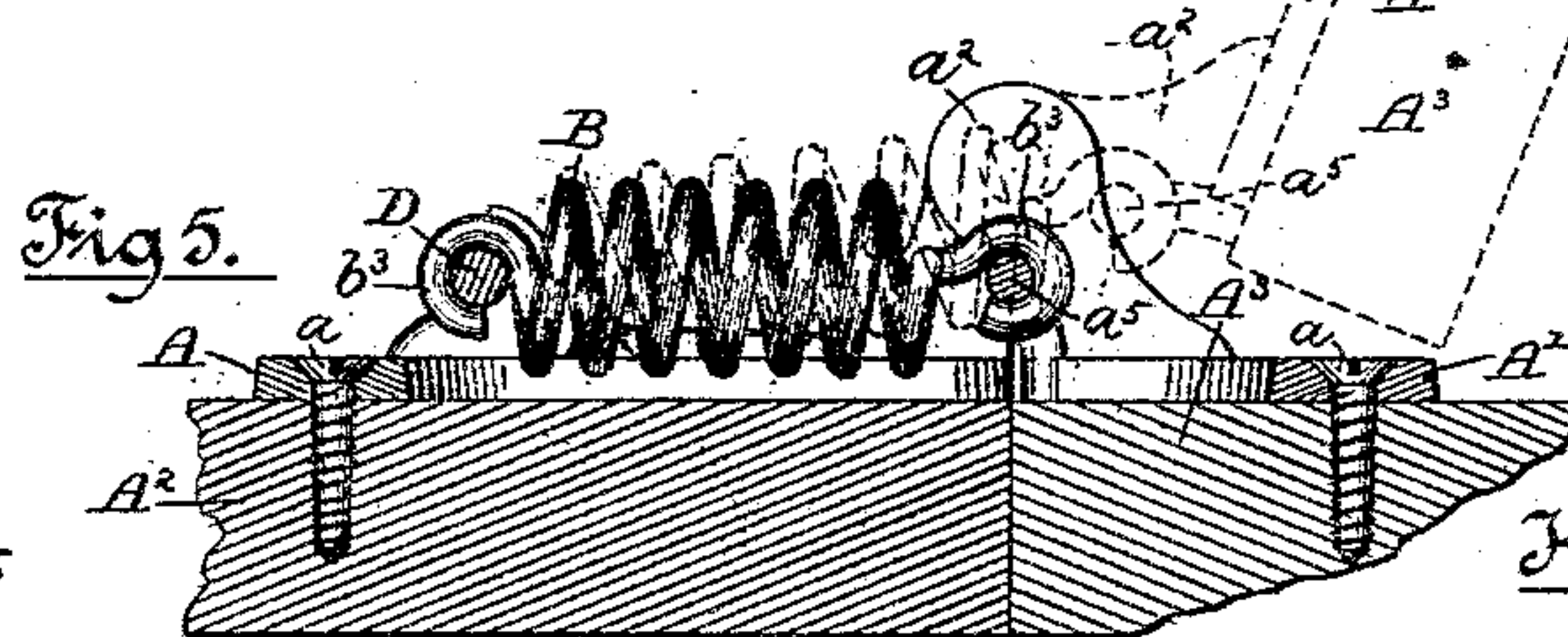
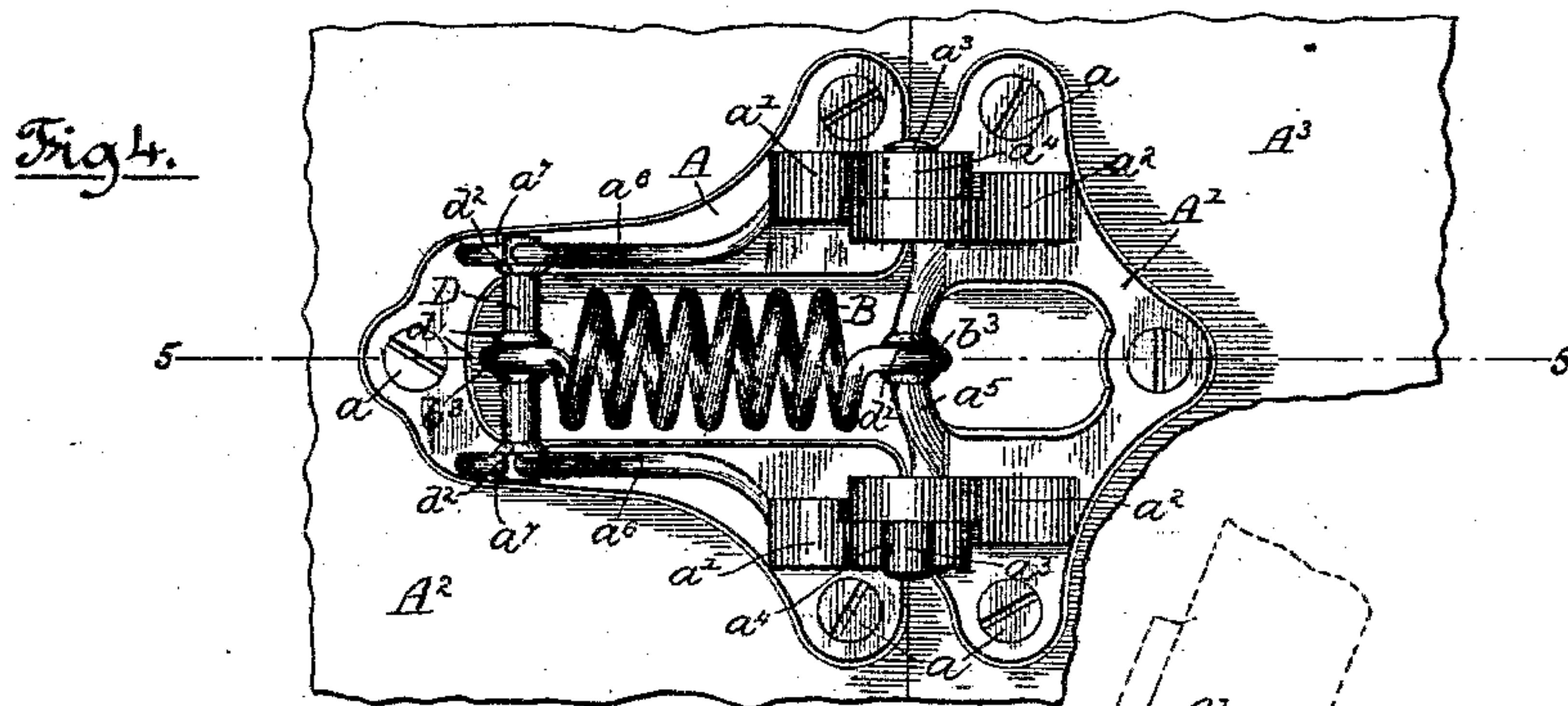
