

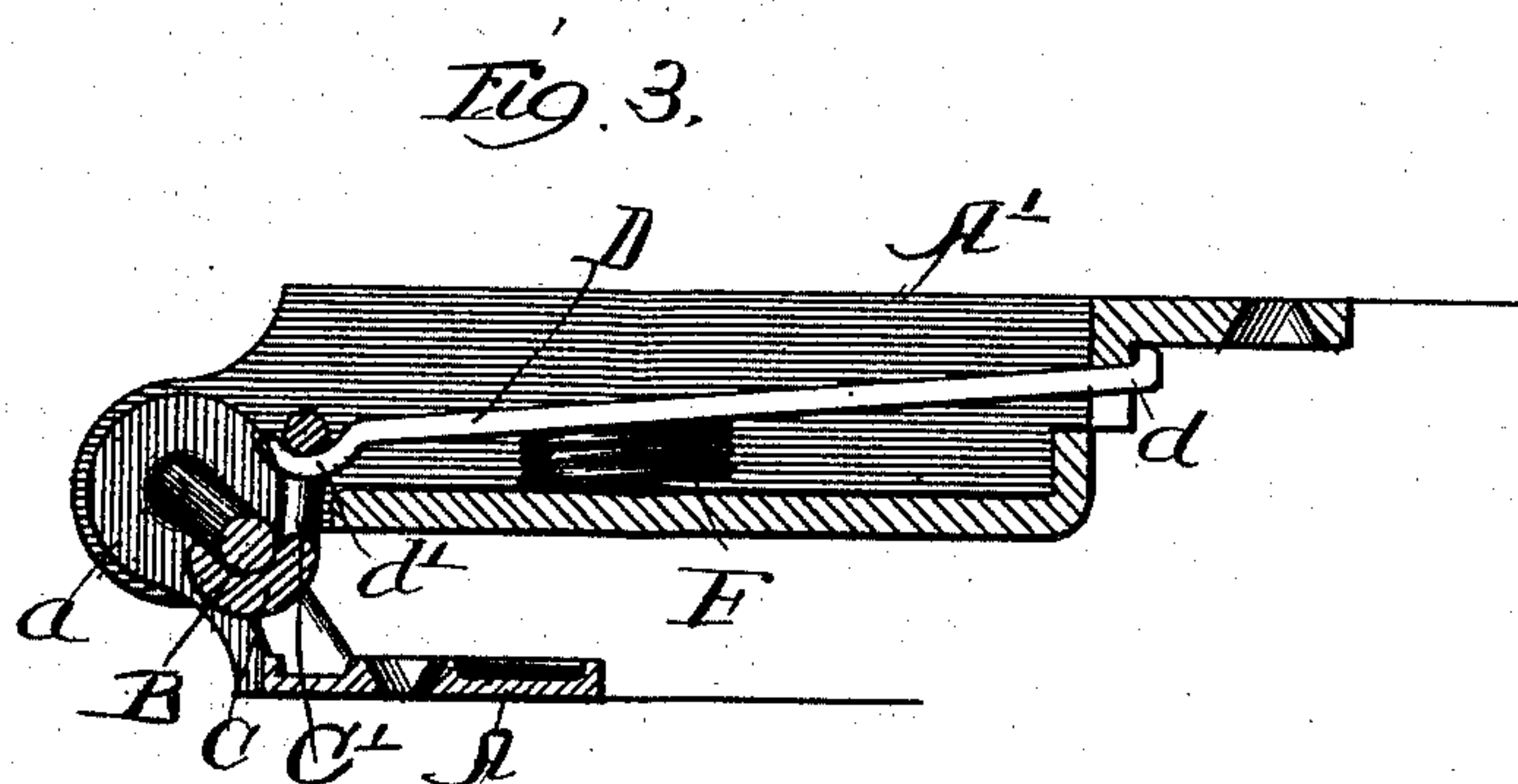
