

(No Model.)

H. L. FERRIS.  
SPRING HINGE.

No. 414,201.

Patented Nov. 5, 1889.

Fig 1.

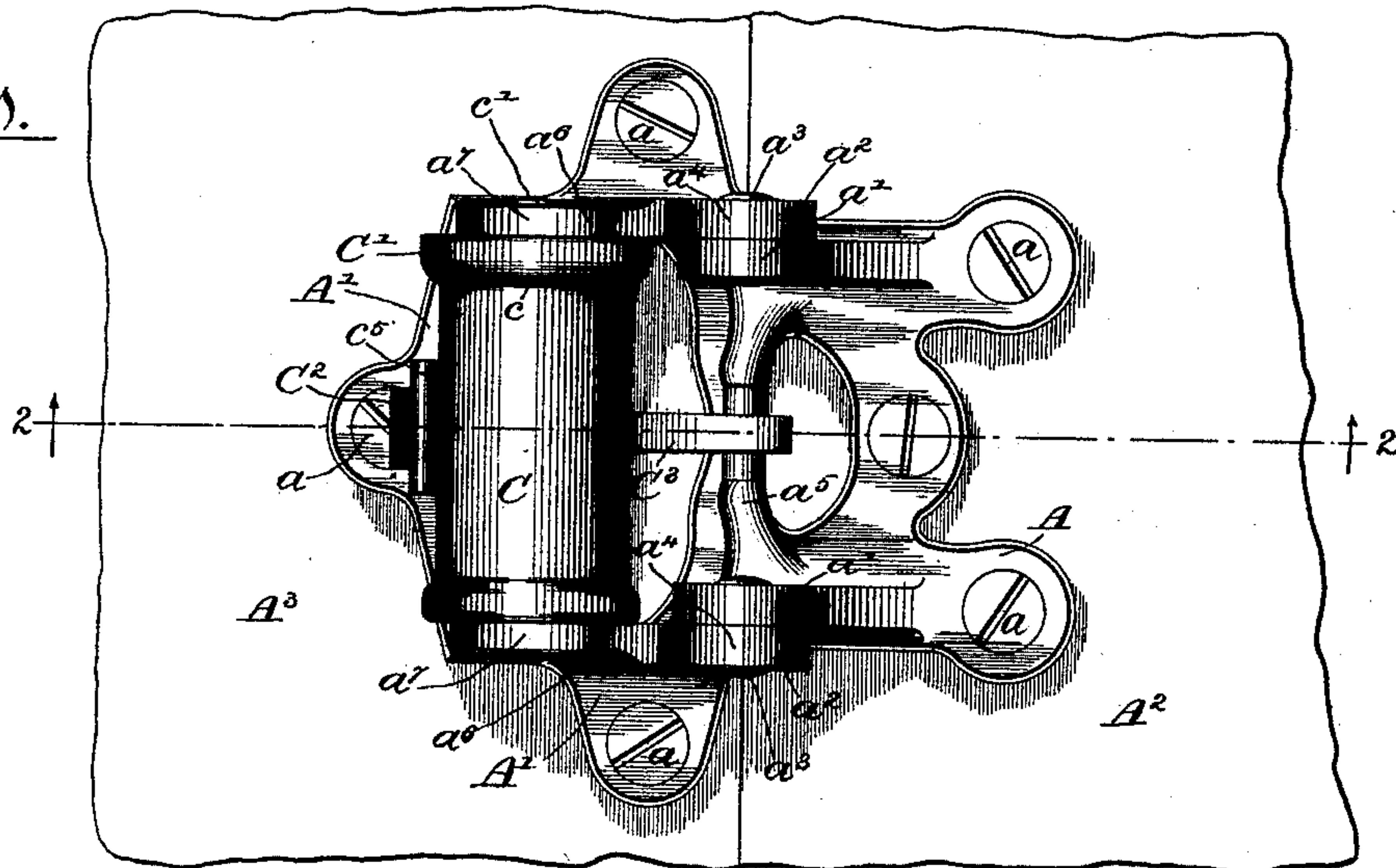


Fig 2.

