

No. 704,207.

Patented July 8, 1902.

C. J. PILLING & G. T. BARBER.  
HINGE FOR SURGICAL INSTRUMENTS.

(Application filed Jan. 9, 1902.)

(No Model.)

Fig. 1.

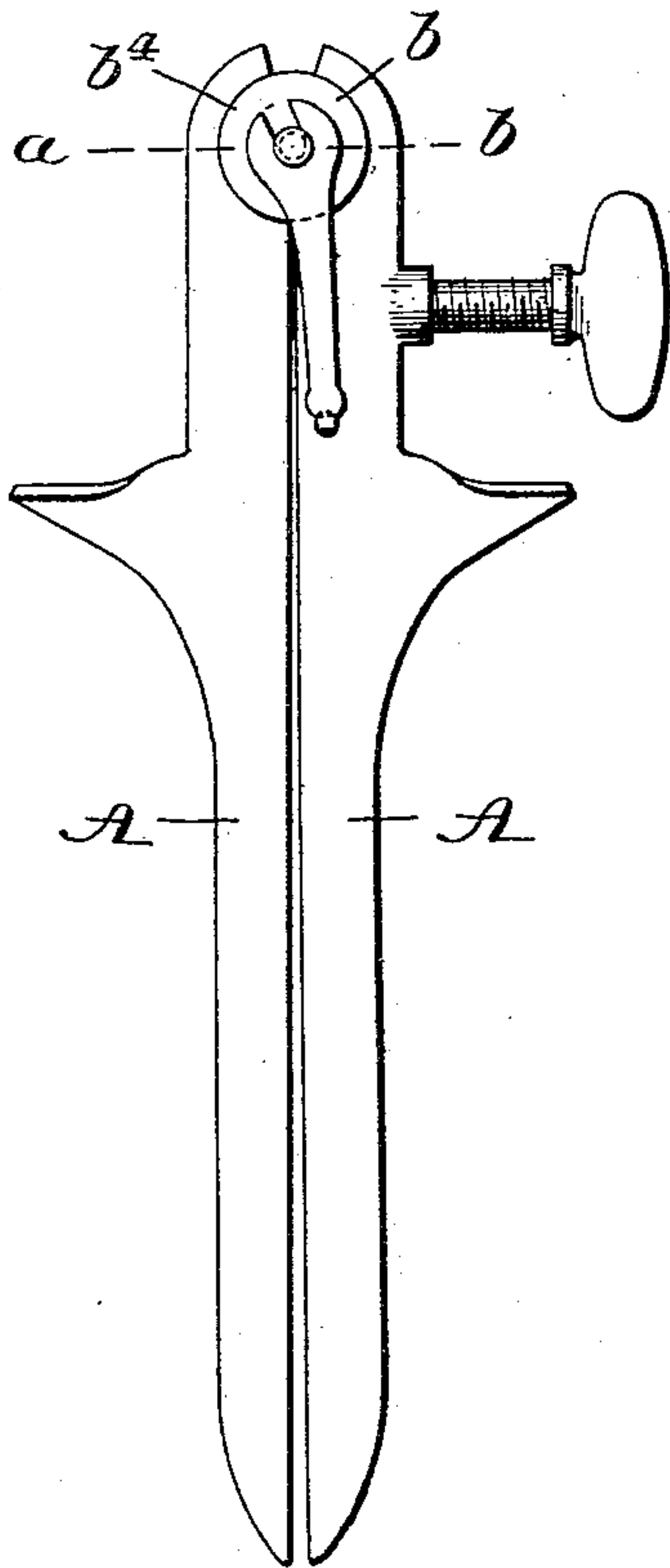


Fig. 2.