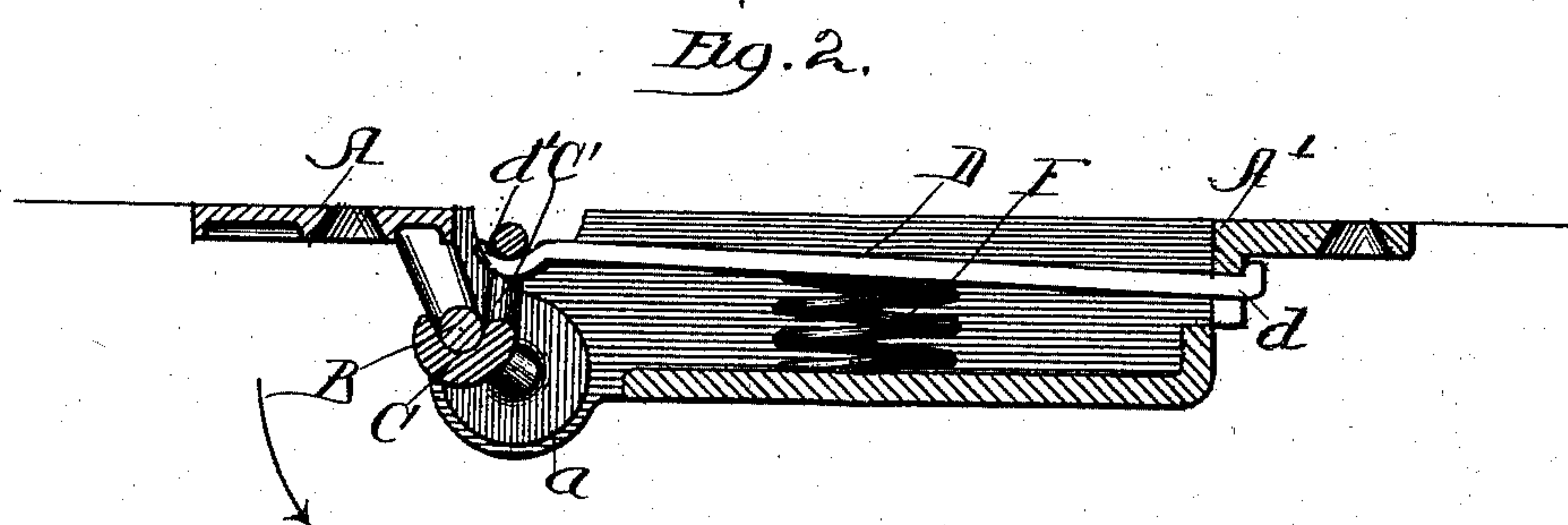
