

(Model.)

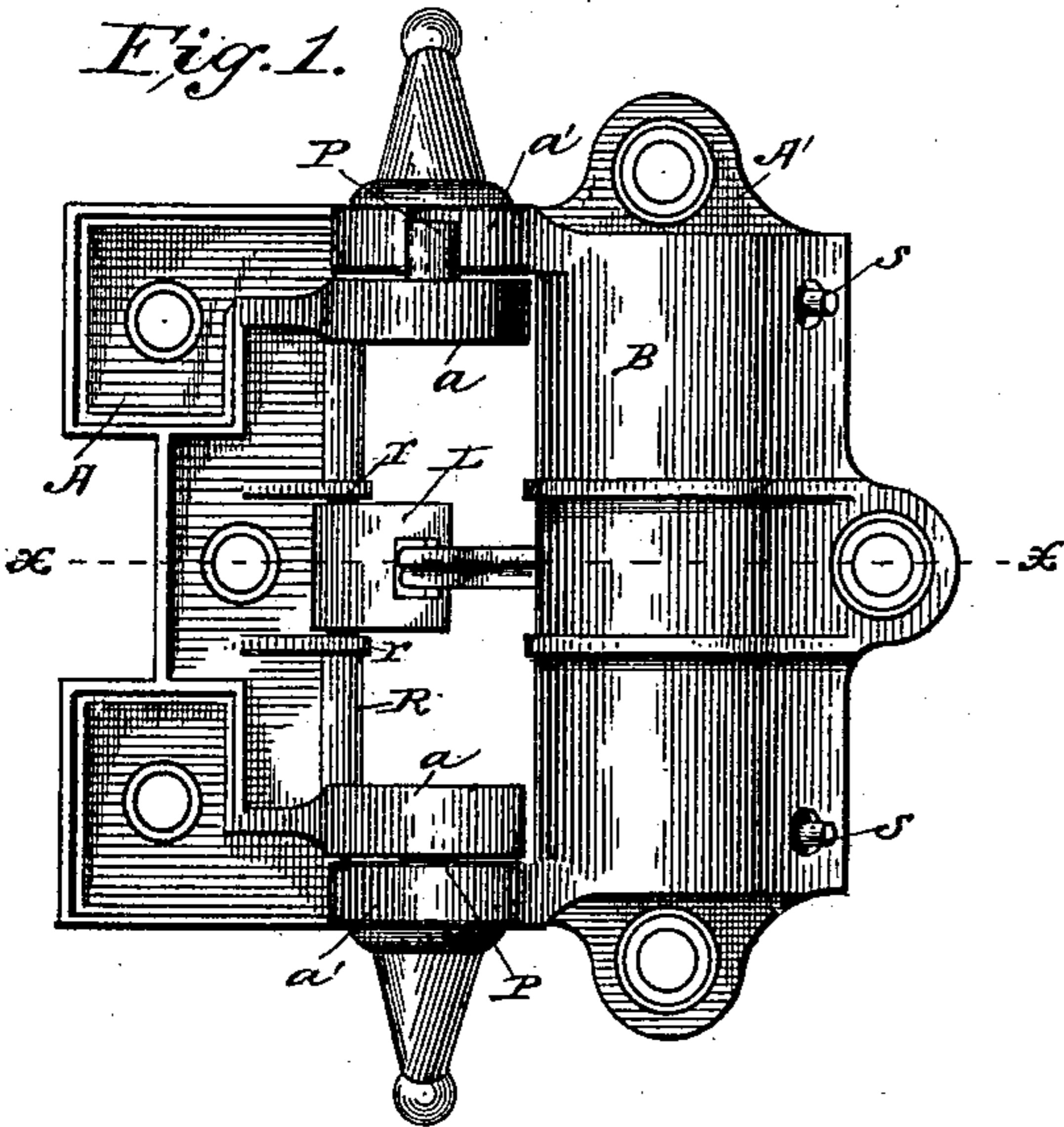
L. M. DEVORE & F. W. HOEFER.

SPRING HINGE.

