



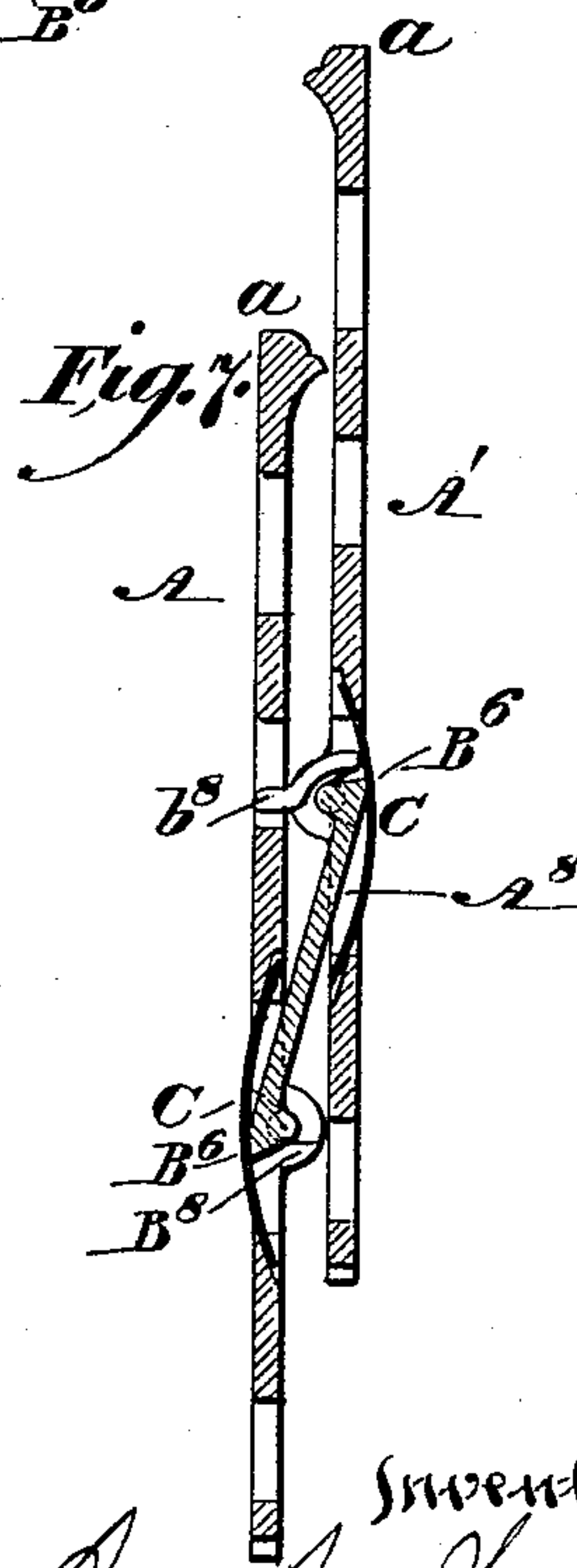