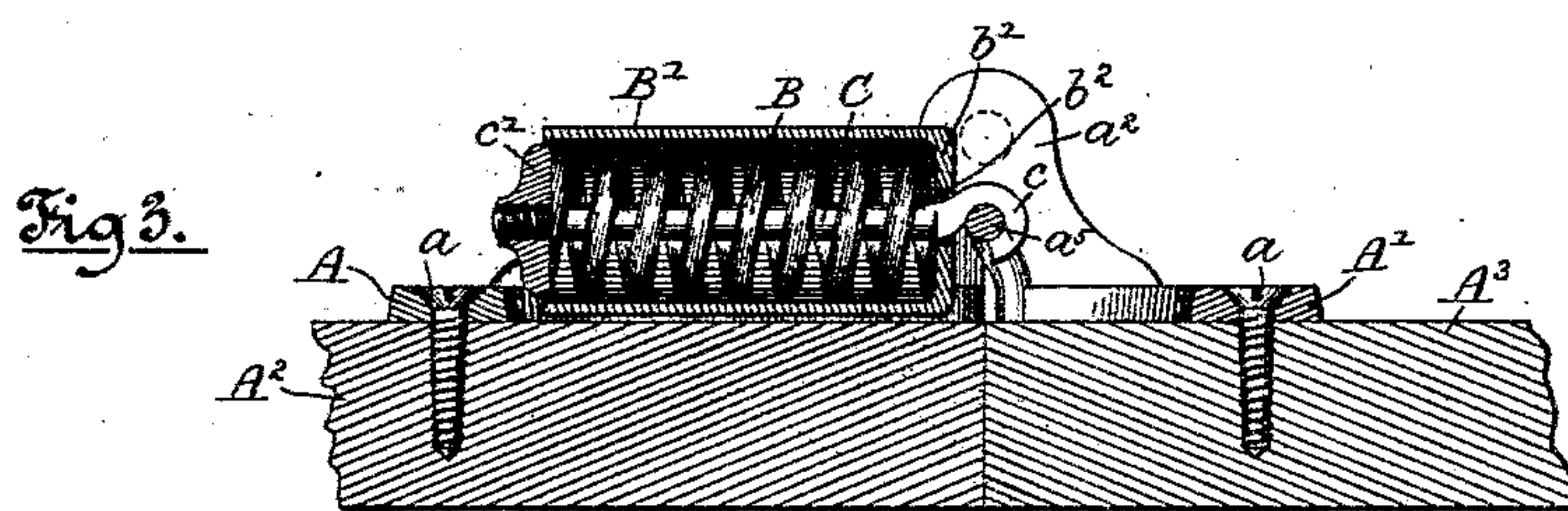