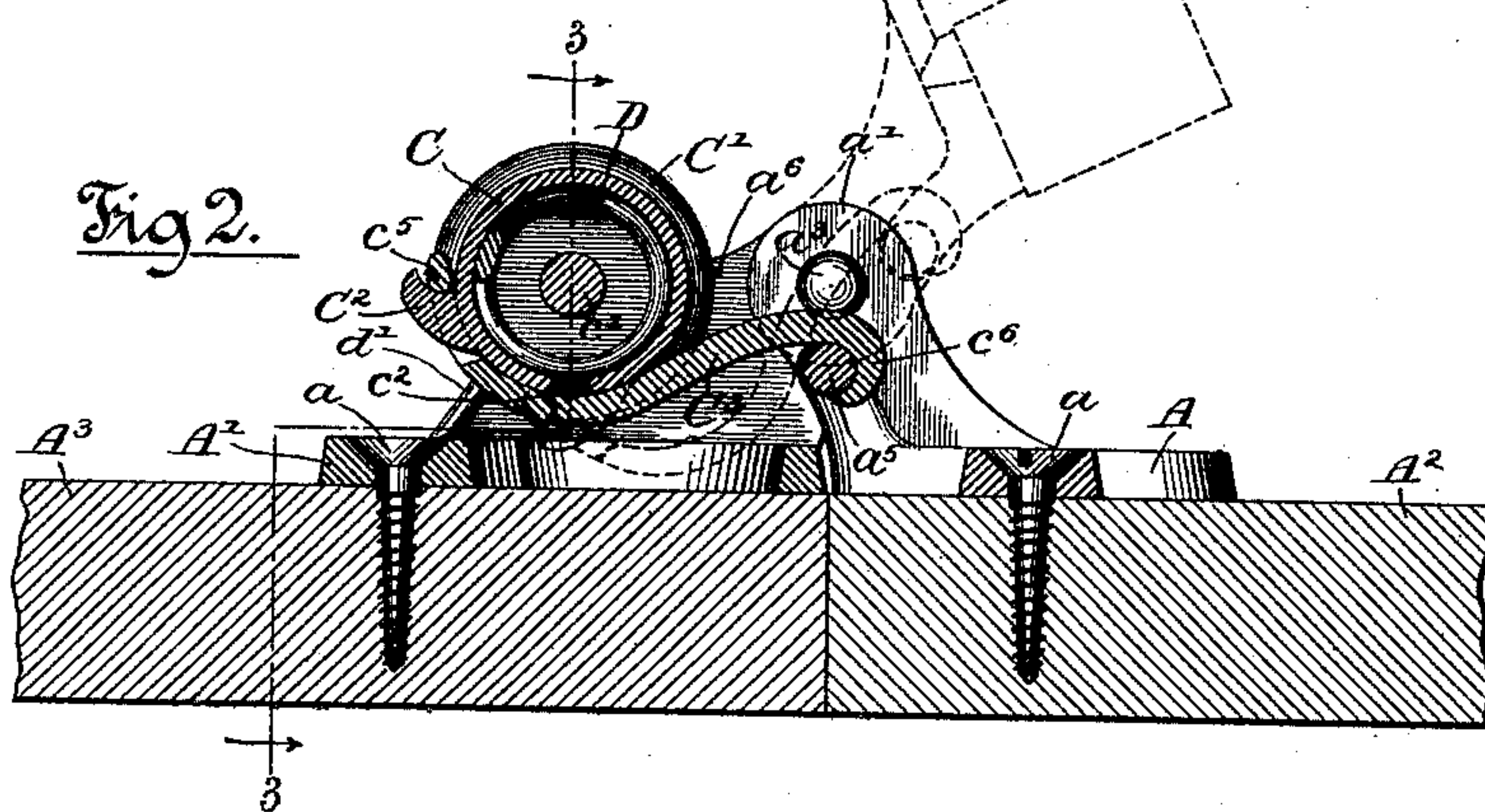


Fig 3.