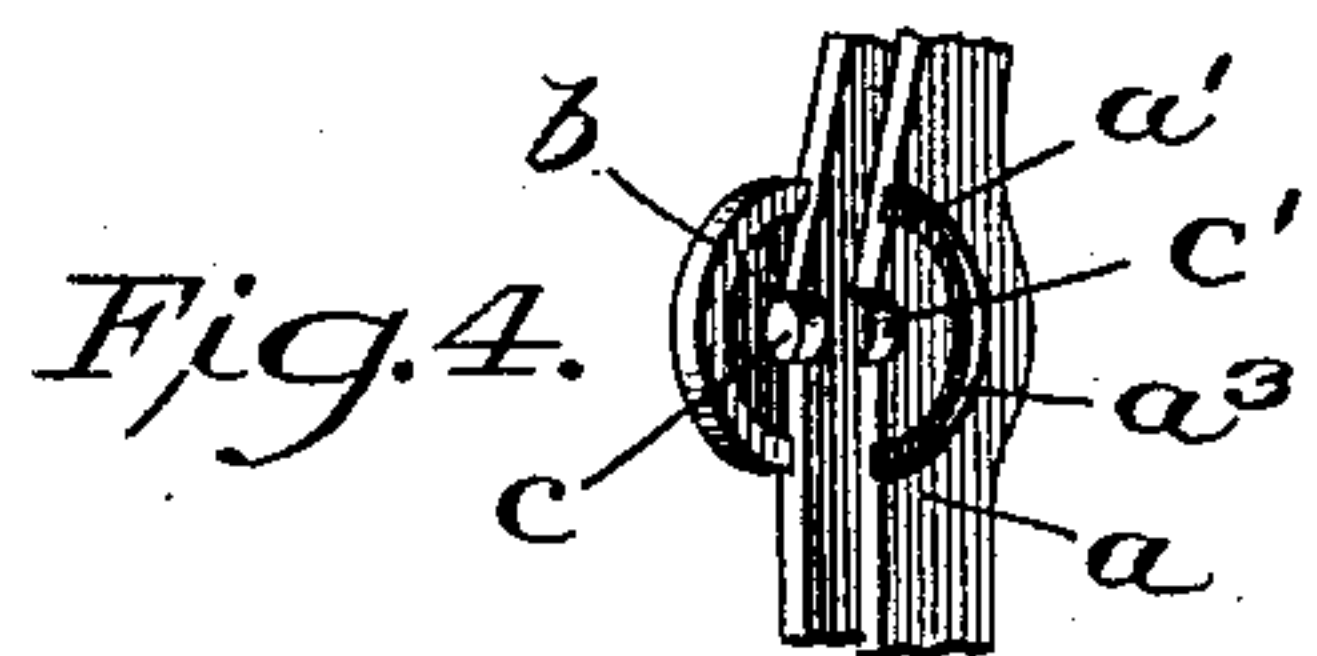
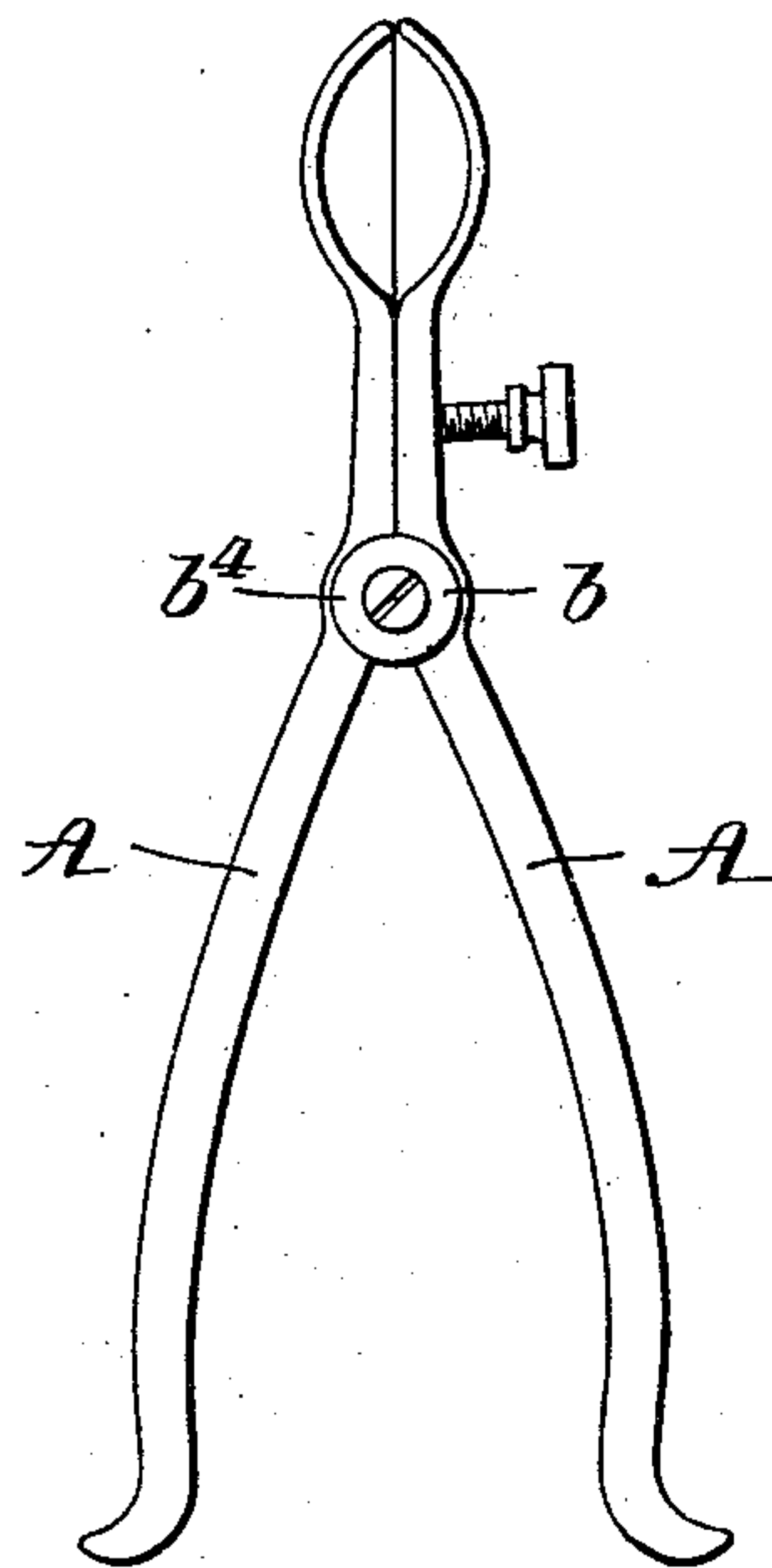