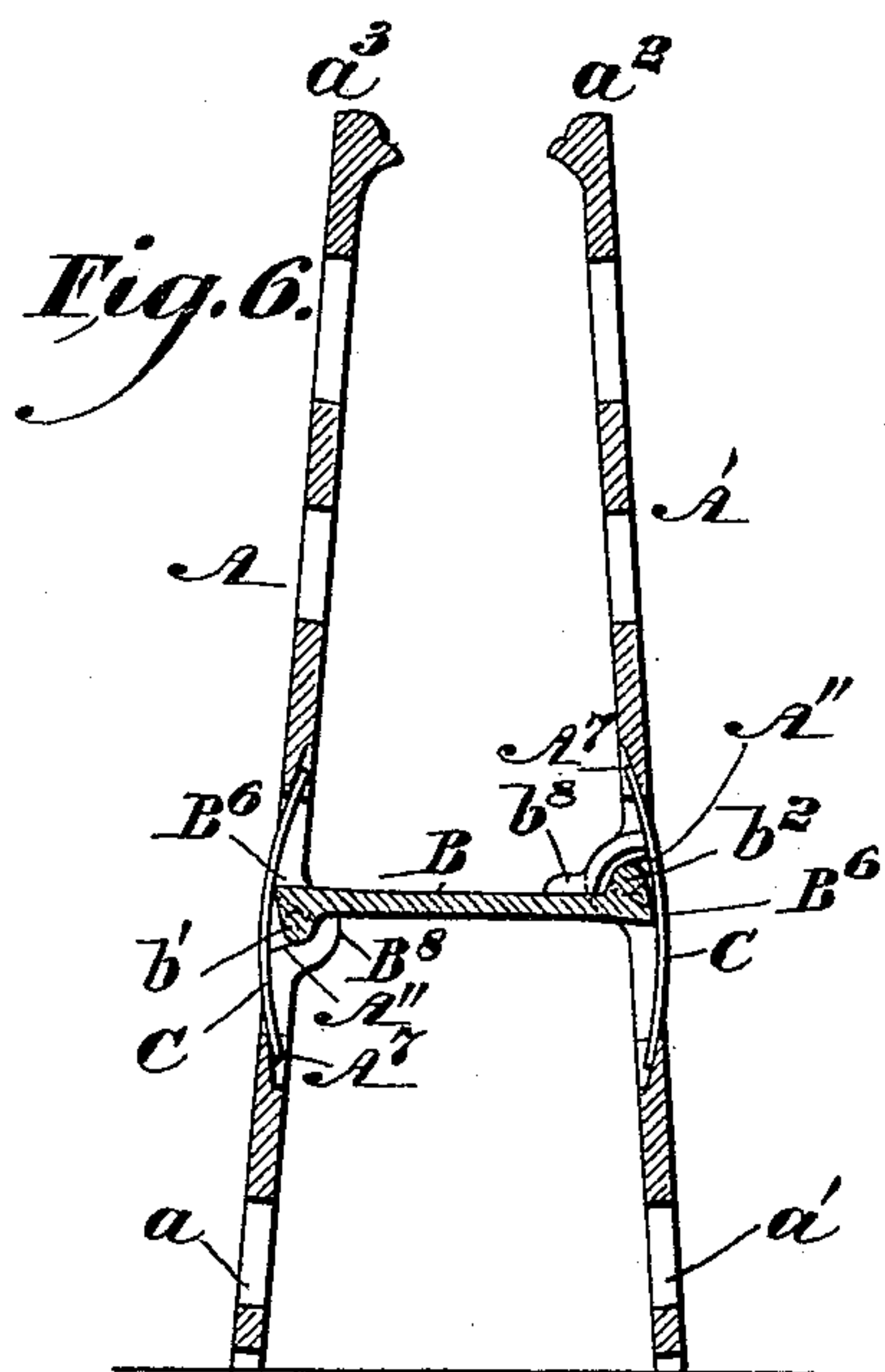
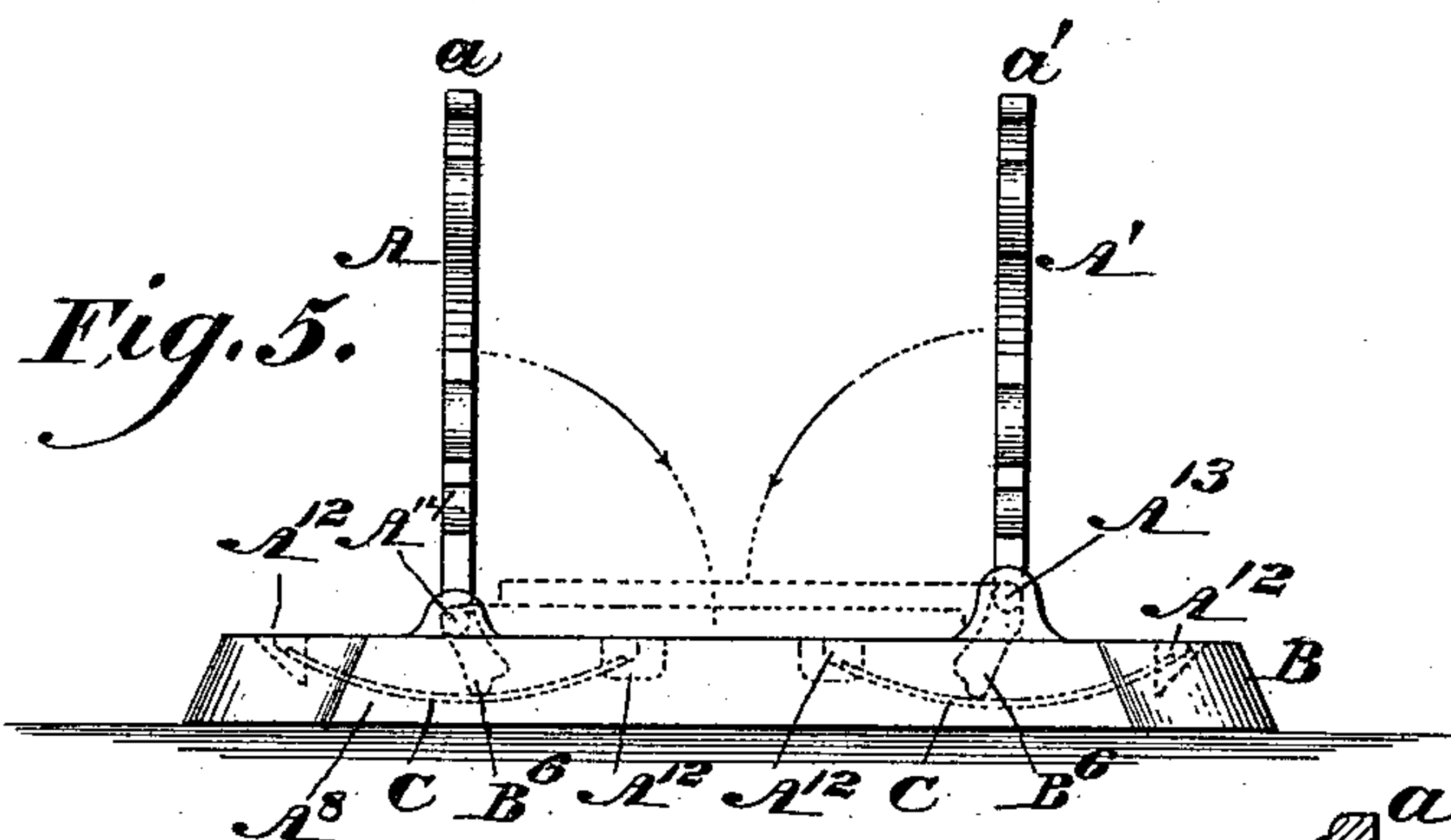
