

C. H. RICHARDSON & F. F. METZGER.

FOLDING BRACKET.

APPLICATION FILED MAR. 31, 1910.

975,069.

Patented Nov. 8, 1910.

4 SHEETS—SHEET 1.

Fig. 2.

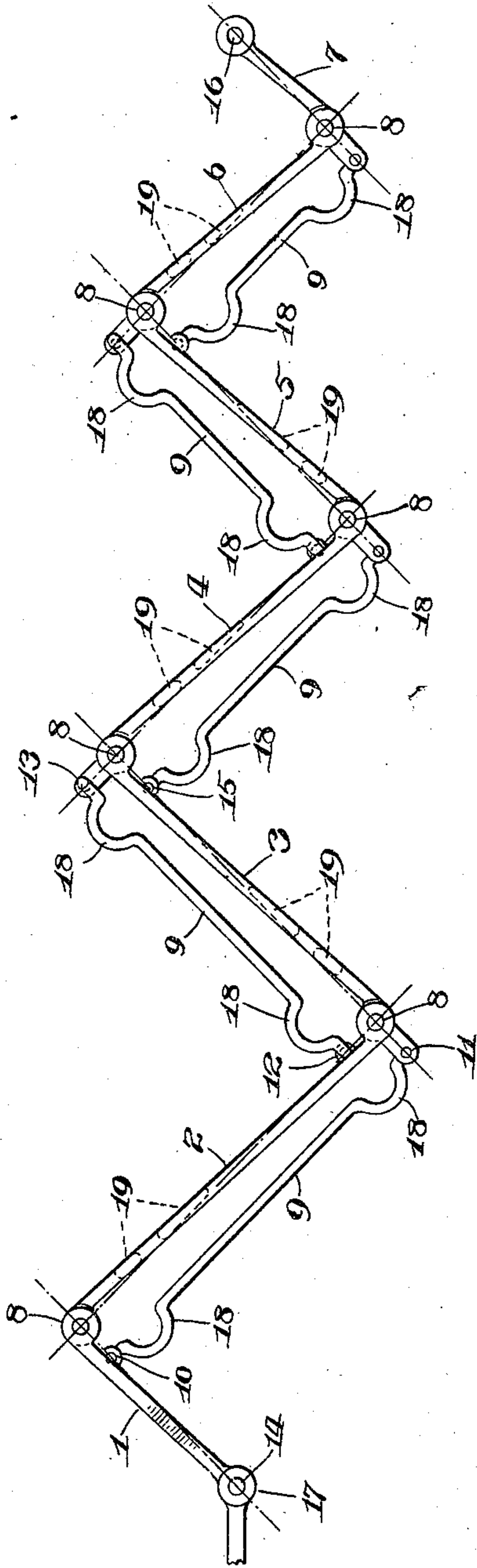
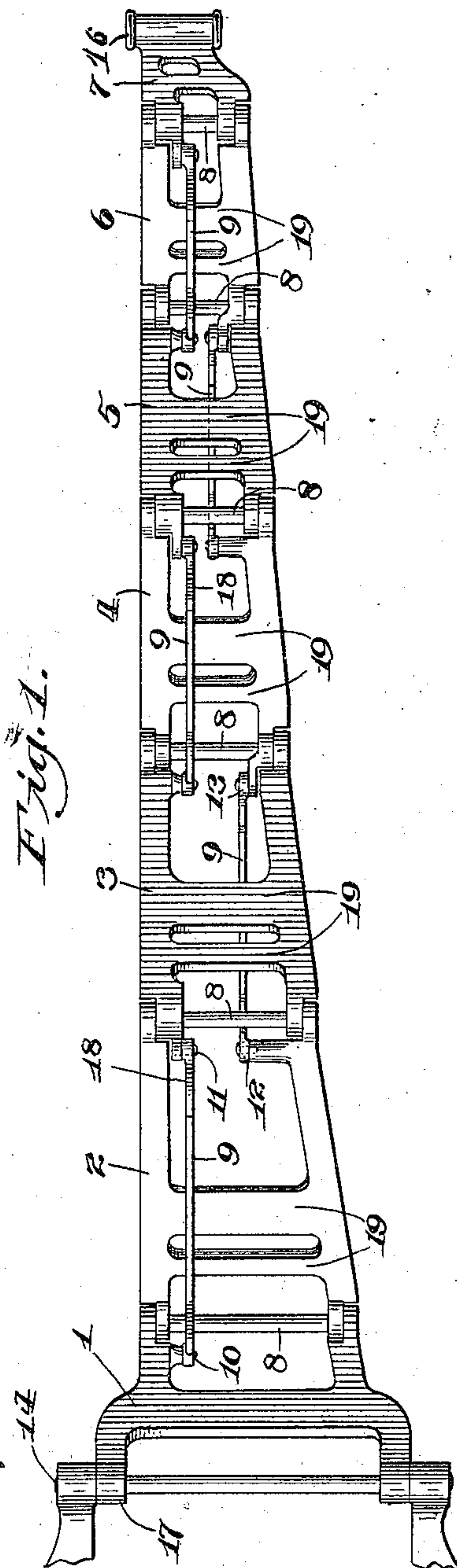


Fig. 1.