Fig. 5.

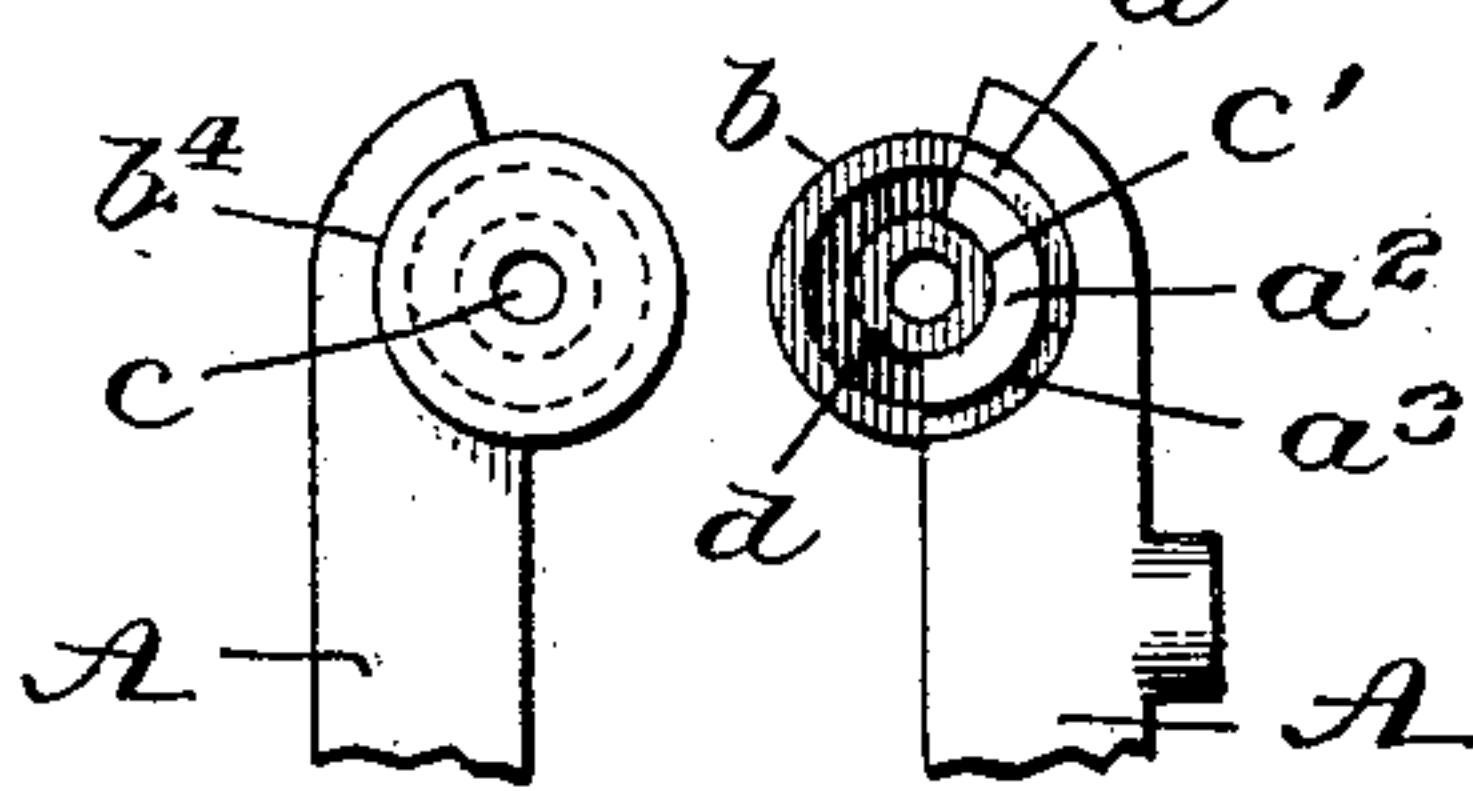


Fig. 3.