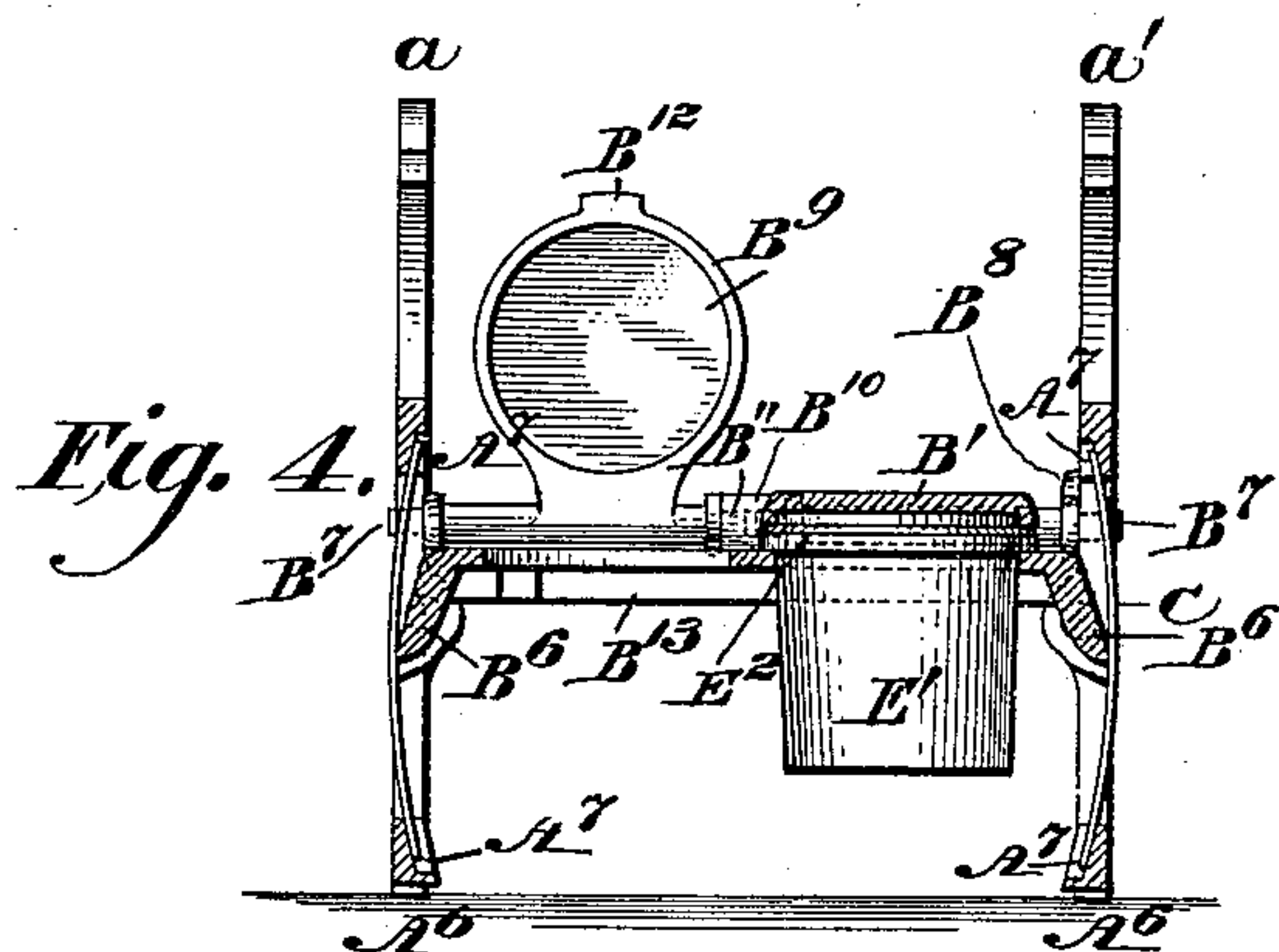
(No Model.)

