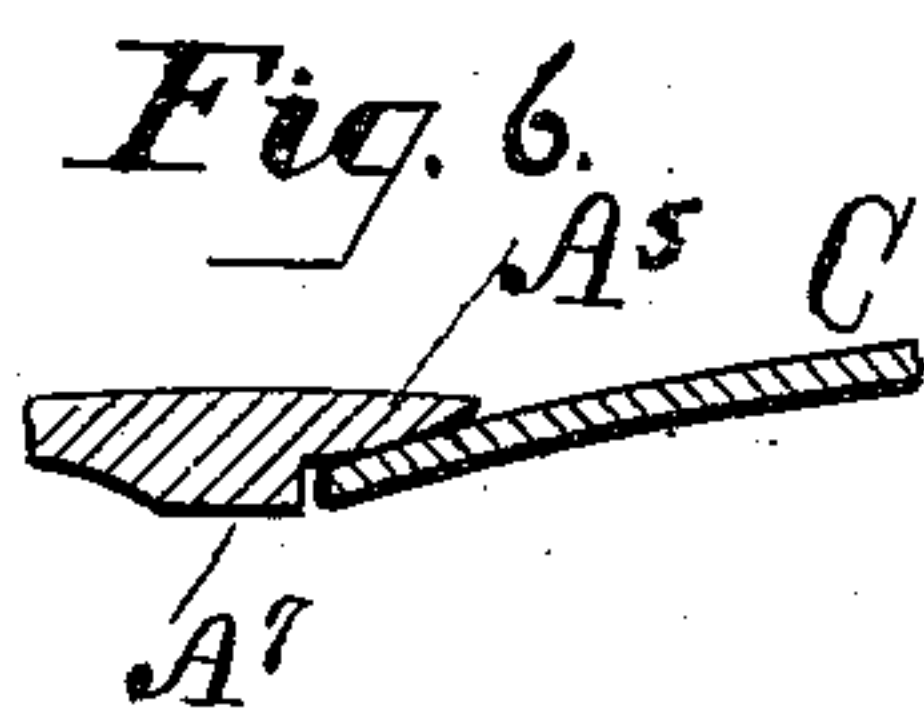
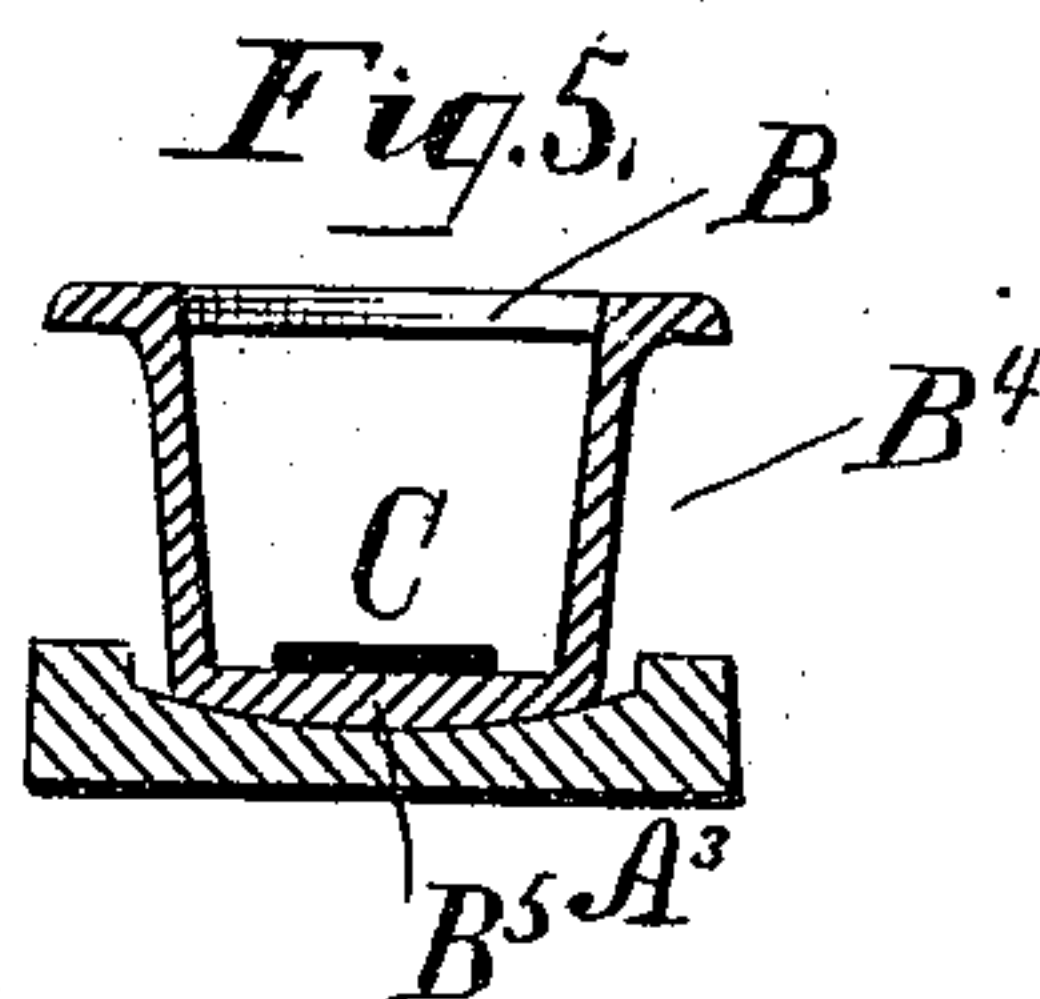