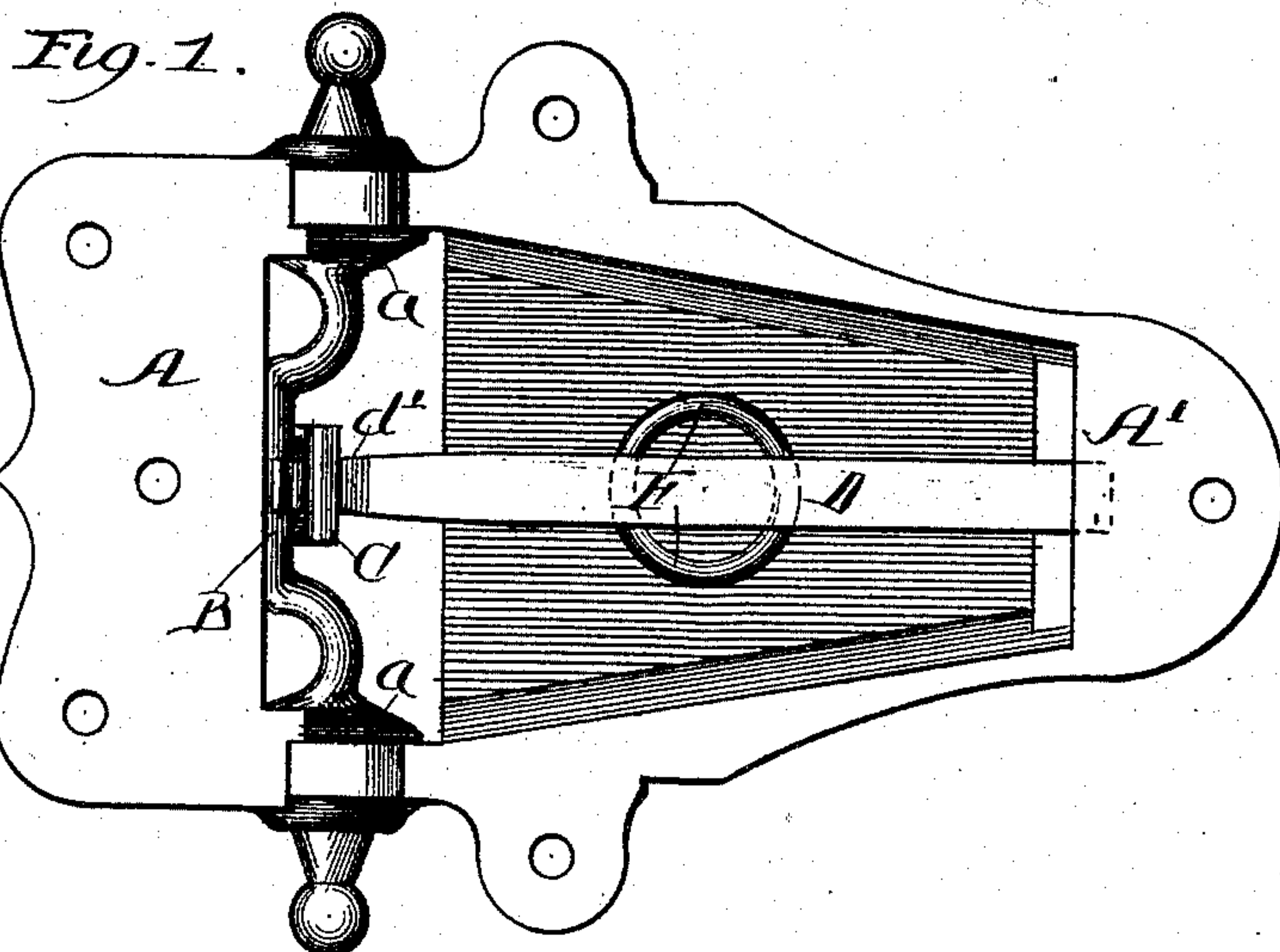
(No Model.)