2 Sheets—Sheet 2.

I. W. HEYSINGER.  
SPRING FOLDING RACK.

No. 463,680.

Patented Nov. 24, 1891.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## SPRING FOLDING RACK.

SPECIFICATION forming part of Letters Patent No. 463,680, dated November 24, 1891.

Application filed September 4, 1891. Serial No. 404,734. (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 made a certain new and useful Improvement in Spring Folding Racks, of which the following is a full, clear, and exact description, reference being had to the drawings which accompany and form a part of this specification, in which—

Figure 1 is a perspective view of a spring folding pen-rack embodying my invention, showing the same erected for use with the hinged cover of the receptacle open. Fig. 2 is a front view of the same folded for shipment or when out of use, the hinged cover closed and resting upon the top of its box or receptacle. Fig. 3 is a perspective view, similar to Fig. 1, of a pen-rack embodying my invention, erected for use and with the central receptacle adapted to and holding in place two ink-wells with their hinged covers closed. Fig. 4 is a vertical transverse section through Fig. 3, showing one ink-well removed and exhibiting the construction of the parts in more detail. Fig. 5 is a front view, with dotted sectional outline, of a spring folding rack embodying in its construction my invention in part and adapted to hold an inkstand, books, or the like, the central cross-support formed in this figure at the bottom and resting upon the desk or table. Fig. 6 is a vertical transverse section of a spring folding rack embodying my invention in part and constructed and adapted to form a spring folding easel for the table, mantel, or the like, having projecting supports *a a'*, upon which photographs, pens, or other objects may rest; and Fig. 7 is a similar view to Fig. 6, showing said easel folded for transportation, or when not in use the folding of the two sides in Figs. 6 and 7 being somewhat different from those shown in Figs. 1 and 2 in direction, but not in principle.

The lettering in all the figures is uniform.

The object of my invention is to produce a folding rack adapted for use upon desks, tables, or the like, having two sides and a central cross-support, and when in use occupying considerable space, so as to have spread enough to support upon its two sides pens, pencils, rolls of paper, photographs, or the

like, and which shall be so constructed that the whole is maintained in an open or expanded position for use by means of the impingement of the bearings or joints against the pressure of springs permanently in place, and which can be folded up against said spring-pressure, substantially in the manner of the blades and handle of a double-ended pocket-knife, so as to occupy a comparatively small space and the whole be rendered safe for transportation or put out of the way when not in use, while it may be instantaneously opened or expanded to its full size and held so opened or expanded by the pressure of said springs against the joints or knuckles of the adjacent bearings.

Another object of my invention is to provide such springs and bearings constructed to interlock with each other, so that the said springs hold the said bearings in place without the use of pins, screws, rivets, or other means of attachment and without the labor and expense attendant upon fitting the said rack up with such rivet or screw-joints, in my invention the bearings being made with open journal-boxes, and the springs holding the journals therein by pressure from the open side of said journal-boxes, thus making a cheap, simple, and durable construction detachable at will.

Another object of my invention is to construct a folding rack for pens and other purposes, portable in character and adapted to rest upon a desk or table, in which the bearings or joints and the attachments of the side pieces to the central cross piece or support are made by flexible springs, so that a sudden blow or a fall upon the floor will permit the strain and shock to be taken by the yielding springs instead of by rigid rivets, screws, or other joints, greatly lessening liability of breakage, the said racks instantly restored by the tension of the said springs against the said joints or the knuckles adjacent thereto and impinging against said springs.

My invention consists in the construction of a portable rack adapted to support pens, erasers, or the other paraphernalia of an office-desk, or which may be adapted to hold other objects, such as photographs, ink-wells, or the like, said rack having two side pieces adapted to stand erect upon a desk or table,



or substantially so, and connected laterally with each other by a cross-piece attached to and adapted to support the said side pieces and maintain them in proper position for use. These side pieces along the front margin or along both front and rear I provide when for use as a pen-rack with suitable notches or hooks, upon which pen-holders, &c., are adapted to be supported, extending across from one side piece to the other. The attachments of the side pieces to the cross-piece I form by a spring-bearing, the cross-piece being socketed into the upright side pieces at each end, so as to make a pivot-joint, and adjacent to each of these pivot-joints I provide a knuckle or heel, which impinges against the tension of the spring and tends to restore the parts to their proper position if the sides are moved upon the cross-piece at their mutual bearings. To prevent the side pieces from passing beyond the vertical, I provide stops or lugs, so that the motion of rotation of the side pieces upon their bearings on the cross-pieces will be arrested by impingement upon said stops. These springs, stops, lugs, and knuckles I apply adjacent to the joints upon either the cross-piece or the side pieces, as may be preferred, the operation in one case being similar to that in the other, as may be seen.