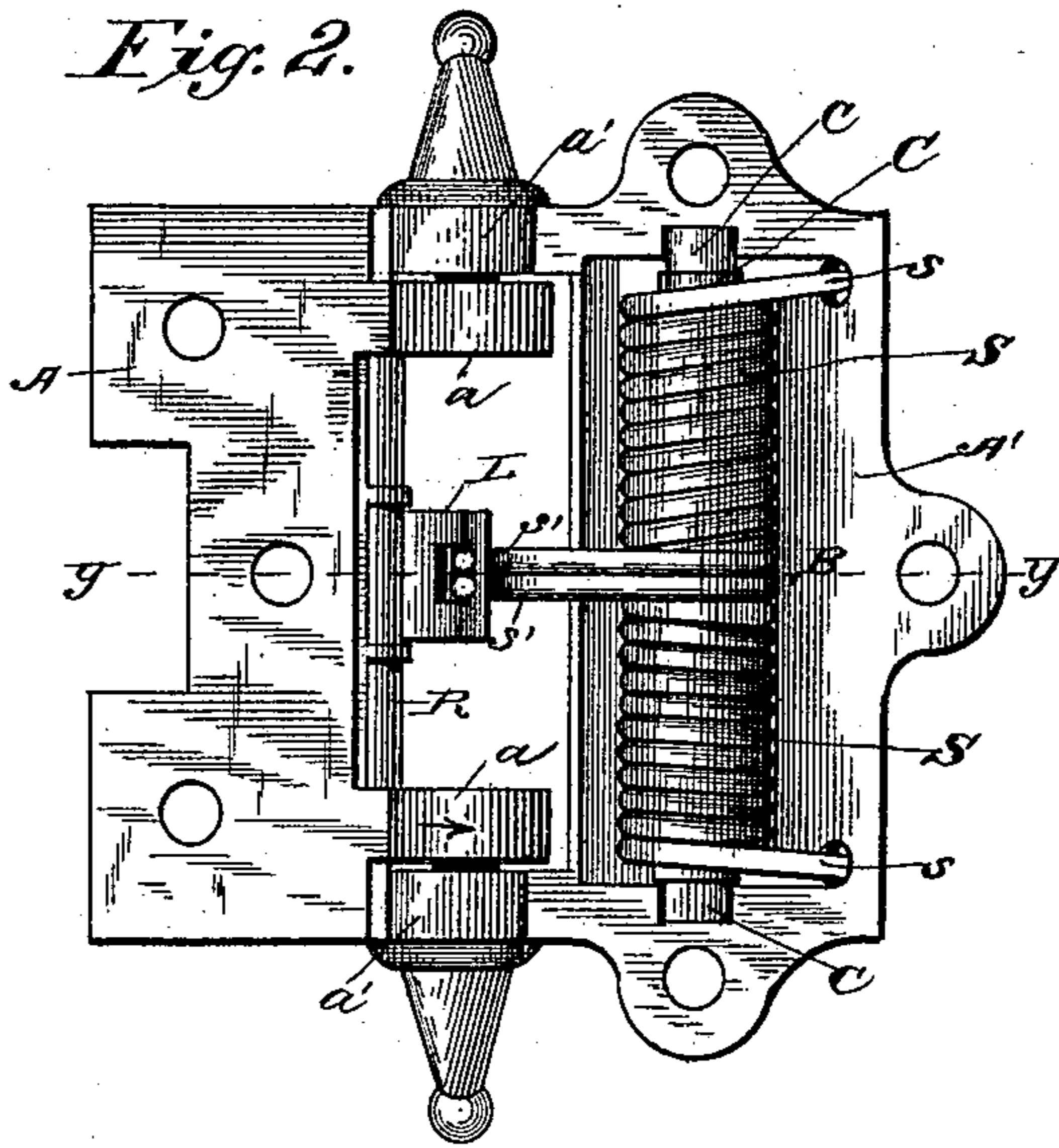
No. 396,031.

Patented Jan. 8, 1889.