J. W. COULTAS.
SPRING HINGE.

3 Sheets—Sheet 1.

No. 505,193.

Patented Sept. 19, 1893.



Witnesses:

Chas C. Harvey
A. J. H. Ebbesen

Inventors

Inventor:
James W. Coulter
by Wiles, Turner & Rich
attys

(No Model.)

3 Sheets—Sheet 2.

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Fig. 4.

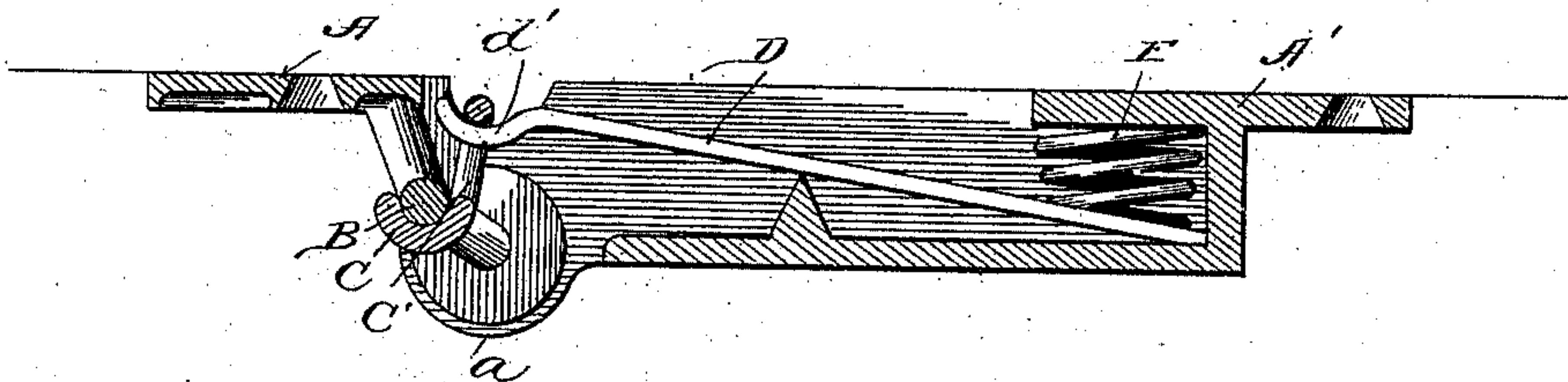
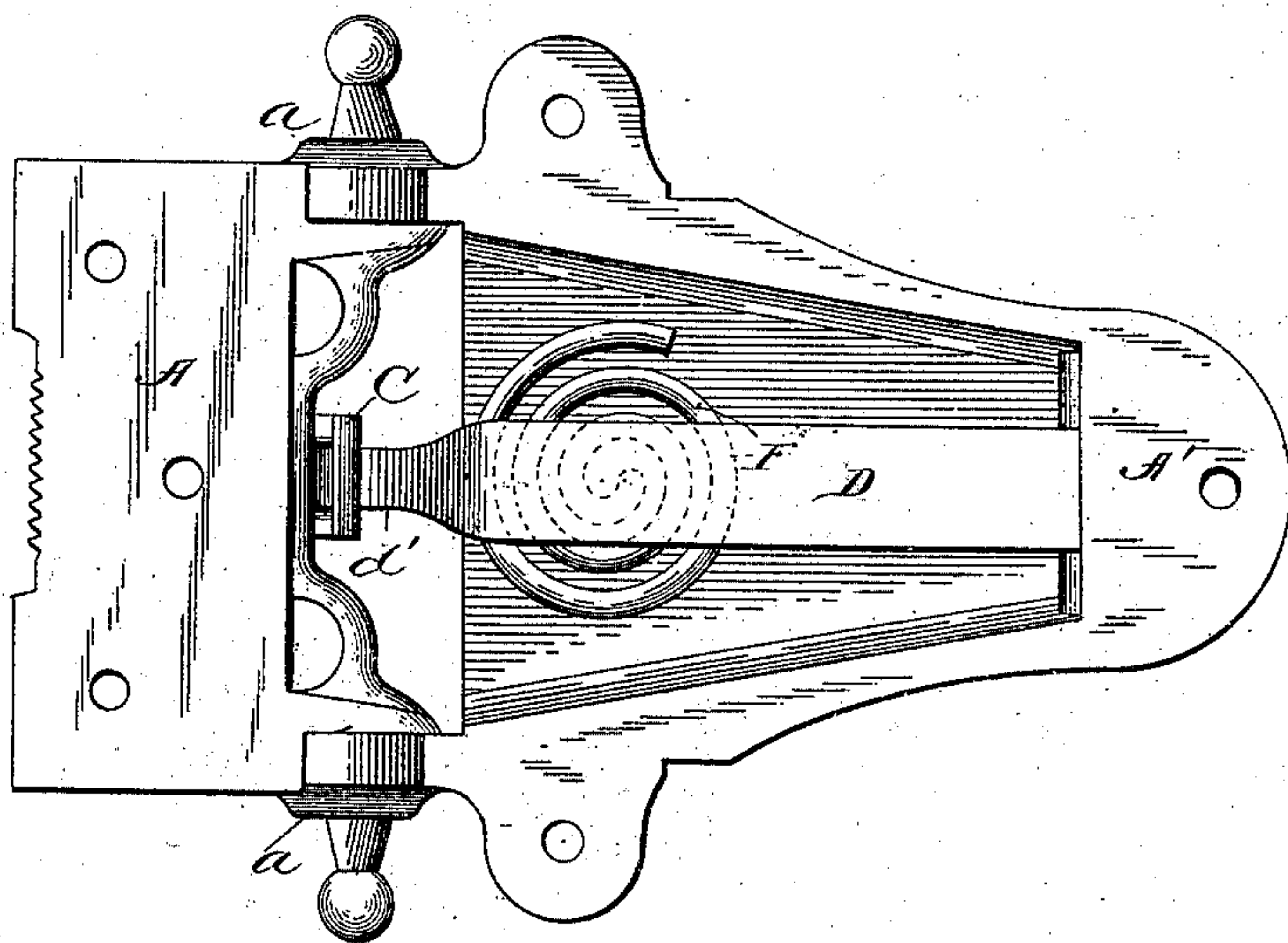