My invention further consists in forming my side pieces with open journal-boxes and my cross-piece with projecting pins, (or the reverse,) said pins adapted to enter said open journal-boxes and form a horizontal bearing therein, and attaching my springs at the opposite sides in such manner that they will press upon the said journals or the lugs and stops attached thereto, and not only form a secure knuckle-joint but also hold the pins of the bearing firmly in place in the journal-boxes, so that no pins, screws, or rivets may be required in addition, the removal of the springs permitting the whole to be taken apart at once.

My invention further consists in providing my cross-piece, in a construction such as is above described, with a receptacle, which I prefer to cover with a hinged lid, and this hinged lid I form with end pins in rear adapted to enter corresponding holes in the side pieces, so that the lid is detached when the side pieces are folded down and hinged in place by the mere erection of the side pieces into place for use. This receptacle I use for small articles—pens, pencil-points, erasing-rubbers, or the like; and sometimes I pierce this cross-piece vertically with one or more openings and rest therein detachable ink-wells, one or more, the hinged cover constructed in a similar manner, either single or double, as one or more ink-wells may be employed. In such cases I prefer to place the cross-piece midway or part way along the vertical height of the side pieces, the ink-wells supported by flanges at their upper margin and projecting downward through the cross-

piece; but I sometimes, also, form the cross-piece as a base to rest upon the table and hinge the vertical side pieces thereto; and while I usually make the vertical side pieces fold over toward each other below, which makes a very compact construction when folded, I do not always do so; but sometimes prefer, for obvious reasons, to fold them inward above, as when the cross-piece serves as a base, or to make one joint fold upward and the other downward, as in easels, or where the side pieces are too long to fit into the length of the space occupied by the cross-piece.

The spring which I prefer to use is a simple flat piece of spring-steel, supported at both ends in a socket or recess, and extending in the arc of a circle around and behind the bearing, and impinging against a knuckle or heel of the cross-piece, or vice versa. In this case the rack when folded up has no tendency to spring back, the heel or knuckle passing under the fulcrum, as in the blades of an ordinary pocket-knife, above referred to as an illustration. A spring supported at one end only by a clamp will answer; but it has not the firmness desirable to hold the rack secure when open for use. A coiled spring may be used also, but it is not so durable, and would require a catch to hold the sides in place, either when closed or open. In the constructions which I illustrate in the figures I use the simplest means and produce the best results.

Referring to the drawings, in Fig. 1 I show a pen-rack in position for use. A and A' are two vertical side pieces, having feet A<sup>6</sup> A<sup>6</sup>, adapted to rest upon a desk or table. The side pieces A and A' are made preferably of cast-iron, though they may be stamped out of sheet metal, if preferred, and are made in open-work and suitably decorated for the sake of lightness and appearance. An opening, in the form of an oval space in Fig. 1 and of a square in Fig. 3, is formed in each side piece A and A', upon the inner sides of which, above and below, is a shouldered recess A<sup>7</sup>, Figs 1 and 2, which form internal seats for the ends of the flat plate spring C, which consists of a single strip of flat steel, which may be of a half inch in width and of a gage from No. 21 upward or downward. In the sides of the space A<sup>8</sup> are formed open journal-boxes A<sup>11</sup> A<sup>11</sup>, opening outwardly and having semi-cylindrical bearings at the bottom thereof, in which are seated, so as to freely rotate, the pins B<sup>3</sup> B<sup>3</sup>, which are integral with the cross-piece B, which supports the side pieces A A'. This may be a simple cross-bar, with the pin-bearings B<sup>3</sup> B<sup>3</sup> at its opposite ends; but I prefer utilizing its length by forming it into a receptacle, as shown, and which forms a useful appendage to the rack itself. This box, open above, extends across from A to A', the journals B<sup>3</sup> B<sup>3</sup> projecting outward and to the front and rear at each end thereof. By reason of the oval form of the space A<sup>8</sup> the end



of the box B, with its journals, may be passed when turned at a suitable angle through the said oval, and when brought into a horizontal the journals  $B^3 B^3$  will enter the journal-boxes  $A^{11} A^{11}$  and form a pivoted bearing therein. The spring C is now inserted from above or below and from the inside of the oval  $A^8$  outwardly, and bent in a spring-arch over the end of the box B and forced inward through the oval until the two ends of the spring C are seated in the shouldered sockets  $A^{11} A^{11}$ . The pressure of the spring against the box B at the ends thereof will securely hold the journals  $B^3 B^3$  in their sockets during partial rotation of the said side pieces A A' upon the cross-piece B. The said cross-piece B is formed with a downwardly and outwardly projecting heel  $B^6$ , (shown clearly in Fig. 2,) and the spring C bears directly against this heel, tending to strongly bring the tops of the side pieces A and A' toward each other. Upon the ends of the box B and the adjacent faces of the side pieces A A' is a stop  $B^8$ , above the pivoted bearing  $B^3$ , so that the side pieces A A', engaging against these stops  $B^8 B^8$ , will be stopped in a vertical position and held securely by the pressure of the arched spring C. When the lower portions of the side pieces are brought toward each other, the spring C will strongly resist; but as the heel  $B^6$  passes along the face of the spring C it will gradually approach a position beneath the fulcrum, and the resistance will diminish until, when brought into the position shown in Fig. 2, the bearing of the heel upon the spring will be substantially vertical and the rack will remain in its folded position until restored by hand, when the force of the springs will gradually increase until the side pieces come into their vertical position with a sudden snap.