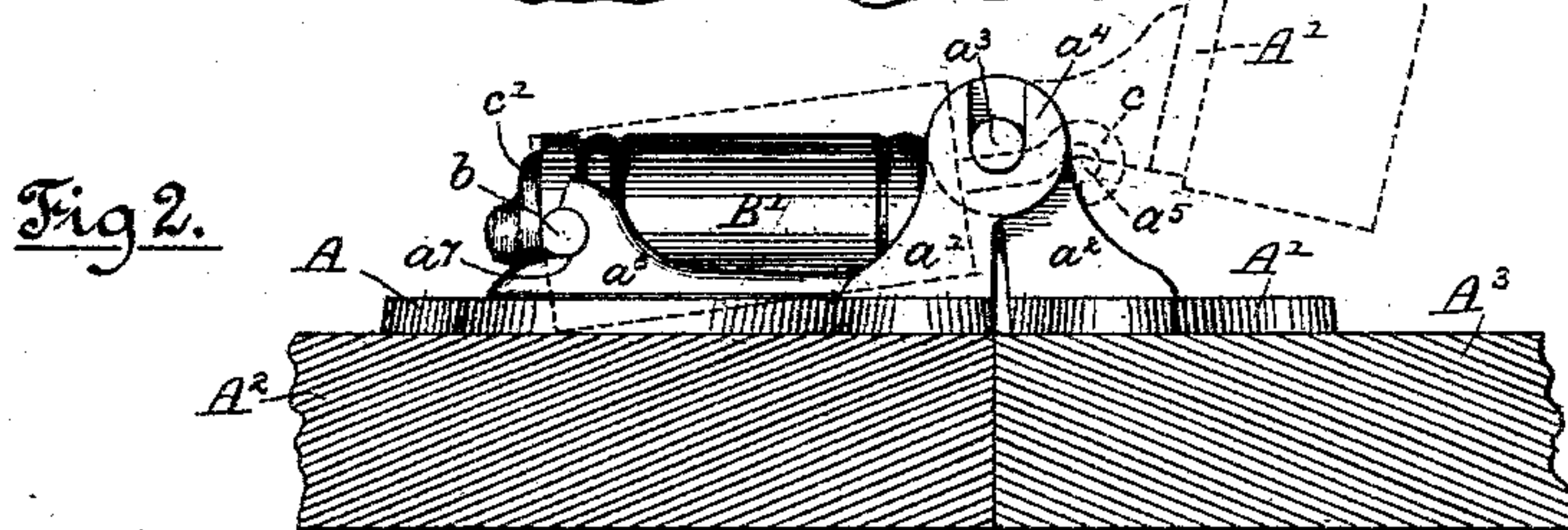
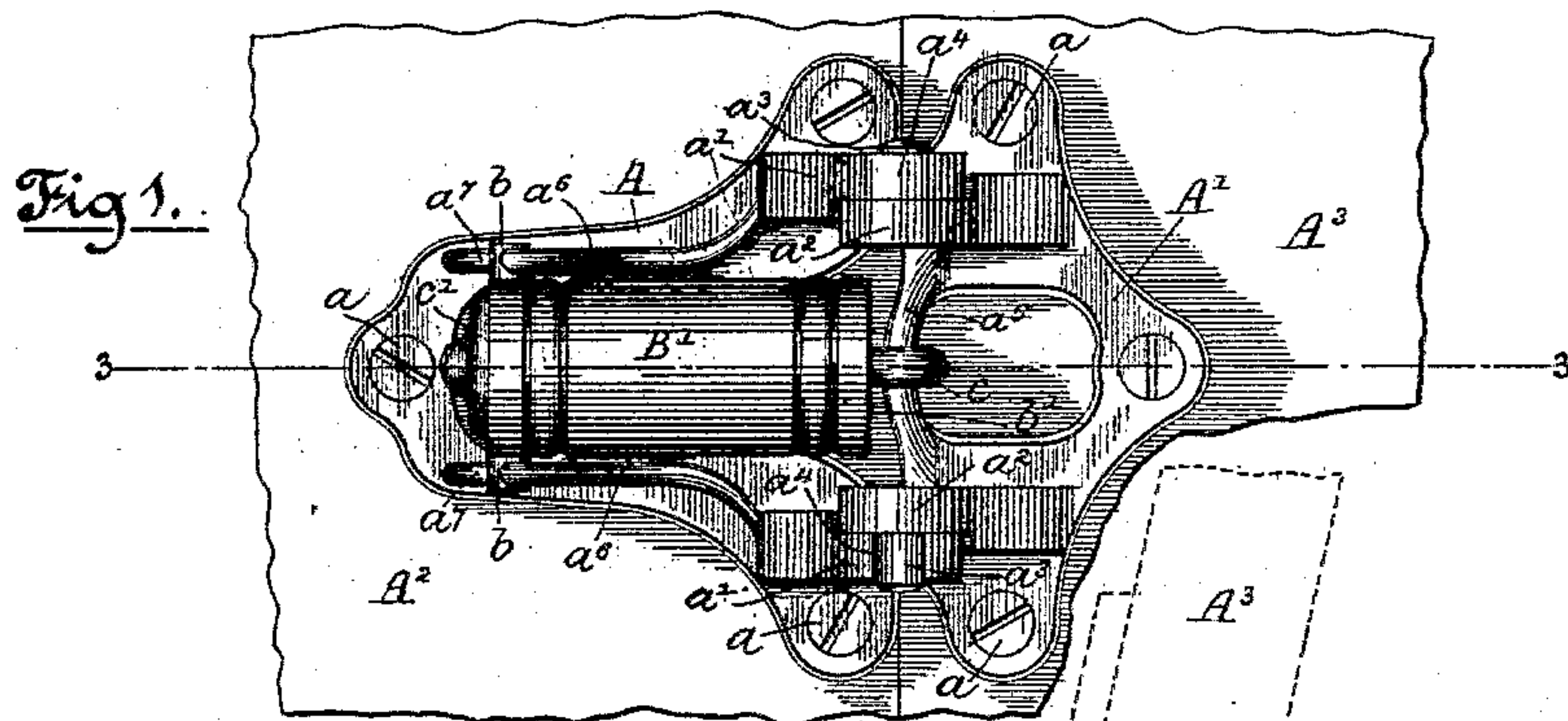