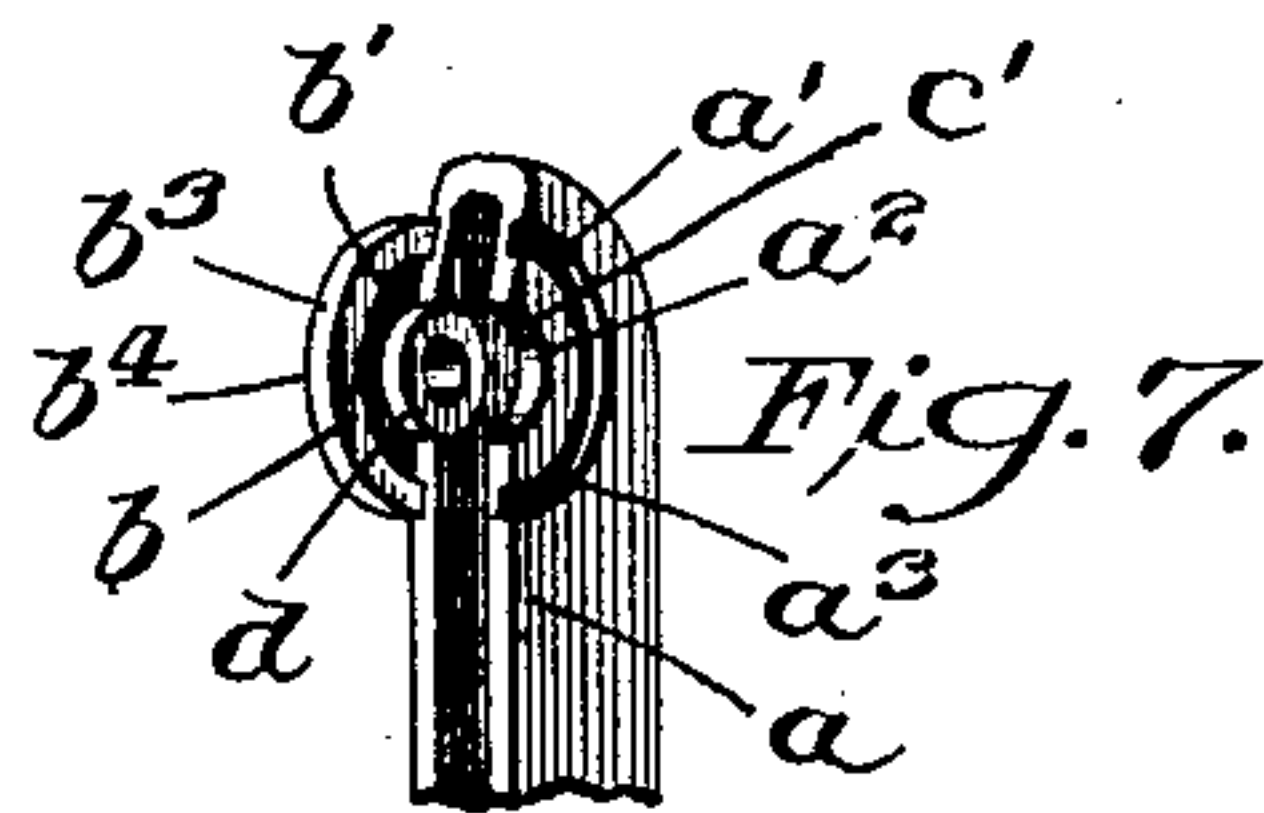
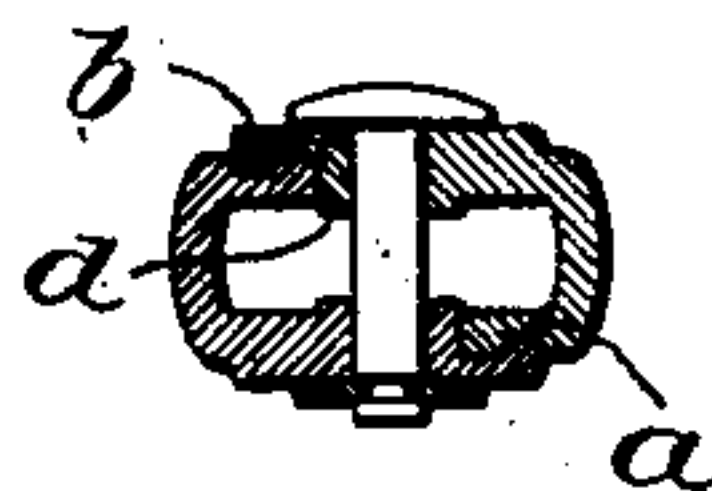