It will be seen that the spring acts most powerfully to prevent displacement, which is just where the strongest resistance is required. In the side pieces A and A' are seen two holes  $A^9 A^9$  above and in rear of the box B.

The box B is provided with a cover B', adapted to protect the contents thereof. This cover is provided near its ends with two dependent flanges  $b b$ , which enter the box B at the ends to prevent looseness and rattle, but which may be dispensed with if desired. The rear side of the cover B' extends in rear of the box B somewhat, and is provided with two pins  $B^7 B^7$ , extending longitudinally from the rear margin and formed integral with the cover B'. These pins are slightly smaller in diameter than the holes  $A^9 A^9$  in the side pieces. The rack being folded, as shown in Fig. 2, and the cover B' placed upon the box B, it will be held in place by the internal flanges  $b b$ , Fig. 1. When brought into the open position, as shown in Fig. 1, the holes  $A^9 A^9$  will follow the dotted curved lines of Fig. 2, and when the rack has been erected the cover B' will be found to have automatically hinged itself in place in the holes  $A^9 A^9$

and may be tipped upon its hinged bearings, as is shown (partially open) in Fig. 1. When tipped entirely back, it will remain open by gravity, and to limit the backward drop of said cover I provide stops or studs  $A^8 A^8$ , integral with the side pieces A and A', against which it will rest until tilted forward by the hand, when it will drop shut by its own weight.

Near the bottom of the rack upon one of the side pieces A, I form integral with the side piece, if preferred, an inwardly-projecting pin  $A^{10}$ , which may be an inch or less in length. Over this pin I draw a sleeve of india-rubber tubing or like soft substance grooved longitudinally outside and ornamental in character, if preferred, which tube I attach to the pin by a solution of shellac or other cement, so that it presents a soft flexible surface to the draw of a pen over it, and serves as a convenient and effective and very durable pen-wiper. When folded up, this pin projects in front of the box B, Fig. 2, and does not add appreciably to the bulk of the rack.

In Fig. 3 I have shown a simple modification of Fig. 1, consisting in forming the receptacle of the cross-piece of Fig. 1 into two small inkstands, which extend downward through perforations in the cross-bar B, the ink-wells E E' having flanges  $E^2$  around their upper margins, which extend beyond the perforations in the cross-piece B, (see Fig. 4,) so that the said ink-wells E and E' are securely suspended, but may be readily removed by folding the rack down, as in Fig. 2. The stops  $B^8 B^8$  extend above the cross-piece B, and in front I form an open dish  $B^{12}$ , conveniently placed for the reception of small objects. The covers B' and B' work independently, one cover for each ink-well, and have their outer pins  $B^7$  inserted in the holes  $A^9$ , just as in Fig. 1, but midway along B, in rear and along the line between  $A^9$  and  $A^9$ , is a raise  $B^{11}$ , cast open from beneath and with open ends, and into these open ends  $B^{11}$  are inserted the corresponding pins of the said covers. A single ink-well and a single cover may be used, if desired. The pen-rack hooks  $a$  and  $a'$  are removed along the front in Fig. 3, where they would interfere with the use of the ink-wells E and E', but are shown above and below the middle portion.

In Fig. 5 I form my cross-piece B at the bottom, and make it into a base-piece, and erect the side pieces A and A' thereupon. It will be seen that the pivoted bearing  $A^{13}$  is upon a slightly higher level than the opposite bearing  $A^{14}$ . The dotted lines show that when folded A' will overlap A from end to end and make a compact construction along the base, just as in the other figures, the operation of the springs, stops, heels, &c., being similar, the construction being varied somewhat, as shown in the figures. This form is particularly adapted to the use of heavily-weighted objects, as large inkstands, books,



or the like, the springs C C being in the base instead of the uprights. For general purposes, however, I prefer to use the forms shown in Figs. 1 and 3, and introduce this figure to more particularly illustrate the various applications of the invention.

Figs. 6 and 7 show a small parlor-easel. In this the arms are so long that they cannot be readily folded inward or outward, even by overlapping the same; but by reversing the stops and heels upon one side and reversing the pivoted bearing  $b'$  the bracket or easel will fold up, one side inward and the other outward, assuming, when folded, the position shown in Fig. 7. When open the stop  $B^8$  prevents the inward folding of the bottom of A, and the stop  $b^8$  the inward folding of the top of  $A'$ , the heels  $B^6 B^6$  acting upon the springs C C, precisely as in Fig. 1, and the springs also seated in the side pieces and operating in the same manner.