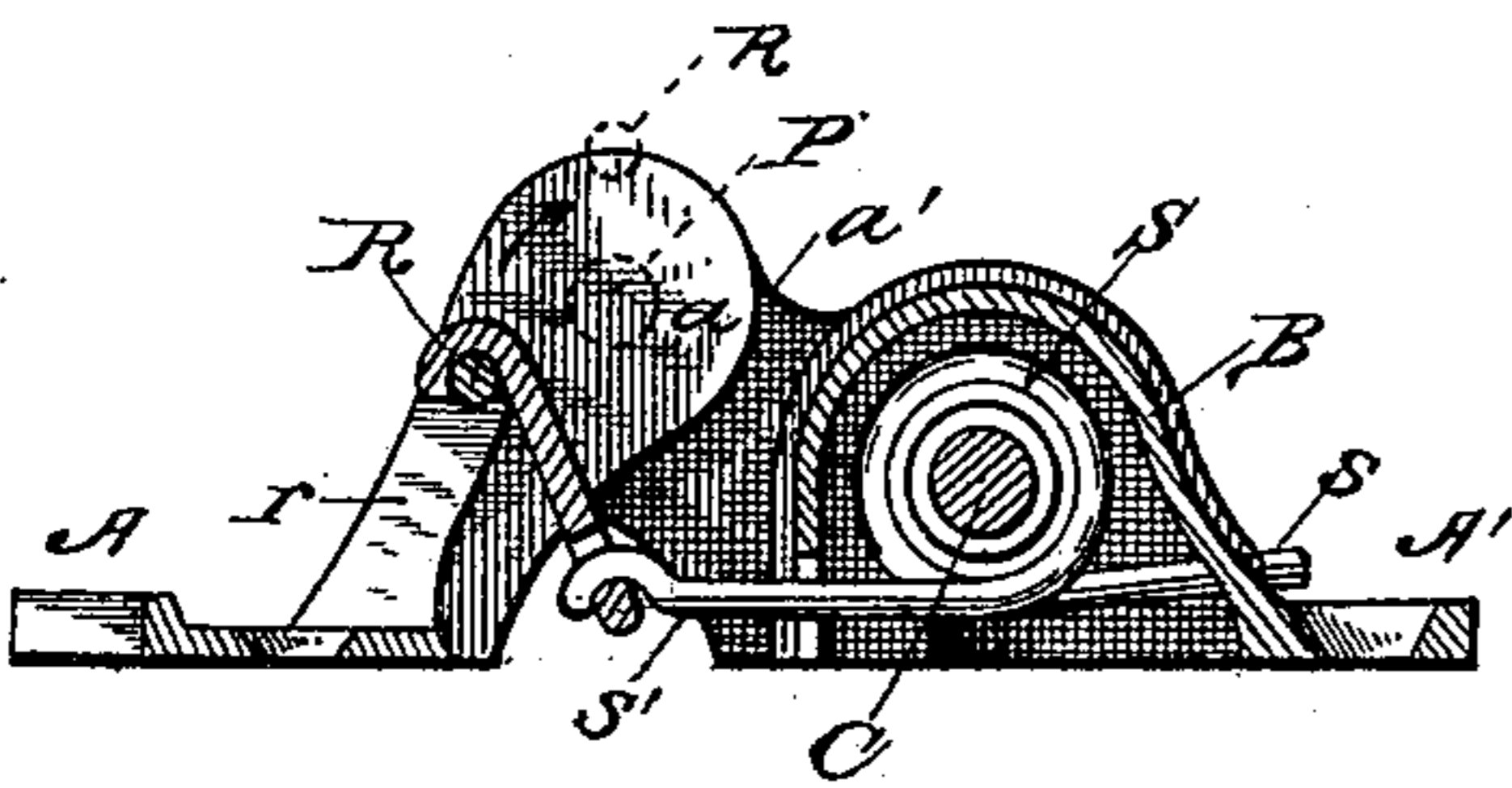
*Fig. 1.*



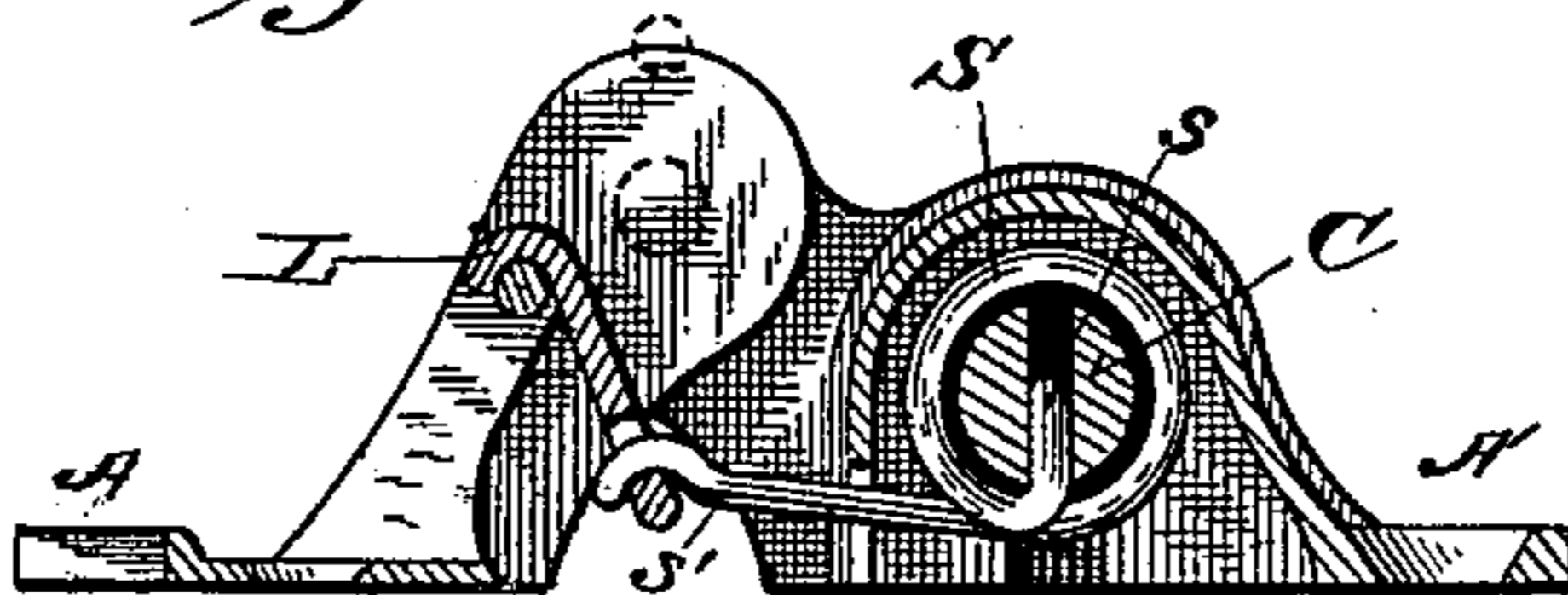
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



Witnesses.

*Harry S. Rohrer.*  
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Inventor.

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# UNITED STATES PATENT OFFICE.

LEVI M. DEVORE AND FRED. W. HOEFER, OF FREEPORT, ILLINOIS, ASSIGNORS,  
BY DIRECT AND MESNE ASSIGNMENTS, TO THE STOVER MANUFACTUR-  
ING COMPANY, OF SAME PLACE.

## SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 396,031, dated January 8, 1889.

Application filed February 27, 1888. Serial No. 265,460. (Model.)

*To all whom it may concern:*

Be it known that we, LEVI M. DEVORE, a resi-  
dent of Freeport, in the county of Stephenson  
and State of Illinois, and FRED. W. HOEFER,  
5 also a resident of Freeport, in the county of  
Stephenson and State of Illinois, have in-  
vented certain new and useful Improvements  
in Spring-Hinges; and we do hereby declare  
the following to be a full, clear, and exact  
10 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, and is fully described and ex-  
15 plained 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 bottom plan of the  