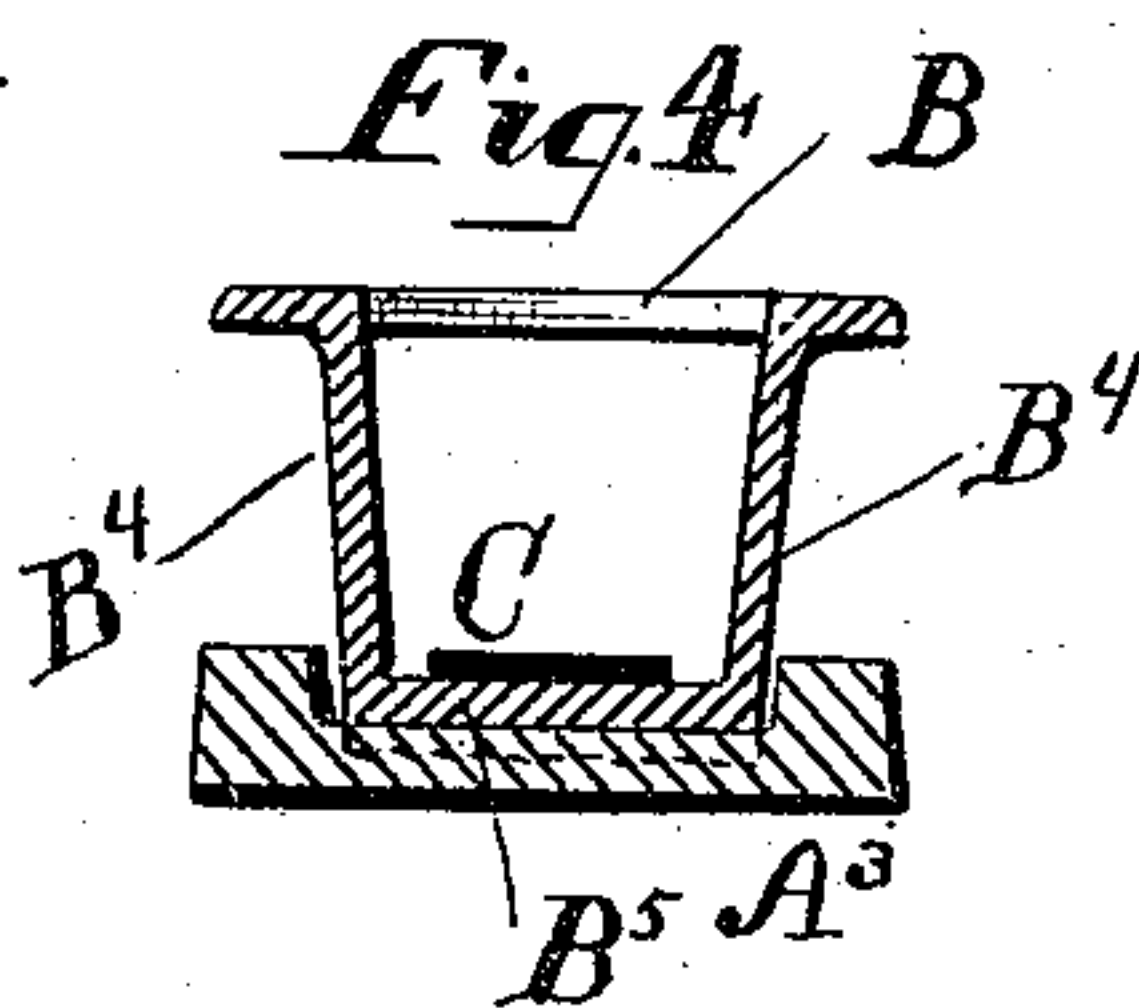