It will be observed that the easel shown in Fig. 6 is very compact when folded, and while in ordinary folding easels the leg behind folds up, the ornamentation of the front necessarily being upon the front face and concealed by the picture, in this the side pieces, as shown in Figs. 1 and 3, are constructed with their ornamentation in such position as to show in rear of the picture when viewed from the side, and present a very solid appearance. The easel also has much less tendency to tip backward or fold up than when supported by a pivoted crotch in the rear. At  $a$  and  $a'$ , Fig. 6, are two projecting prongs or hooks similar to those in Figs. 1 and 3, and adapted to support the photograph or picture; but these are not shown in Figs. 6 and 7, which are sectional views, the other figures illustrating the same very fully. If desired, two or more pairs of hooks or supports may be used at different heights, or sliding supports may be adapted to run along the side pieces, as desired.

I have fully described and illustrated the above figures; but I do not rigidly confine myself to the precise constructions shown and described, but modify my construction in various ways, as would be done by any skilled mechanic without departing from the principles of my invention, as herein shown, described, and claimed.

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

1. As an article of manufacture, a spring folding pen-rack consisting of two vertical side pieces adapted to stand upon a desk or table and a cross-piece attached to and supporting said side pieces, said cross-piece at the opposite ends thereof hinged to said side pieces by a pivoted bearing, and springs interposed at said hinged joints, acting upon said cross-piece and said side pieces and adapted by the tension of said springs to maintain the said side pieces in an erect position and to permit the said side pieces to be folded

down against the tension of said springs and along said cross-piece, substantially as and for the purposes described.

2. In a spring folding pen-rack, the side pieces A and  $A'$ , adapted to stand vertically upon a desk and provided with a series of hooks or notches  $a a a' a' a'$  along their margins, in combination with a cross-piece B, extended from one of said side pieces A to the opposite side piece  $A'$ , and jointed thereto at each end by a pivoted hinge-bearing, together with a spring interposed at each of said hinge-joints and acting by its tension against one of said side pieces and said cross-piece B, the whole constructed to operate substantially as and for the purposes set forth.

3. In combination with the vertical side pieces A  $A'$ , the transverse cross-piece B, having hinge-joints  $B^3 A^{11}$  at the attachments of said cross-piece to said side pieces, and springs C C, supported by said side pieces and bearing against lugs upon the ends of said cross-piece B, or conversely, and adapted to maintain said side pieces in a vertical position against the tension of said springs and to permit the said side pieces to be folded horizontally along the line of said cross-piece B upon their hinged bearings, substantially as and for the purposes described.

4. In a folding rack, the combination of vertical side pieces A  $A'$ , having bearings  $A^{11} A^{11}$ , the cross-piece B, having terminal hinge-pins  $B^3 B^3 B^3 B^3$ , adapted to said bearings  $A^{11}$ , the lugs  $B^6 B^6$ , socketed spring-supports  $A^7 A^7 A^7 A^7$ , and springs C C, the ends thereof supported in said sockets  $A^7$  and the centers thereof impinging under tension against said lugs  $B^6$  and adapted, by pressure thereupon of said springs, to maintain the said side pieces in an erect position and to permit them to be folded down upon said cross-piece B, said lug  $B^6$  adapted, by its rotation, to form a sliding bearing upon said spring C, and by passing beneath the fulcrum of said pivoted bearing prevent the tension of the said spring from restoring the said side pieces to an erect position until said lug is partially moved from beneath said bearing by a partial rotation of said side pieces upon said bearings, substantially as described.

5. In a folding rack, the side pieces A  $A'$ , having journal-box recesses  $A^{11} A^{11}$ , formed in the sides thereof opening outwardly, and an open space  $A^8$  between said journal-boxes and extended above and below, and socketed recesses  $A^7 A^7$ , opening inwardly above and below said space  $A^8$ , and a cross-piece B, provided with terminal pivot-pins  $B^3 B^3$  at each end thereof adapted to said journal-boxes  $A^{11}$ , and lug  $B^6$  upon a horizontal plane above or below said pins  $B^3$  and integral with B, and a stop  $B^8$  upon the side of said pins above or below said lug  $B^6$ , and said pins  $B^3$  adapted to be supported as a stop against the inner sides of said side pieces A  $A'$ , said cross-piece B adapted to enter by its end said space  $A^8$  and have its pins  $B^3 B^3$  engage in



the journal-boxes  $A^{11}$   $A^{11}$  and to be hinged therein, together with the springs  $C$   $C$ , one at each end of  $B$ , said springs supported at their extremities in said recesses  $A^7$   $A^7$ , extended across said space  $A^8$ , and the middle thereof sprung over and bearing against said lug  $B^6$  and adapted by its tension to maintain the said side pieces in an erect position, the inward movement of the tops of said side pieces limited by the stops  $B^8$   $B^8$  impinging against the sides of  $A$  and  $A'$  and adapted to maintain the same in a vertical position, substantially as described.