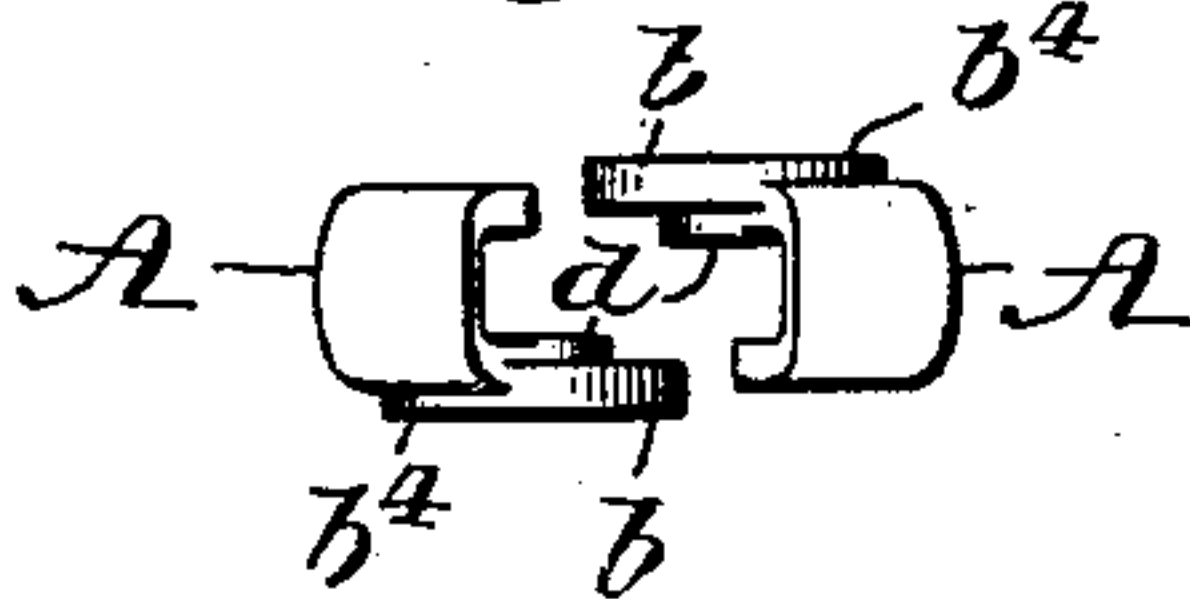