Fig. 5.



Witnesses:

Henry S. Rohrer.
Jas. W. Huston.

Inventor:

James W. Coultas
By Miles Greene & Peterson
Attys.

(No Model.)

J. W. COULTAS.
SPRING HINGE.

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Fig. 6.

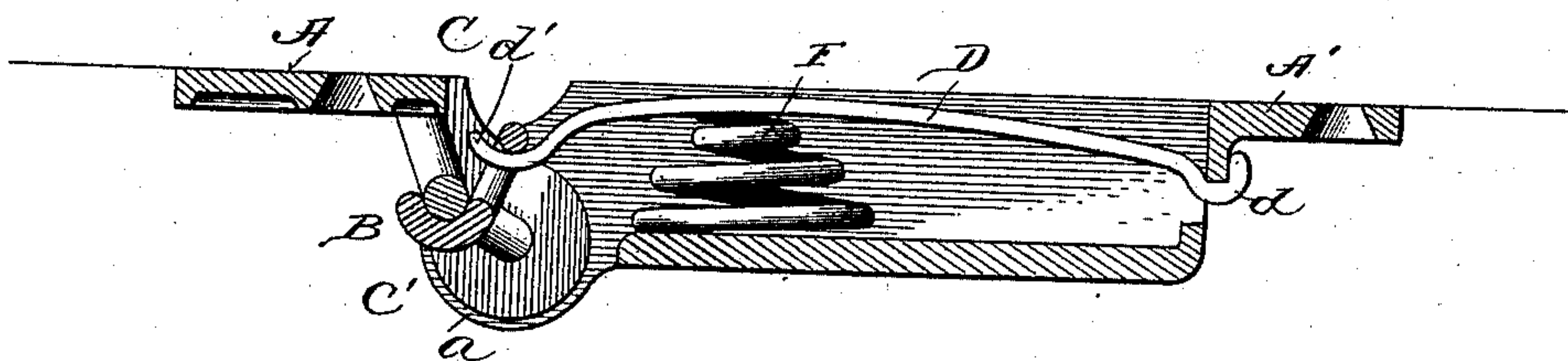


Fig. 7.

