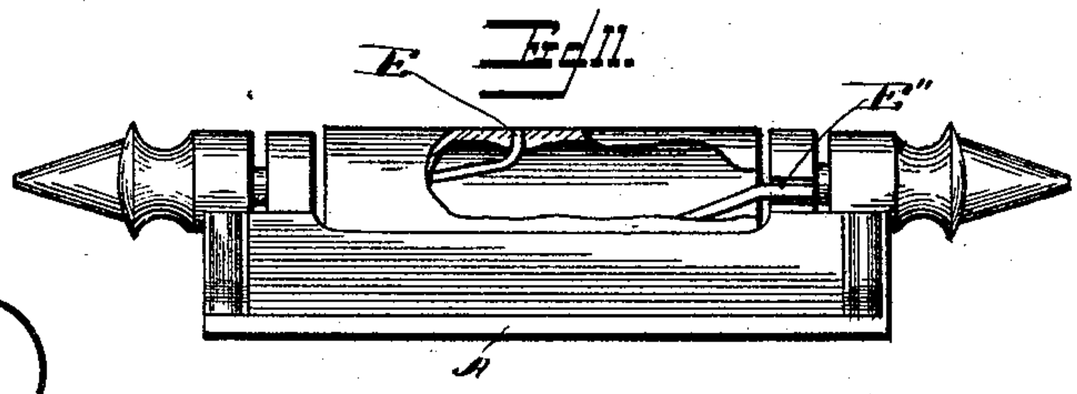


Fig. 11.



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UNITED STATES PATENT OFFICE.

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SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 475,080, dated May 17, 1892.

Application filed February 12, 1892. Serial No. 421,288. (No model.)

To all whom it may concern:

Be it known that I, LEVI M. DEVORE, a citizen of the United States, residing at Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Spring-Hinges; and I 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 appertains to make and use the same.

This hinge throws the door either shut or open, according as the door is or is not opened beyond a certain point, and it is especially adapted to be formed from sheet metal. When so made, it consists in its simplest form of two leaves stamped ready for use at one operation, three rivets, and a spring. These leaves may be corrugated, so as to have the appearance of cast leaves, except as to the acorns or tips, and even these may be added as heads to certain pintle-rivets. The construction of the hinge is such that the spring undergoes only a trifling torsion or change of form, and therefore it may be made very strong and may have but few coils or even but a fraction of one coil or turn. It follows that the cost of the hinge is but a small part of the cost of the usual cast hinge having a coil that undergoes ninety degrees of torsion and that necessarily, therefore, has many turns or spirals.

In the drawings, Figure 1 is a plan of the hinge, having its spring unconcealed. Fig. 2 is a side view of the same, small portions being broken away. Figs. 3 and 3ª are similar views showing the addition of a coil-concealing hood. Figs. 4 and 5 are views like Fig. 2, showing slight modifications. Figs. 6, 7, 8, and 9 show a flat **C**-spring in place of the coil, both with and without a concealing-hood. Figs. 10 and 11 show a cast form.

In Figs. 1 and 2, A A′ are two hinge-leaves, preferably formed by stamping from sheet metal, with all the screw and rivet holes, the ears B B′ being bent up by the die after the leaves are otherwise complete. These two leaves are then united by common rivets C C, which form the pintles of the hinge. A third rivet D is fixed as a stud in one of the ears of the leaf A a little above and at one side of the pintle-line. A spring-coil E, having its axis transverse to the pintle-line, is pivoted to the leaf A′ at some distance from the stud by means of passing its short arm E′ through the leaf. The other and longer arm E″ extends alongside the stud D and has its end bent, forming a lateral **U**-shaped hook E‴ to receive the stud. Now if the leaf A be secured to the door and the leaf A′ to the jamb, it is plain that opening the door will carry the stud around the pintle-line, first pushing the spring-arm toward the plane of the leaf A′ and then allowing it to again recede therefrom, the coil rotating bodily upon its pivot or short arm, and the hook E‴, sliding slightly outward upon the stud. Evidently when the stud is exactly beneath the pintle-line the hinge is at a "dead-point," and as soon as that point is passed the spring tends to throw the door open. If the stud were normally at the pintle's distance from the leaf A′, the dead-point would correspond to ninety degrees angular swing of the door from its closed position; but this point may be varied by varying the position of the stud. It is also evident that if the stud have the location just mentioned the end of the spring-arm is depressed exactly the distance from the stud to the pintle and that this imparts, in any case, but a very few degrees of torsion to the coil, though the amount varies with the diameter of the coil and its distance from the stud. The short arm E′ of the coil may be hooked about a stud F upon the leaf, as suggested in Fig. 4, or may, without bending, be be thrust through a rivet F′, Fig. 5, and the stud D′ may be a tubular rivet, Fig. 4, into which the long arm passes without bending. The stud-bearing ear may be reinforced by a plate G, Figs. 4, 7, and 8, secured to it by rivets G′, and if the plate be thick the tubular rivet D′ may be omitted, the arm entering the plate directly, or a perforated protuberance may be struck up from said ear. The coil may be concealed by a hood H, Figs. 3 and 3ª, preferably a sheet of metal bent to form an open-ended cylinder and secured to the leaf by a pivotal rivet I. In this case the short arm of the spring engages the hood or the hood-securing rivet. Since the bending of the coil is so slight, it may be replaced by a flat **C**-spring J, Figs. 6, 7, 8, and 9, having one arm pivotally fixed to the plate and the

other bent and notched or perforated at its end to engage the stud. Either form of spring may be concealed by a sheet-metal hood K, Figs. 7 and 9, riveted to one of the leaves.

In Figs. 10 and 11 a cast form is shown, Fig. 10 being a bottom plan and Fig. 11 a side view, with part of the hood broken away to show the disposition of the spring-arms. In this case the hood is integral with the hinge-leaf, open below and symmetrical with reference to the pintle-line, so that the hinge has precisely the appearance of hinges having the coil's axis coincident or nearly coincident with the pintle-line. In this case the short arm of the spring is pivoted to the upper or outer side of the hood by one of the devices shown or other suitable construction. This construction as to hood and pivoting is equally adapted to sheet-metal construction.

Indeed, while sheet metal is preferred as lighter, cheaper, and stronger, cast-metal leaves, with or without the usual integral pintles, may be used in the other forms and many other changes may be made by any mechanic while still using substantially my pivoted spring.

What I claim is—

1. The combination, with the leaves hinged at their ears, of a spring pivoted at one end to one of the leaves and adapted to bear at its opposite end upon the ear of the opposite leaf, said spring being adapted to turn upon its pivot transversely to the pintle-line, substantially as shown and described.

2. The combination, with a hinge-leaf and a spring pivotally mounted thereon to rotate about an axis approximately perpendicular to the plane of the leaf, of a hood concealing said spring and rotating therewith about the pivotal axis.

3. The combination, with two suitably-pivoted hinge-leaves, of a spring-concealing hood pivotally secured upon one of said leaves and rotating about an axis approximately perpendicular to the plane of the leaf, and a spring mounted in said hood and having an arm engaging the opposite leaf at one side of the pintle-line, substantially as set forth.

4. The combination, with two suitably-connected hinge-leaves, of a spring-coil pivotally mounted transversely to the pintle-line upon one of said leaves and having an arm approximately parallel to the pintle-line engaging an ear of the opposite leaf at one side of that line.

In testimony whereof I affix my signature in presence of two witnesses.

LEVI M. DEVORE.

Witnesses:
MICHAEL STOSKOPF,
LEONARD STOSKOPF.