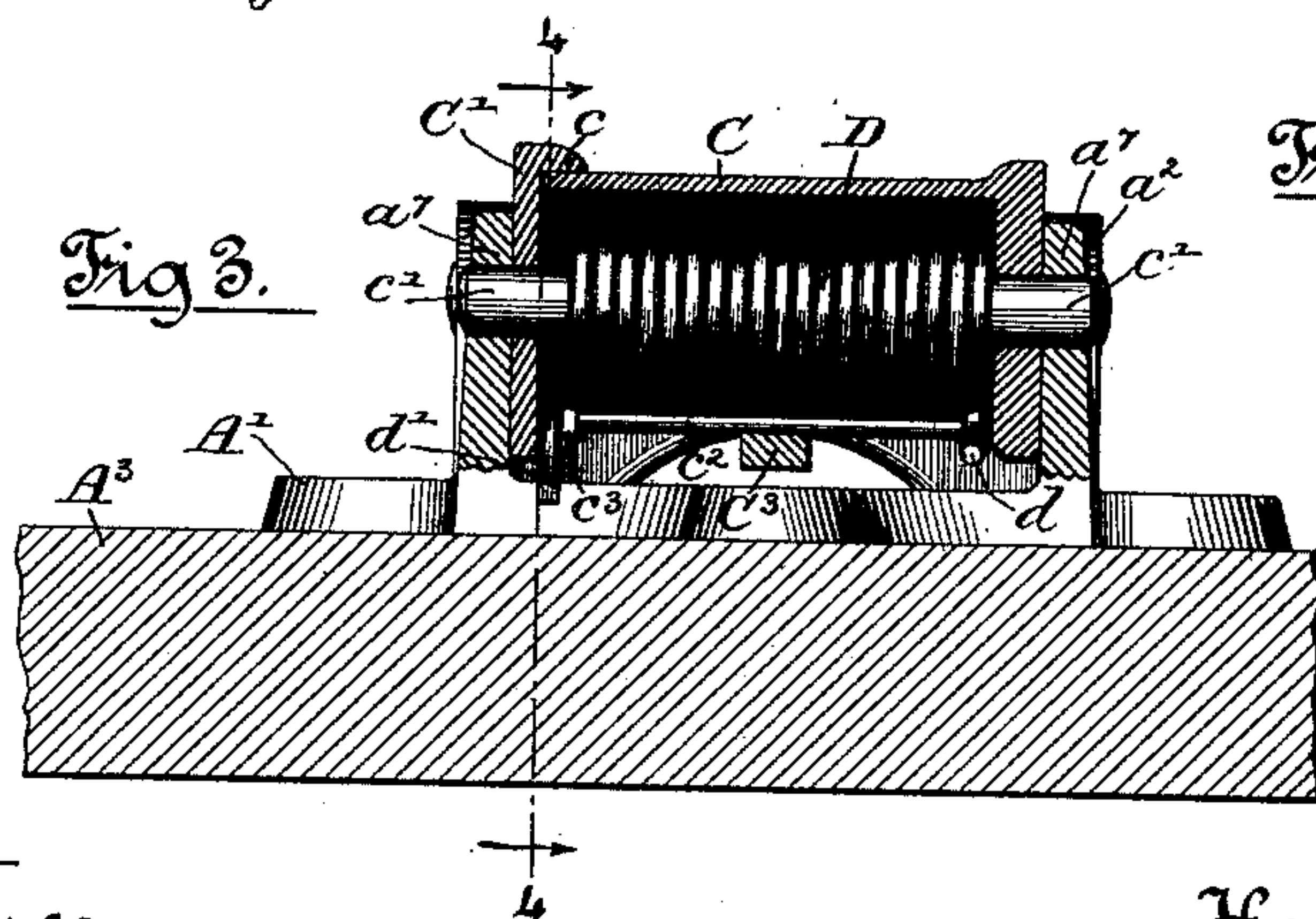
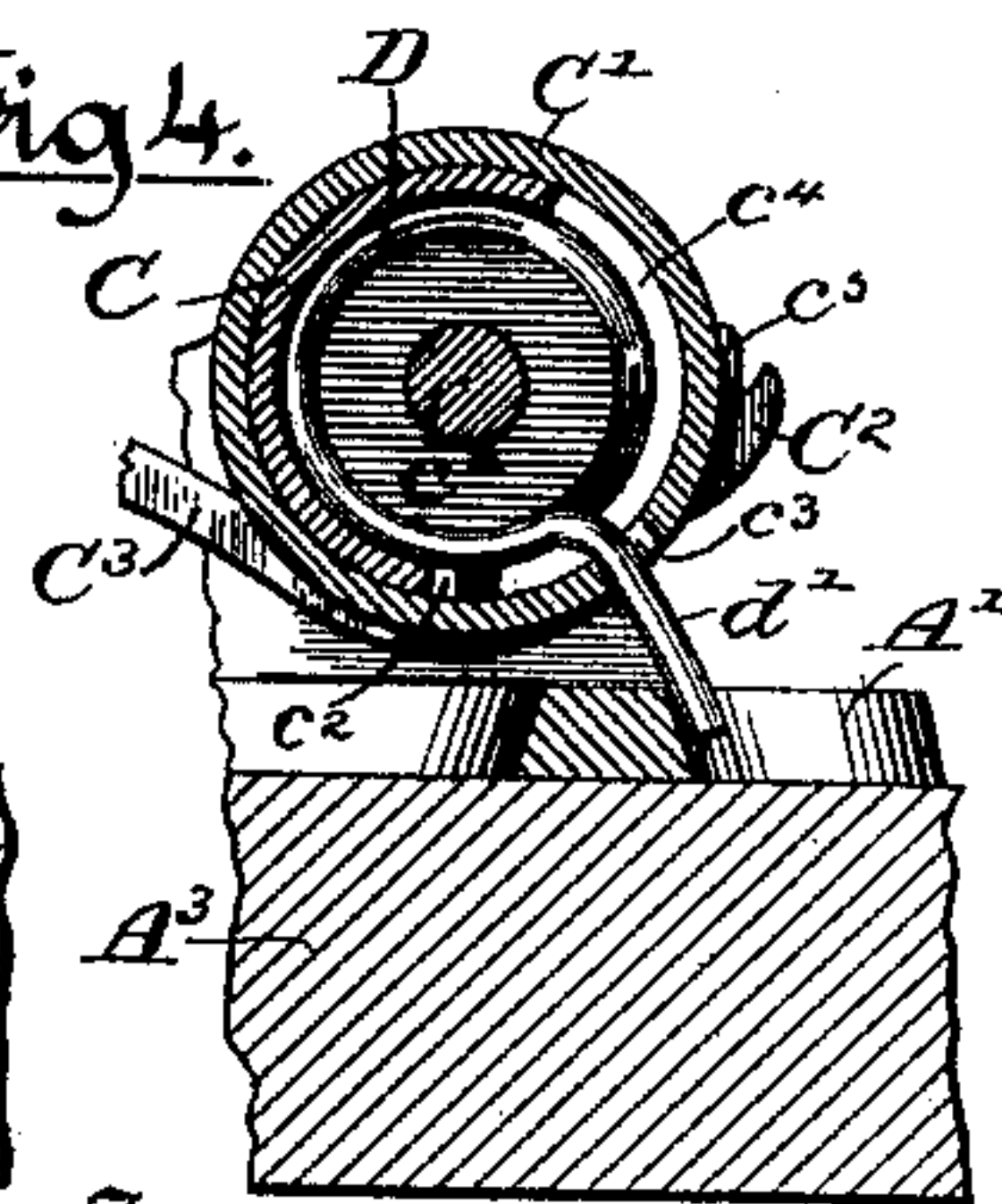