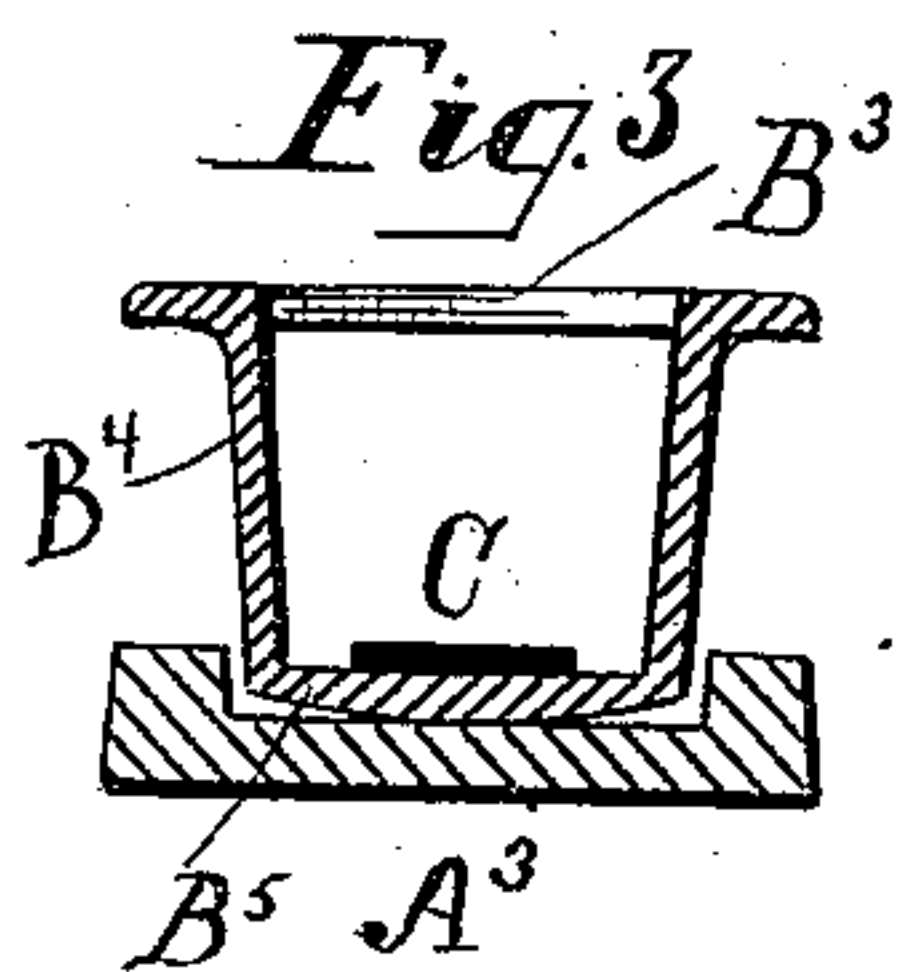
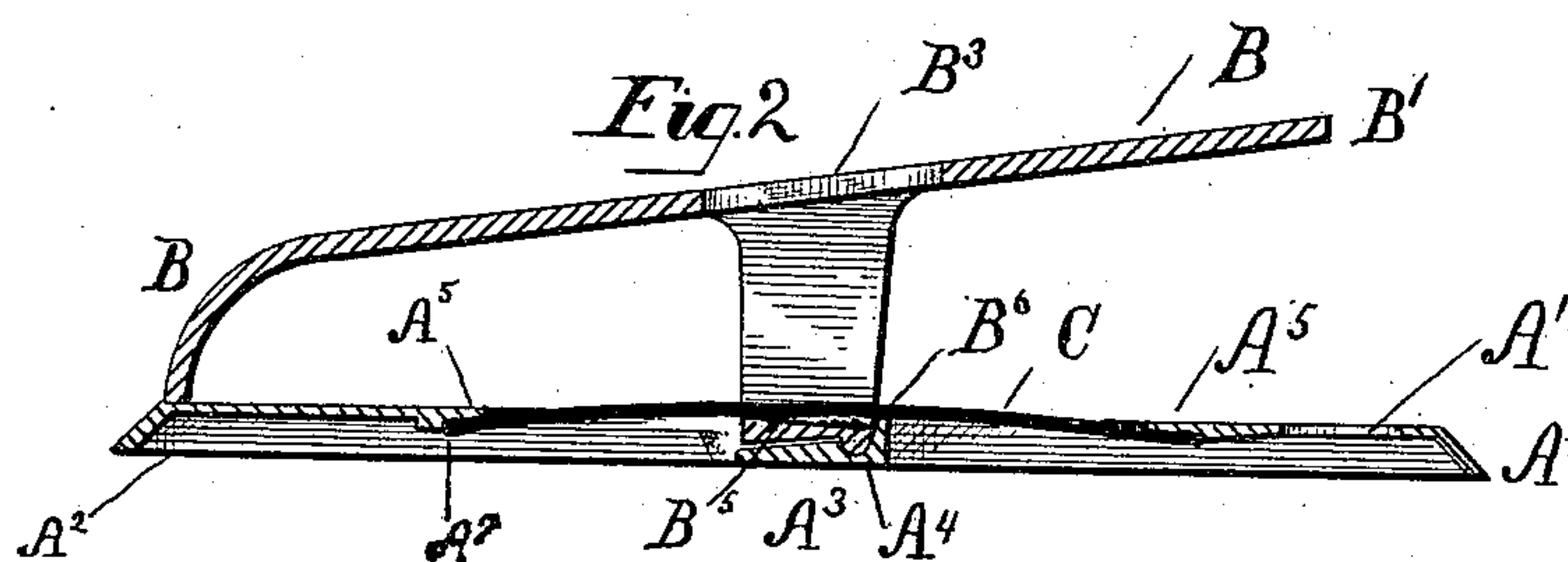