Fig. 6.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## HINGE FOR SURGICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 704,207, dated July 8, 1902.

Application filed January 9, 1902. Serial No. 88,960. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES J. PILLING and GEORGE T. BARBER, citizens of the United States, residing in the city of Philadelphia, State of Pennsylvania, have jointly invented certain new and useful Improvements in Hinges for Surgical and other Instruments Having Movable Blades or Members, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates to hinges for surgical and other like instruments having two members or blades movable relatively to each other in the same plane; and the object of the invention is to prevent wobbling of the blade members upon their pivotal hinge connection out of the normal plane of movement, due to looseness commonly resulting from ordinary wear of the parts or defective construction of the pivotal connection.

Our device is constructed on the principle of providing each section of the hinge with two opposite supporting and guiding means adapted to register with like means on the opposite hinge-section arranged in reverse order, so that each section will have two opposite bearing-surfaces arranged in parallel planes instead of being singly supported, as usual in hinges, in the plane of its opening and closing movement, each section of the hinge being so supported by the opposite section when held in normal coincidence by a pivot-pin or like means. One embodiment of that principle is exemplified in the device invented by us and patented by Letters Patent No. 641,036, dated January 9, 1900, and our present invention is another and specific embodiment of the same principle in hinge construction for instruments of the character referred to.

In the accompanying drawings, illustrating our invention, Figure 1 is an elevation of a two-bladed device to which our hinge is applied at the extreme end. Fig. 2 is a like view in which the hinge is shown midway of the instrument between the blade ends and the operating-handle instead of at the end.

Fig. 3 is a section on the line *a b* of Fig. 1. Fig. 4 is an elevation of one of the hinge members of Fig. 2. Fig. 5 is a front elevation of the two like hinge-sections separated. Fig. 6 is a top or plan view of the hinge-sections, as shown in Fig. 5; and Fig. 7 is a perspective elevation of one of the hinge-sections.

In most two-bladed hinged instruments of this class it is desirable to make the blades of stamped-up sheet metal, and by this method we give an interior longitudinal concavity to the blade, thus forming a channel in the blade member, and in our former embodiment of our principle of hinge construction, as described in our said former patent, we utilized this channel to obtain a double bearing on each wall of the channel for each member of the hinge, thereby providing four lateral bearings. In our present embodiment of the principle we may omit the channel or groove in the blade, though preferring to use it, and we provide each blade with like hinge members in reverse order on the two, in which each member of the hinge will have two opposite bearings arranged in parallel planes and registering with like hinge members in reverse position on the opposite blade.

Referring now to the drawings, *A A* in each of the Figs. 1 and 2 represent the blade members of a two-bladed surgical instrument which are required to be pivotally connected by a hinge device, the utility of such instruments being largely dependent on having their operating-blades opening and closing in perfect alinement and register.