Fig 4.



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# UNITED STATES PATENT OFFICE.

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## SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 414,201, dated November 5, 1889.

Application filed June 11, 1889. Serial No. 313,830. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY L. FERRIS, of Harvard, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Spring Door-Hinges; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to a novel construction in spring-hinges of that class wherein the action of the spring upon the leaves of the hinges is reversed when the leaves assume a certain relative position either in the opening or closing operation.

The invention consists in the novel features of construction and combinations of parts hereinafter fully described, and pointed out in the appended claims.

In the drawings, Figure 1 is a plan view of a hinge embodying my invention applied to a door and door-frame. Fig. 2 is a central vertical sectional view of the same, taken on the line 2 2 of Fig. 1. Fig. 3 is a vertical transverse sectional view of the same, taken on the line 3 3 of Fig. 2. Fig. 4 is a vertical transverse sectional view taken on the line 4 4 of Fig. 3.

In said drawings, A A' are leaves of the hinge, secured to a door A<sup>2</sup> and door-frame A<sup>3</sup>, respectively, by means of screws *a a* or other suitable means. Each leaf is provided with raised lugs *a' a'* and *a<sup>2</sup> a<sup>2</sup>*. The lugs *a' a'* are arranged adjacent to each other, and are each provided with outwardly-extended pivots or trunnions *a<sup>3</sup> a<sup>3</sup>*, which enter bearings *a<sup>4</sup> a<sup>4</sup>* formed upon the lugs *a<sup>2</sup> a<sup>2</sup>*. The leaf A is provided with a raised arm or cross-bar *a<sup>5</sup>*, located between the lugs *a' a'*, and having its central or bearing position below and in line with the axis of the trunnions. The leaf A' is provided in the rear of the lugs *a<sup>2</sup> a<sup>2</sup>* with supplemental lugs *a<sup>6</sup> a<sup>6</sup>*, having bearings *a<sup>7</sup> a<sup>7</sup>* therein.

C is a barrel, closed at one end, the other end of which rests within an inwardly-projecting annular flange *c*, formed upon a head or cap C'. The closed end of the barrel C

and the head C' are each provided with a central opening, through which passes a shaft or pin *c'*, the ends of which shaft or pin rest within the bearings *a<sup>7</sup> a<sup>7</sup>*. The said shaft is secured within the said bearings, and the barrel is adapted to freely revolve upon the shaft. The said barrel C is provided on one side with a longitudinal slot *c<sup>2</sup>*, which extends throughout its entire length. The barrel C is located on the leaf A, upon that side not adjacent to the other leaf, and is positioned so that its axis is parallel with the axis of the pivots or trunnions *a<sup>3</sup>*.