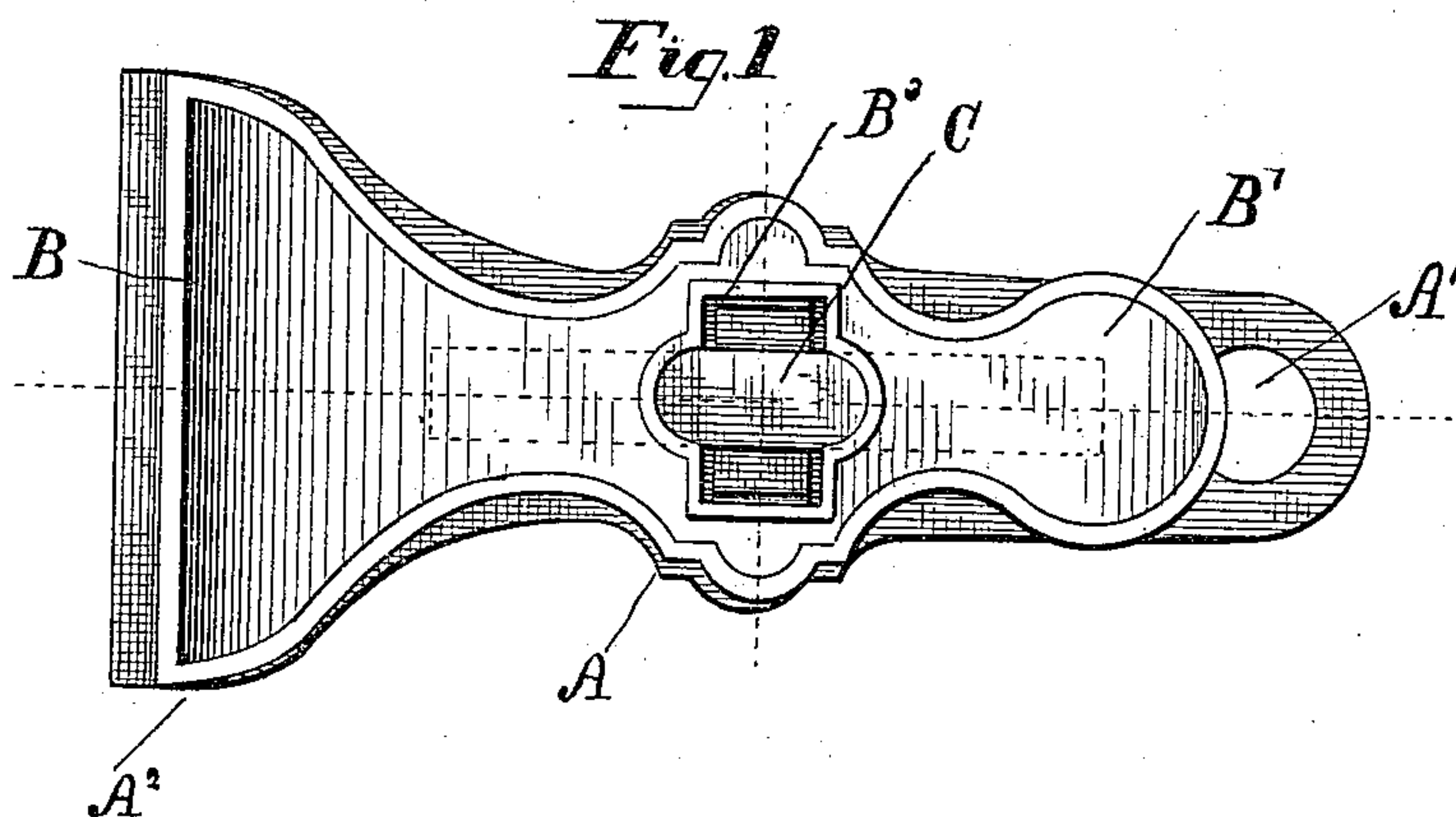