Referring now to Fig. 7, the end of the blade member *A* has one wall *a* (if channeled) or one side *a* (if not channeled) provided with a semicircular recess *a'*, adapted in size and conformation to receive a semicircular projection *b* on the opposite side or wall of the same member *A*. The face of this recess *a'* is provided with a circular bead *a''*, thereby forming a circular groove *a'''*. The inner face of the semicircular projection *b* is reamed down to form an inwardly-facing flange or rim *b''*. This rim-flange *b''* will rest and rotate in the semicircular groove *a'''*, formed by the bead *a''* on the face of the op-



posite recess  $a'$  in the opposite hinge member A. The semicircular projection  $b$  is preferably provided by soldering a disk  $b^4$  on the outer side of one wall or side of the blade member, with about half of the disk projecting above the horizontal plane of the blade member. A pivot-pin hole  $c$  is bored through the semicircular projection  $b$ , and, as shown in the drawings, we prefer to bore this hole in the center of the disk  $b^4$ , and this naturally brings half the pin-hole below the horizontal plane of the blade member, and hence a semicylindrical groove  $c'$  is cut in the horizontal face of the blade member or in the opposite walls if the blade member be channeled. When the opposite blade members are assembled, they would as far as the hinge has been described pivotally swing solely on the pivot-pin. We prefer, however, to have the members additionally guided in their opening and closing movements on the hinge-pin, and to that end we provide a circular rim or flange  $d$  on the inner recessed face of the disk  $b^4$ , which rim or flange encircles the pivot-pin hole in the disk, in consequence whereof we cut away a semicircular recess  $a^2$  on the face of the recess  $a'$ , which then rotates on this rim or flange  $d$  as a bearing and strengthens and supports the hinge-sections proper, while at the same time providing an opening  $c'$  in that side of the hinge member, through which the necessary pivot-pin may pass. The provision of a disk  $b^4$ , soldered to the outside of one wall or side of the hinge member, whereby to provide the semicircular projection  $b$ , has this advantage—that when the members are assembled the two disks are on opposite sides of the complete hinge, the pivot-pin passing through the center of each disk and no other part of the hinge mechanism is apparent, the disks thus having externally the appearance of mere washers for the pivot-pin.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination in an instrument composed of two blade members, of a pivotally-connecting hinge between them, each hinge-section having on one wall a semicircular recess, and on the opposite wall a semicircular projection with a rim or flange to fit within

said recess, the two members being so constructed in reverse position relatively, a lateral opening in said projection on each member, and a pivot-pin passing through said opening and operating to maintain the parts in register.

2. The combination in an instrument composed of two blade members, of a pivotally-connecting hinge between them, each section of which has two separate bearing-surfaces lying in parallel planes, said sections being formed with a semicircular groove and within the same a semicircular rim on the exterior of one wall thereof and a semicircular projection with an outer flange edge or rim and an interior concentric rim or edge on the opposite wall, arranged in reverse order on the two hinge-sections, the flanges and grooves on each registering with those in the other hinge-section when said parts are assembled, and a pivoting device adapted to fit a centrally-bored opening passing through said semicircular projection and grooved wall, and adapted to maintain the parts in register.

3. The combination in an instrument having two blade members each having a channeled portion forming opposite walls, a disk with a rim or flange on its inner face, secured on the exterior of one of said walls, and a semicircular groove on the exterior of the opposite wall, said blade members being provided with said recess and projection on reverse walls of each and assembled and combined in such manner that the rim or flange of the projection of each blade member will enter and rotate in the semicircular groove of the other, whereby each section of the hinge will have two independent bearing-surfaces in parallel planes; a central opening in said disk and like semicircular openings in the two opposite walls in line with said disk-opening, and a pivot-pin adapted to enter said openings and maintain the parts in position.

In testimony whereof we have hereunto affixed our signatures this 7th day of January, A. D. 1902.

CHARLES J. PILLING.  
GEORGE T. BARBER.

Witnesses:

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