D is a coiled-wire spring arranged within the barrel C, and confined therein by having one of its ends *d* (the one adjacent to the closed end of the barrel) passing through the longitudinal slot *c<sup>2</sup>*, which slot *c<sup>2</sup>* serves to prevent the said spring from turning within the barrel. The other end *d'* of the said spring passes through a notch *c<sup>3</sup>* formed in the flange *c*, and has a bearing at its extreme end upon the outer margin of the leaf A'. The edge of the barrel adjacent to its open end and within the flange *c* is recessed or cut away, as at *c<sup>4</sup>*, to permit the passage of the end *d'* of the spring, which end is thus held securely by reason of its bearing upon the said leaf A', and to allow said barrel to revolve, as will be explained hereinafter.

C<sup>2</sup> is a projecting lug or hook formed upon the barrel C, which lug or hook is connected with the cross-bar *a<sup>5</sup>* of the leaf A by means of a link C<sup>3</sup>. This link C<sup>3</sup> is provided at one end with a loop *c<sup>5</sup>*, which passes over the lug C<sup>2</sup> upon the barrel, and at its other end provided with a hook *c<sup>6</sup>*, which engages with the cross-bar *a<sup>5</sup>*.

The operation of the invention is as follows: When the door A<sup>2</sup> is opened, as shown in dotted lines in Fig. 2, the cross-bar *a<sup>5</sup>* describes the arc of a circle about the pivots or trunnions *a<sup>3</sup> a<sup>3</sup>* as a center. The movement of said cross-bar is communicated by means of the link C<sup>3</sup> and lug C<sup>2</sup> to the barrel, and causes the latter to describe a partial revolution; hence it will be manifest that in opening the door from the closed position illustrated in Fig. 2 in full lines to the partially-open position shown in dotted lines in said



figure sufficient pressure must be exerted to turn the barrel C against the twisting action of the spring D, which is connected with said barrel at one end and with the leaf A' at its other end. When the door is still further opened—that is, when the line of draft between the cross-bar and lug C passes to the other side of the pivots  $a^3 a^3$ —the spring will tend to resume its normal position to untwist, which will have the effect of opening the door to its fullest extent. The door will be held in either its opened or closed position by the spring, as will be entirely obvious, until force is exerted sufficiently to overcome its action and move the line of draft between the lug and the cross-bar to one side or the other of the center of the said pivots.

I have shown in said drawings the loop end of the link as curved slightly, so that when the door is in either its opened or closed position the said curved portion will pass under and partially around the barrel, and said loop end of the link will engage the lug on the barrel at a point almost diametrically opposite the point where the other end of the link is connected with the cross-bar. It has been found by experience that by arranging said parts in this manner and connecting the spring, as shown and described, greater pressure will be required to accomplish the first movement of the door from either the open or closed position than will be required to finish the movement, owing to the fact that at first the line of draft is not located tangentially to said barrel, as it afterward is, but is through the same and has its ends almost diametrically opposite.

I claim as my invention—

1. A spring-hinge comprising two leaves  
40 pivotally secured together at their adjacent

ends, a barrel mounted in bearings on one of said leaves, one side of and parallel with the pivot-pins which unite said leaves, a spring located within said barrel, said spring being connected at one end to said barrel and at the other end to the leaf on which the barrel is mounted, and a link connecting the barrel with the other leaf, substantially as specified.

2. A spring-hinge comprising two leaves pivotally secured together at their adjacent ends, a longitudinally-slotted barrel loosely mounted in bearings upon one leaf, one side of the pivots which unite said leaves, said barrel resting at its open end within an inclosing-cap and being pivotally secured to the other leaf, a coiled spring located within said barrel, one end of which is in engagement with the slot in the barrel and the other end is secured to the adjacent leaf, substantially as described.

3. In a spring-hinge, the combination, with two leaves A and A', pivotally secured together at their adjacent ends, of a barrel loosely mounted in bearings upon the leaf A, parallel with the pivot-pins  $a^3$ , a spring secured at one end to said barrel and at its other end to the leaf A, adapted to impart a rotary motion to said barrel, and a link pivoted at one end of the leaf A' at a point removed from the line of the hinge-pivots and at its other end to the said barrel at a point distant from the said leaf A, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

HENRY L. FERRIS.

Witnesses:

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WM. G. THOMPSON.