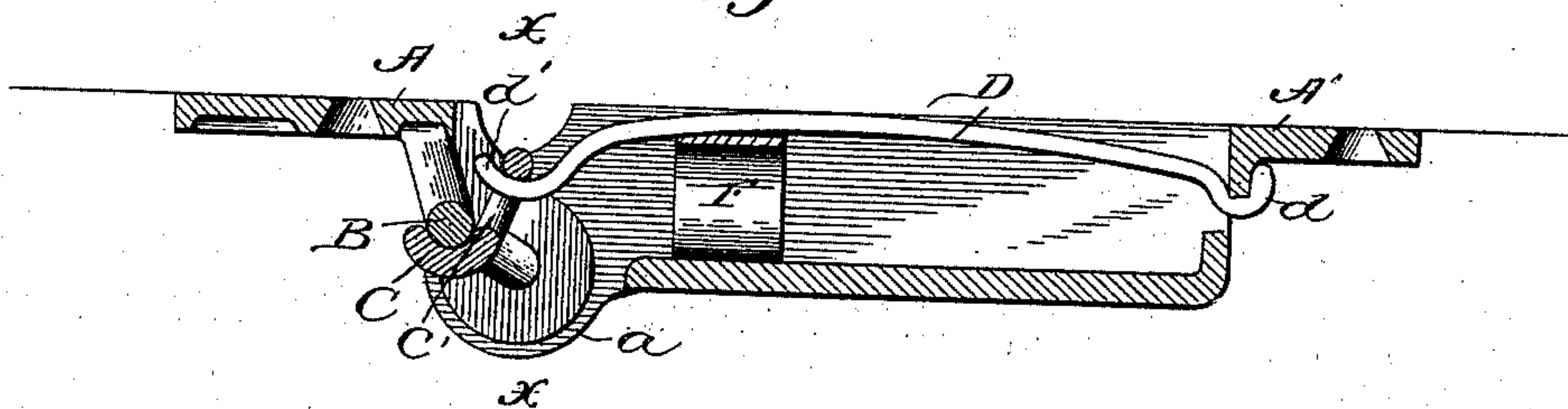
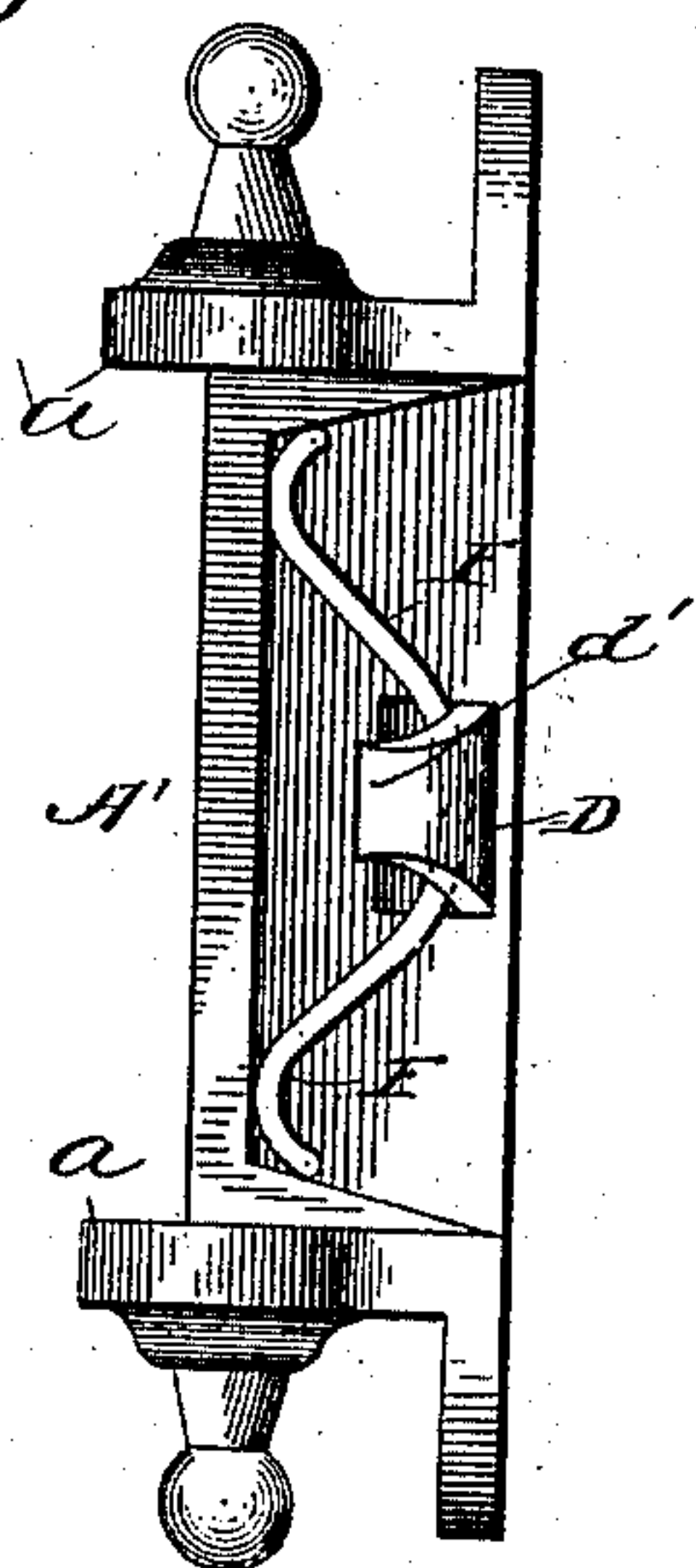