(No Model.)

I. W. HEYSINGER.  
SPRING CLAMPING DEVICE.

No. 334,016.

Patented Jan. 12, 1886.



WITNESSES:

*John W. Lee*  
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INVENTOR

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# UNITED STATES PATENT OFFICE.

ISAAC W. HEYSINGER, OF PHILADELPHIA, PENNSYLVANIA.

## SPRING CLAMPING DEVICE.

SPECIFICATION forming part of Letters Patent No. 334,016, dated January 12, 1886.

Application filed September 26, 1885. Serial No. 178,237. (No model.)

*To all whom it may concern:*

Be it known that I, ISAAC W. HEYSINGER, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Spring Clamping Devices, of which the following is a full, clear, and exact description, reference being had to the drawings accompanying and forming a part of this specification, in which—

Figure 1 is a plan view, from above, of a spring paper or other clamping device embodying my invention. Fig. 2 is a longitudinal vertical section upon the dotted line shown in Fig. 1. Figs. 3, 4, and 5 show different forms of a transverse vertical section upon the dotted cross-line of Fig. 1; and Fig. 6 is a sectional view of a part of the base broken off, and showing the manner of seating the one end of the spring C in the shoulder A<sup>7</sup> A<sup>8</sup> of the base.

The lettering in all the figures is uniform.

My invention relates to the construction and adaptation of the parts of a spring clamping or analogous device, in which a spring-actuated jaw is pivoted upon a supporting-base in such manner that when the clamping jaw or lever is lifted up from the base and then suddenly released it will be driven down with sudden impact upon the opposite jaw or base, and in which the various parts are more cheaply constructed and more easily put together or taken apart, in which worn parts may be more readily replaced, and in which the whole construction is more simple and effective in operation than in those devices for similar purposes heretofore in use.

It is particularly well adapted for use in spring paper-clips, as shown in Fig. 1 of the drawings, but is also applicable to the construction of spring clothes-pins, clamps, holders of various kinds, or for the hammer mechanism of toy or other guns and pistols, or wherever two jaws are pivoted together and operate by means of a spring-snap action to close upon each other when separated and then released.

Referring to the drawings, in Fig. 2 is shown in section the general construction of the device. The base A consists of a flat plate, adapted, when used as a paper-clip, to stand upon a desk or table, and having at its rear end