same. Fig. 3 is a section through the lines  $x$   
20  $x$ , Fig. 1, and  $y y$ , Fig. 2. Fig. 4 is a section of  
a modified form, the position of the plane of  
section being the same as that of the plane  
of section in Fig. 3.

In Figs. 1, 2, and 3,  $A A'$  are two hinge-leaves  
25 formed, respectively, with ears  $a a a' a'$ , con-  
nected by short pintles  $p p$  in a manner com-  
mon in hinges of this class. The leaf  $A$  is  
provided with a rod,  $R$ , parallel to the axis  
of the hinge, but at one side thereof, the rod  
30 being supported at its ends by the ears  $a a$   
of the leaf and at its center by braces  $r r$ ,  
formed integrally with the rod and the leaf.  
The leaf  $A'$  is preferably formed with a hood  
or shell,  $B$ , adapted to inclose and conceal a  
35 spring, and within this shell is an arbor,  $C$ ,  
parallel with the axis of the hinge and hav-  
ing its ends seated in suitable bearings,  $c$ .  
Two coiled springs,  $S S$ , are coiled about the  
arbor in opposite directions—*i. e.*, one right  
40 hand and the other left hand—and the outer  
ends,  $s s$ , of the two coils are secured to the  
leaf in any suitable manner, as by passing  
through openings in the shell  $B$ .