Fig. 8.



witnesses:
Henry B. Rohrer.
Jas. W. Graham.

Inventor:
James W. Coultas
By *Wm. H. Allen & Son*
Attys.

UNITED STATES PATENT OFFICE.

JAMES W. COULTAS, OF HAVANA, ILLINOIS.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 505,193, dated September 19, 1893.

Application filed August 19, 1892. Serial No. 443,498. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. COULTAS, a citizen of the United States of America, residing at Havana, in the county of Mason 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 of that class in which the spring is supported by one leaf of a hinge and applies its force to the other in such a way as to swing it in one direction when it is in certain positions, and to swing it in the opposite direction when it is in other positions. Hinges of this class are known as reversing or hold back hinges, and the point at which the moving leaf changes its direction of motion is known as the dead point of the hinge.

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

Figure 1 is a rear elevation of a hinge embodying my invention, the pintle line of the hinge being in a vertical position, and the two leaves of the hinge being in the same plane. Fig. 2 is a central horizontal section of the hinge, its parts being in the same positions shown in Fig. 1. Fig. 3 is a similar view of the hinge when fully open. Fig. 4 is a central horizontal section of a modified form of hinge embodying my invention. Fig. 5 is a rear elevation of another modification of my hinge, the two leaves being in the same plane. Fig. 6 is a central horizontal section of the hinge shown in Fig. 5. Fig. 7 is a central horizontal section of another modification; and Fig. 8 is a vertical section of the spring supporting leaf and the part supported thereby, the plane of section being through the line $x-x$, Fig. 7.

In Figs. 1, 2 and 3, A, A', are two leaves connected by knuckles a, a , of suitable construction permitting rotation of the leaves with reference to each other through an angle of about one hundred and eighty degrees. The leaf A, is provided at a point between the knuckles with an integrally formed rod B, parallel to the axis or pintle line of the hinge, but eccentric with reference thereto, its position being between the axis and the rear face of the leaf, and being also preferably on the

same side of the axis as the leaf itself. The rod B, is held in place and strengthened by integrally formed braces of suitable shape and position, those shown in the drawings being of desirable construction. The leaf A', has in its rear face a box-like cavity within which lies a horizontally placed lever D, whose outer end d , is secured in the end of the case, while its inner end is formed into a hook d' , engaging a stirrup C', provided at its upper end with a hook C, which engages the rod B, upon the leaf A. Between the lever D, and the front face of the box, or case, is placed a coiled spring F, so constructed that when the parts are in the positions shown in Figs. 1 and 2, the spring is considerably compressed and exerts a force tending to press the free end of the lever D, away from the rod B, with which it is connected by means of the stirrup C, and thereby to maintain the relation of the leaves to each other and hold the spring in its closed position. The swinging of the leaf A, in the direction indicated by the arrow, Fig. 2, still further compresses the spring until the dead point of the hinge is reached, that is to say, until the leaves reach such a position that the stirrup, C, the rod B, and the axis of the hinge are all in the same plane. After this point is passed, the further swinging of the leaf A, in the direction indicated, decreases the compression of the spring, and the force of the spring therefore tends to throw the leaf to the position shown in Fig. 3, and to hold the hinge in its completely open position. In a hinge of the form shown in the figures thus described, the spring may evidently be applied at any point between the ends of the lever. The outer end of the lever D, may be secured in the end of the case in any suitable and desirable manner, but I prefer to use the construction shown in Fig. 2, in which the end of the lever is carried through the wall of the case, and formed with a slight bend which engages a shoulder on the case and locks the lever against longitudinal movement toward the leaf A.