an opening, A', by means of which the device may be suspended upon a nail. The form of this base is varied according to the requirements of the device in which it is to be employed. At its forward end the base A is expanded to form a broad, flat support, A<sup>2</sup>, for the lip of the clamp B above. The base A is provided with a longitudinal central slot, as shown in Fig. 2, the said slot being provided at its ends with shoulders A<sup>5</sup> A<sup>5</sup>, presenting downward and having stops or studs A<sup>7</sup>, Figs. 2 and 6, to prevent the escape of the ends of the spring C when the same is in place, the said spring C occupying the said slot in the base, the ends thereof being supported against upward pressure by the said shoulders A<sup>5</sup> A<sup>5</sup>. The middle portion of this spring-slot in the base A is crossed by a bridge, A<sup>3</sup>, of the form shown in Fig. 2, the said bridge having its upper surface beneath the general level of the top surface of the base A, and being provided in its rear portion with a transverse groove, A<sup>4</sup>, preferably rounded at its bottom and opening upward, in which said groove rocks or partially rotates the roll or bead B<sup>6</sup> of the clamping arm or jaw B. The forward edge of the bridge is chamfered off or depressed, as shown, to avoid contact with the under surface of the strap B<sup>4</sup> B<sup>5</sup> of the vibrating jaw B. Instead of a transverse bridge, I sometimes, however, use simple notches or supports at the sides of the spring-slot, and dispense with the groove-and-bead joint; but I usually prefer to use the grooved bridge, as being simpler, safer, stronger, and better.

The clamping-lever B consists of an elongated plate provided at its rear end with a thumb-lever, B'—although this may be dispensed with in certain forms of the device—and with a clamping-lip at its forward end, preferably curved downward, which is matched against the broad face A<sup>2</sup> of the base A. At its middle part the clamping-lever B is provided with a downwardly-extending loop or strap of metal, B<sup>4</sup> B<sup>5</sup>, of the form shown in Fig. 3, substantially, having inwardly-inclined sides B<sup>4</sup> B<sup>4</sup>, which may be vertical unless made of cast metal, and a flat bottom or connecting piece, B<sup>5</sup>, the said loop or strap being open through from front to rear.

In order to permit the part B to be readily



cast entire in metal, I provide the lever-plate B, just above the downwardly-projecting strap or loop B<sup>4</sup> B<sup>5</sup>, with an opening, B<sup>3</sup>, from the sides of which the side pieces of the loop or strap are drafted for casting, so that the whole part will readily draw from the sand or mold, and is made without the use of a core, a three-part flask, or other expensive devices. Across the under side of the horizontal bottom part, B<sup>5</sup>, of this strap B<sup>4</sup>, Figs. 3, 4, and 5, is formed at the rear side or edge a roll or bead, B<sup>6</sup>, which seats itself in the groove A<sup>4</sup>, so as to form a center or pivot of partial rotation. In front of this pivot the upper side of the horizontal part B<sup>5</sup> of the strap B<sup>4</sup> is slightly raised, so as to form a supporting edge or rib for the spring C, and the lower side of B<sup>5</sup> and the upper side of A<sup>3</sup> (see Fig. 2) are separated from each other at their front edges, to permit the clamping-lever B to descend without interference. I sometimes raise a bead upon the upper side of the front edge of the part B<sup>5</sup>, to insure a stronger tension of the spring C as it bears upon the said part; but usually this is not required.

The parts A and B having thus been described, their operation will be readily understood. The clamping-lever B is placed upon the base A so that the bead B<sup>6</sup> rests in the groove A<sup>4</sup>, the lip of the lever B extending over and resting upon the front A<sup>2</sup> of the base A. The spring C, which is a simple bar of spring-tempered steel of suitable width and length, is passed up through the spring-slot in the base A, then over the bridge A<sup>3</sup> and the superimposed horizontal part of the strap or loop B<sup>4</sup> B<sup>5</sup>, and then strongly bent down at the end and thrust under the opposite shoulder until the rear end of the spring slips over the rear stud or stop, A<sup>7</sup>, and is securely seated beneath the shoulders, the middle part being bowed upward and straining down upon the horizontal part B<sup>5</sup> of the strap B<sup>4</sup>, through which from front to rear it passes. The tension of the spring C draws down the forward edge of the strap B<sup>5</sup>, and with it the lip of B, which is firmly clamped against the front part of the base A<sup>2</sup>. When the thumb-lever B' is depressed, the bead B<sup>6</sup> will partially rotate in the groove A<sup>4</sup>, the front edge of B<sup>5</sup> will be lifted, carrying with it, under pressure, the middle portion of the spring C, the ends of which are confined beneath the shoulders A<sup>5</sup> A<sup>5</sup>. The front end of the spring, as the spring becomes more convex, will draw over the edge of the shoulder A<sup>5</sup> without escaping therefrom, and as soon as the thumb-lever B' is released the spring will suddenly close the jaws and securely clamp them together.