(No Model.)

H. L. FERRIS.
SPRING HINGE.

No. 411,956.

Patented Oct. 1, 1889.



Witnesses
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SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 411,956, dated October 1, 1889.

Application filed January 24, 1889. Serial No. 297,421. (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-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 improvements in spring-hinges; and it consists in the novel construction illustrated, described, and more particularly pointed out in the appended claims.

Figure 1 is a plan view of my invention applied to a door and door-frame. Fig. 2 is a side view of the same, showing by dotted lines a door partly open. Fig. 3 is a central vertical sectional view of the same, taken upon line 3 3 of Fig. 1. Fig. 4 illustrates in plan view a slightly-modified form of the invention. Fig. 5 is a vertical sectional view of the same, taken upon line 5 5 of Fig. 4.

In said drawings, A A' are the leaves of the hinge; attached to the door-frame A² and door A³, respectively, by screws *a* in the usual manner. Each leaf is provided with the usual raised lugs *a'* *a*², whereby the leaves are united in the ordinary manner. The lugs *a*² of the leaf A' being adjacent to each other are each provided with outwardly-extended pivots or trunnions *a*³. The lugs *a'* are provided with the usual bearings *a*⁴ for said trunnions *a*³. The leaf A' is provided with a raised arm or cross-bar *a*⁵, located between the lugs *a*², and having its central and bearing portion below and in line with the axis of the trunnions. The leaf A is deeper or longer than the leaf A', and is provided near each side margin with raised strengthening-flanges *a*⁶, extending from the lugs *a'* to near the opposite end of the leaf A. Said flanges *a*⁶ are enlarged near their outer ends, and are provided with a recess *a*⁷, suitable for pivot or trunnion bearings.