Fig. 4 shows a hinge in which the fulcrum of the lever is at its center, and the spring is applied to its outer end. In this case, the spring must be placed between the free end of the lever and a suitable projection on the rear face of the case in substantially the man-

ner shown in the drawings. Where this form is used, the lever may be locked against longitudinal movement by forming it with a bend, or notch, at a point where it engages the fulcrum.

The hinge shown in Figs. 5 and 6, is the same as that shown in Fig. 1, except that the spring, interposed between the lever and the case, is coiled in the form of a cone, so that as it is compressed, each coil of the spring may lie within the next succeeding larger coil. This construction adds very greatly to the range of movement of the spring and of that part of the lever to which it is applied, and while not absolutely essential to the practical operation of the hinge, is a material advantage, since it greatly increases the working efficiency of such a spring as can be placed within the limits of a leaf of suitable size and attractive appearance. I have found in practice, that by the use of this coned form of spring it is possible to get all the range and all the power necessary for a hinge of given size without exceeding the usual and ordinary limits of size of the leaves of such hinges. It is evident that a spring of the form shown in Figs. 5 and 6, can be equally well applied in the position occupied by the spring in the form shown in Fig. 4.

Figs. 7 and 8 show a hinge similar to those shown in Figs. 1, 2, 3, 5, and 6, except that a curved bowspring is substituted for the coiled springs shown in those figures. Its force is exerted in the same direction as that of the springs shown in those figures, and the operation of this hinge is the same as that already explained.

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

1. In a spring hinge, the combination of two leaves of suitable form connected by knuckles forming a hinge joint, one of said leaves being provided with a rod eccentric to the axis of the hinge, and the other being formed with a chamber, or case, a hook engaging said rod and formed with a stirrup, a lever lying in said chamber and supported by a fulcrum therein and having one of its ends in engagement with said stirrup, and a spring interposed between the wall of said chamber, and a suitable point upon said lever, and exerting its force through said lever upon the

rod formed upon the other leaf; substantially as shown and described.

2. In a spring hinge, the combination of two leaves of suitable form connected by knuckles forming a hinge-joint one of said leaves being provided with a rod eccentric to the axis of the hinge, and the other being formed with a chamber or case, a hook engaging said rod and formed with a stirrup, a lever lying in said chamber, and supported by a fulcrum therein and having one of its ends in engagement with said stirrup, and a coiled spring interposed between the wall of said chamber, and a suitable point upon said lever, and adapted to be compressed by the swinging of the leaves of the hinge from their completely closed position; substantially as shown and described.

3. In a spring hinge, the combination of two leaves of suitable form connected by knuckles forming a hinge joint, one of said leaves being provided with a rod eccentric to the axis of the hinge, and the other being formed with a chamber, a hook engaging said rod and formed with a stirrup, a lever lying in said chamber and supported by a fulcrum therein, and having one of its ends in engagement with said stirrup, and a coiled spring interposed between the wall of said chamber and a suitable point upon said lever and adapted to be compressed as the hinge is opened, the successive coils of said spring being of increasing diameter from one end of the spring toward the other whereby as the spring is compressed, each coil may lie within the one next succeeding it; substantially as shown and described.

4. The combination of the leaves A, A', formed and connected substantially as described, the stirrup C, C', engaging the rod B, upon the leaf A, the lever D, lying within the chamber in the leaf A', and having its inner end in engagement with said stirrup and its outer end provided with a bend engaging the wall of the chamber, and a spring F, interposed between the lever and the wall of the chamber and operating substantially as described.

JAMES W. COULTAS.

Witnesses:

R. H. WILES,
A. I. H. EBBESEN.