6. In a spring folding rack having side pieces  $A$   $A'$  hinged to the extremities of connecting cross-piece  $B$  and provided with spring-supports and springs acting upon said side pieces and said cross-piece, and one or more receptacles  $B^{13}$ , formed in said cross-piece  $B$ , substantially as described.

7. In a folding rack, in combination with the hinged side pieces  $A$   $A'$ , cross-piece  $B$ , pivoted thereto at the opposite hinge-bearings  $A^{11}$   $B^3$ , said cross-piece having one or more receptacles therein and said side pieces  $A$  and  $A'$  adapted to be folded longitudinally upon said hinge-bearings, the foot-supports  $A^6$   $A^6$  beneath said cross-piece  $B$ , and the hinged cover  $B'$ , adapted to said receptacle and provided with pivoted means of attachment  $B^7$  along the lateral margin thereof and in rear of said receptacle to said side pieces, said side pieces  $A$   $A'$  provided with means of attachment  $A^9$ , adapted to said  $B^7$ , the whole so constructed that when said side pieces  $A$   $A'$  are folded down the said attachments of said cover will be disengaged therefrom, and when erected the said pivoted bearings of said cover and side pieces will mutually engage with each other and form a hinged joint for said cover  $B'$  upon said receptacle  $B^{13}$ , substantially as described.

8. In a spring folding rack, the combination of hinged side pieces  $A$   $A'$ , supported upon pivoted end bearings of cross-piece  $B$ , and springs  $C$   $C$ , secured to said hinged bearings and operating as hereinabove described, said cross-piece  $B$  having one or more open receptacles  $B^{13}$ , with detachable cover  $B'$ , said cover having longitudinally-projecting pins  $B^7$   $B^7$  upon its rear margin and said side pieces having holes  $A^9$   $A^9$ , corresponding thereto, or the converse, said pins adapted to enter said holes and form a hinge for said cover when said side pieces are placed vertically and become disengaged therefrom when said side pieces are folded upon said cross-piece, substantially as described.

9. In combination with the folding rack consisting of hinged side pieces  $A$   $A'$ , hinge-bearings  $A^{11}$   $B^3$   $A^{11}$   $B^3$ , cross-piece  $B$ , sup-

ported springs  $C$   $C$ , acting upon lugs concentric to said hinged bearings and operating to maintain said side pieces in a vertical position while permitting the same to be folded along the line of said cross-piece, one or more receptacles along said cross-piece, and one or more ink-wells  $E$   $E'$ , adapted to said receptacles, together with cover or covers  $B'$   $B'$ , adapted to close said ink-wells and pivoted to said side pieces in rear thereof, said pivoted attachments disengaged by the opposite movement of the upper portions of said side pieces when folded upon said cross-piece, substantially as described.

10. In a pen-rack, in combination with side pieces  $A$   $A'$ , provided with hooks or notches  $a$   $a'$   $a'$  and cross-piece  $B$ , the internally-projecting pin  $A^{10}$ , formed upon one of said side pieces and out of contact with a series of pen-holders supported in said notches, and a rubber or other soft elastic sleeve  $D$  upon said pin  $A^{10}$  and permanently secured thereto for use as a fixed pen-wiper, substantially as described.

11. In a pen-rack, a pen-wiper composed of a fixed projecting pin surrounded by a sleeve of soft rubber, substantially as described.

12. As an article of manufacture, a spring folding rack consisting of a central cross-piece  $B$ , having terminal pivot-pins  $B^3$   $B^3$ , concentrically-placed lugs  $B^6$ , and stop  $B^8$  either upon said cross-piece or adjacent thereto, two side pieces  $A$   $A'$ , having externally-open journal-boxes  $A^{11}$   $A^{11}$ , the pivot-pins of said cross-piece adapted to enter the same from without, said side pieces having internal spring-supports  $A^7$ , open space  $A^8$ , and springs  $C$   $C$ , supported therein and operating from without against said lugs  $B^6$   $B^6$  to maintain said side pieces in a vertical position by impingement of said stops  $B^8$   $B^8$  against the adjacent faces of said side pieces, substantially as described.

13. As an article of manufacture, a folding rack having hinged side pieces  $A$   $A'$  and pivoted thereto so as to rotate in a vertical plane, a connecting cross-piece  $B$  and a spring operating at each hinged joint mutually against said side piece and a lug upon said cross-piece, the whole forming a knuckle spring-joint so that said side pieces may be folded flat along said cross-piece and so be held by the friction of said lug upon said spring, and may be erected vertically upon said cross-piece and held open by direct pressure of said springs upon said lugs, substantially as and for the purposes set forth.

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Witnesses:

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