The inner contiguous ends,  $s' s'$ , of the two  
45 coils are extended at right angles to the arbor  
 $C$  toward the rod  $R$ , their extremities being  
formed with hooks lying immediately under  
the axis of the hinge. The hooks engage the  
lower end of a link,  $L$ , whose upper end is

hooked over or otherwise pivotally connected 50  
to the rod  $R$  at its center. The arrangement  
of the spring, the link, and the rod is such  
that the force of the spring tends to draw the  
rod downward or toward the base of the hinge,  
and when the hinge is closed, as shown in the 55  
figures, this force is evidently exerted to hold  
it closed and resists any effort to move the  
leaf  $A$  in the direction indicated by the ar-  
row in Fig. 3. If, however, the leaf be ro-  
tated in the direction indicated by the arrow 60  
until the rod  $R$  reaches a position directly  
above the axis of the hinge, as shown in dot-  
ted lines in Fig. 3, the rod  $R$ , the axis of the  
hinge, and the hooks  $s'$  at the ends of the  
springs  $S$  are all in the same plane, and the 65  
hinge is at its dead-point, the force of the  
spring having no tendency to either open or  
close the hinge. If the rotation of the leaf  
be continued still farther in the same direc-  
tion, the rod  $R$  passes beyond the vertical 70  
plane of the axis of the hinge, and the force  
of the spring then tends to throw the hinge  
open. As shown, the hinge reaches its dead-  
point when opened about one hundred and  
twenty degrees from its closed position; but 75  
the position of the rod and the spring may be  
so varied as to bring the dead-point in any  
desired position.

Fig. 4 shows a hinge in which a flat spring,  
 $S$ , is wound about a suitable arbor, one of its 80  
ends being secured in a slot therein, while its  
other end,  $s'$ , is hooked to a link,  $L$ , corre-  
sponding in position and function to the link  
in Figs. 1, 2, and 3. The operation of this hinge  
is the same as that of the one illustrated in 85  
the first three figures.

It is evident that other modifications may  
be evolved by any skilled mechanic from  
those illustrated and described. These forms  
are shown, therefore, simply as illustrations 90  
of the principle of operation which is common  
to them all, and not with the intention of set-  
ting forth all the variations that have occurred  
to us or that may be suggested to others upon  
examination of the drawings herein. In all 95  
the forms shown the link lies upon one side  
of the axis of the hinge when the hinge is  
closed and on the opposite side of the axis

when the hinge is open, and evidently the reversal of the operation of the spring upon the leaves is due to the fact that the line of strain crosses the axis as the hinge is opened or closed.

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 of two suitably-connected leaves, one of which is provided with a pivotal rod or pin, a spring-coil mounted parallel to the hinge-axis upon the other of said leaves and having its free or working end upon the side of the coil next the door or jamb, and a link connecting said free end with said pivotal rod, substantially as set forth.

2. The combination, with the leaf A', of the leaf A, connected therewith by suitable pintles and having the rod R at one side of the axis of the leaves, the arbor C, mounted on the leaf A', the springs S S, coiled about the arbor C and having their outer ends, s s, secured to the leaf A' and their inner ends, s' s', extending toward the rod R, and the link L, connecting the ends s' s' and the rod

R and adapted to cross the axis of the hinge as it is opened or closed, and thereby to reverse the operation of the spring upon the leaves, substantially as and for the purpose set forth.

3. The combination of the leaves A A', one provided with the rod R at one side of the axis of the leaves and the other with the hood or shell B, the arbor C, lying within the shell B and having its ends secured in bearings c c in the leaf, the springs S S, coiled about the arbor and having their ends s s secured by passing through the shell and their ends s' s' extended toward the rod R, and the link L, connecting the ends s' s' with the rod, 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.  
FRED. W. HOEFER.

Witnesses:

J. A. CRAIN,  
JOS. B. SMITH.