To take the device apart, the end of the spring C is forced down away from the shoulder A<sup>5</sup> until it clears the stop A<sup>7</sup>, when it may be readily pushed out endwise, when the whole device separates into its constituent elements.

When an accurate fit is desired along the clamping-lip at A<sup>2</sup>, I sometimes form the lower surface of the part B<sup>5</sup> and the upper

surface of the part A<sup>3</sup> in a curved form, as shown in Fig. 5, leaving sufficient play at the sides, and thus as the convex bead is slipped from side to side along the concave groove the horizontal fit of the clamping-lip at A<sup>2</sup> will vary upon the base. For paper-clips, however, I prefer to use the automatic adjustment shown in Fig. 3, where the convex bead rests in a horizontal groove, so that the spring acting upon the top surface of B<sup>5</sup> will be able to rock it slightly from side to side, so that if one corner of the clamping-lip reaches the base A<sup>2</sup> before the other the adjustability of the bearing under the tension of the spring C will bring both sides of the clamping-lip down to place.

While I prefer to make my clamping-lever B of cast metal, for which purpose I form the opening B<sup>3</sup> in the top surface thereof, I sometimes cast or stamp that plate solid, or form it of wood or other material without the opening B<sup>3</sup>, and attach the strap or loop B<sup>4</sup> B<sup>5</sup> by means of rivets or screws, or form the whole device in other analogous ways, according to the special purposes for which the invention is to be used.

It will be readily seen that the simplicity, strength, and ease of operation, and also the facility of putting together and taking apart, render this invention useful for a variety of purposes, as any required strength of spring may be secured by doubling or trebling the spring-plates upon each other, or using light or heavy springs, as may be desired at any time.

I apply my invention to clamps and snaps of all sorts, to locks—such as door-locks—hasps of gates, clamps for paper-fastening tools, music-holders, book-holders, clothes-pins, card-clips, hammers for fire-arms, toy guns, and anywhere where a simple, cheap, and effective spring clamp or snap of the general construction shown may be desired.

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

1. The combination of a base provided with a central longitudinal spring-slot having shoulders formed beneath the ends thereof, and a transverse bridge or pivot support along the length thereof, with a vibrating clamping lever or jaw pivoted upon said support, provided with a top plate having a downwardly-extended strap or loop open from front to rear, to permit the passage of a bar-spring, together with a bar-spring supported upwardly at the ends against the shoulders at the ends of the said spring-slot, and impinging at its middle part upon the horizontal portion of the said strap or loop, whereby its pressure upon the edge of said horizontal portion of said strap will bring the clamping-lip down upon the base, substantially as described.

2. In a spring paper-clip, the combination of the base A, provided with a clamp-supporting extension, A<sup>2</sup>, a longitudinal spring space or slot extending along the said base and having terminal spring-supporting shoulders



A<sup>5</sup> A<sup>5</sup>, a central pivot-support, A<sup>3</sup>, provided with a transverse pivot groove or seat, A<sup>4</sup>, with the vibrating lever B, provided with a clamping-lip adapted to impinge against said extension A<sup>2</sup>, and a downwardly-extended strap, B<sup>4</sup> B<sup>5</sup>, open from front to rear, and cast or otherwise formed integral with the said clamping-lever B, and provided with a pivot adapted to engage in said pivot-support A<sup>4</sup> and form a pivot-joint therewith, the whole being held in place by the elongated detachable spring C, engaged at its ends under the shoulders A<sup>5</sup> A<sup>5</sup>, and passing, under tension, through the strap B<sup>4</sup> B<sup>5</sup>, and impinging upon the lower or horizontal portion thereof, substantially as described.

3. In a clip or clamp, in combination with the base A, spring C, and pivoted clamping-lever

B, the bearing B<sup>6</sup> A<sup>4</sup>, having the lower surface of B<sup>6</sup> convex from side to side, so that the spring C shall tend to bring the clamping-lip down upon the base A<sup>2</sup> with a close fit from side to side, substantially as described.

4. In a clip or clamp, in combination with the base A, spring C, and pivoted clamping-lever B, the bearing B<sup>6</sup> A<sup>4</sup>, Fig. 5, having the lower surface of B<sup>6</sup> and the upper surface of A<sup>4</sup> convex and concave, respectively, so that when one or the other is moved from side to side it will vary or adjust the fit of the clamping-jaws, substantially as described.

ISAAC W. HEYSINGER.

Witnesses:

J. L. HEYSINGER,  
M. B. FENNINGER.