B is a spring located within a barrel B'. One end of this barrel is provided with pivots or trunnions *b*, adapted for pivotal engagement in the bearing *a*⁷ of the flange *a*⁶, the

other end of the barrel B' being free to oscillate. The end *b'* of the barrel adjacent to the leaf A' is provided with a central opening *b*². The other end of this barrel is open for the reception of the spring.

C is a rod secured by its hooked end *c* to the cross-bar *a*⁵, which rod passes through the opening *b*² in the closed end of the barrel B' centrally through the spring B and engages a plate *c'* at the other end of the barrel. The plate *c'* may be secured upon the rod C by screw-threads, as shown in Fig. 3, or by other convenient means. The diameter of the plate *c'* is less than the interior diameter of the barrel B', and the spring B is confined, as shown, between the end *b'* of the barrel and the plate *c'*. When the door A³ is opened, as indicated in dotted lines in Fig. 2, the cross-bar *a*⁵ describes the arc of a circle about the pivots or trunnions *a*³ as a center, the barrel B' turning on its pivots *b* to conform to the movements of the bar *a*⁵. The longitudinal axis of the spring B is thus kept coincident with the line of the draft upon it, which is a very material item in maintaining the power of the spring at its maximum.

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 on the door to draw the rod C through the opening *b*² against the action of the spring B. When the door A³ is opened still farther—i. e., when the center of the bearing-point of the bar *a*⁵ is just beyond the line of the barrel-pivots *b* and the hinge-pivots *a*³—the spring B will expand, and thus open the door to its fullest extent. The door will be held in either its opened or closed position by the spring, as will be readily understood, until pressure is exerted sufficiently to move the bearing *a*⁵ of the rod C one way or the other over the line drawn through the two pivots *b* and *a*³.

In Figs. 4 and 5 I have illustrated a construction slightly different from the above, but which is equally effective. In this form of the invention I dispense with the barrel B', rod C, and plate *c'*.

D is a bearing-pin or cross-bar, which may be integral with the leaf A, and be of the

same form as the cross-bar a^5 ; or it may be separate and located in the same bearings a^7 which held the pivots b of the barrel B' . The spring B is provided with turned-over or hooked ends $b^3 b^3$, which engage, respectively, the cross-bars a^5 and D.

While the operation of this hinge is precisely similar to the form shown in Figs. 1, 2, and 3, it will be noticed that the springs act in opposite directions—that is to say, the spring B in the barrel holds the door either in the open or closed position when expanded, while the spring B of Figs. 4 and 5 holds the door either open or closed when contracted.

In both cases the strain or draft on the spring is in line with its axis by reason of the movable bearing a^5 , to which one end of the spring B is secured, directly in the one case and indirectly in the other.

I have shown collars or flanges $d d'$ upon the cross-bars D and a^5 on either side of the ends b^3 of the spring B to more readily hold said ends in proper position upon said cross-bars; but said collars are not absolutely necessary. I may also place similar collars d^2 upon the cross-bar D, to prevent the latter from becoming disengaged from its bearings.

It will of course be understood that my invention operates with equal success if the leaf A is secured to the door A^3 , and the other leaf A' is secured to the door-frame A^2 .

What I claim is—

1. A spring-hinge comprising two leaves pivotally secured together at their adjacent ends, a spring located over one of said leaves, one end of said spring being pivotally secured to one leaf at a remove from the other leaf, the remaining end of said spring being pivotally secured to the second leaf at a point adjacent to the first leaf in line with but below and between the axis of the pivots which unite said leaves, substantially as described.

2. In a spring-hinge, the combination, with the leaves A A' , hinged together at their adjacent ends, of a tube B' , closed at one end and pivoted at its open end to the leaf A, a spring B located in said tube, a movable plate c' in engagement with one end of the spring B, and a rod C, secured at one end to said movable plate c' , and at its other end pivotally secured to the 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.