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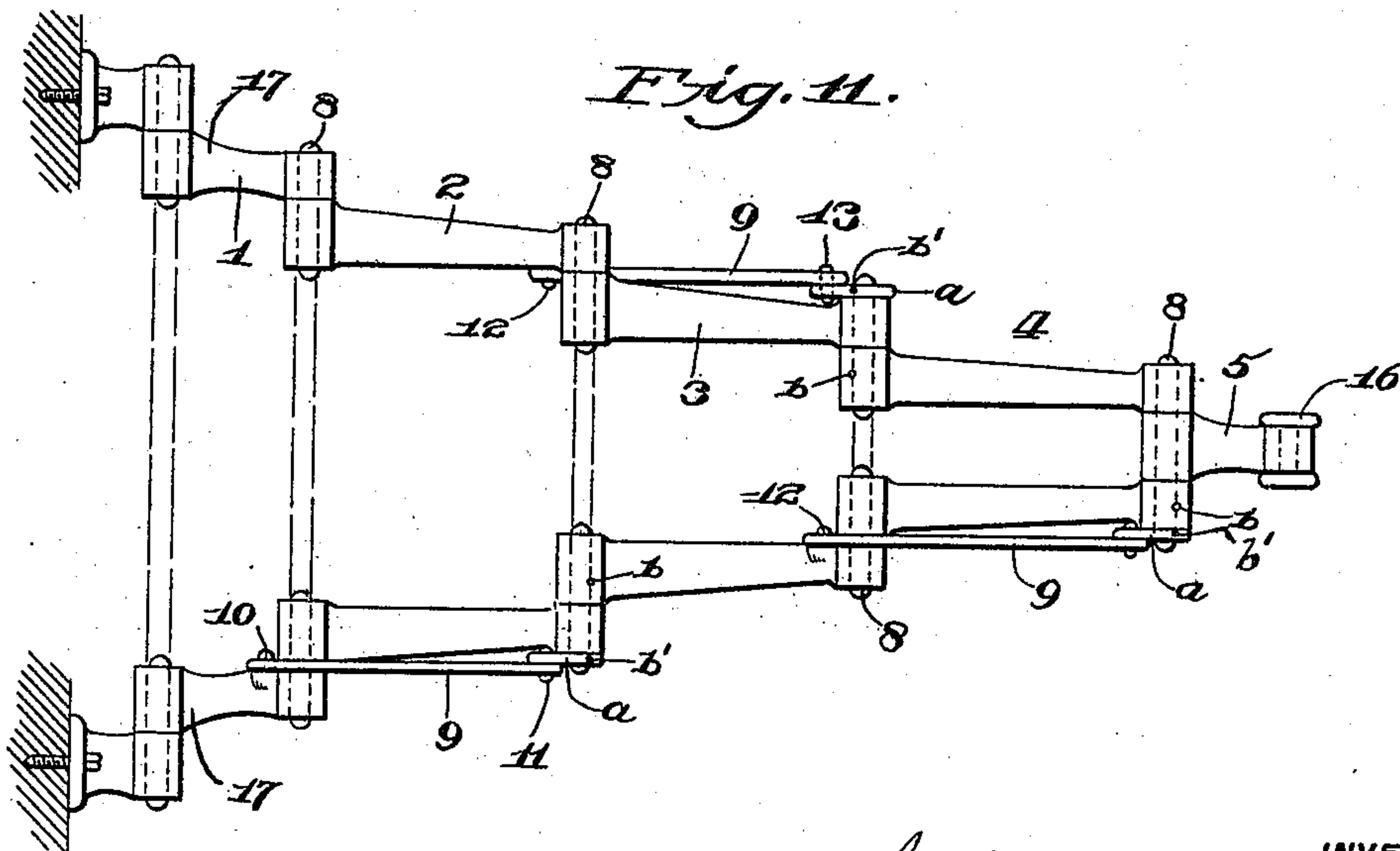
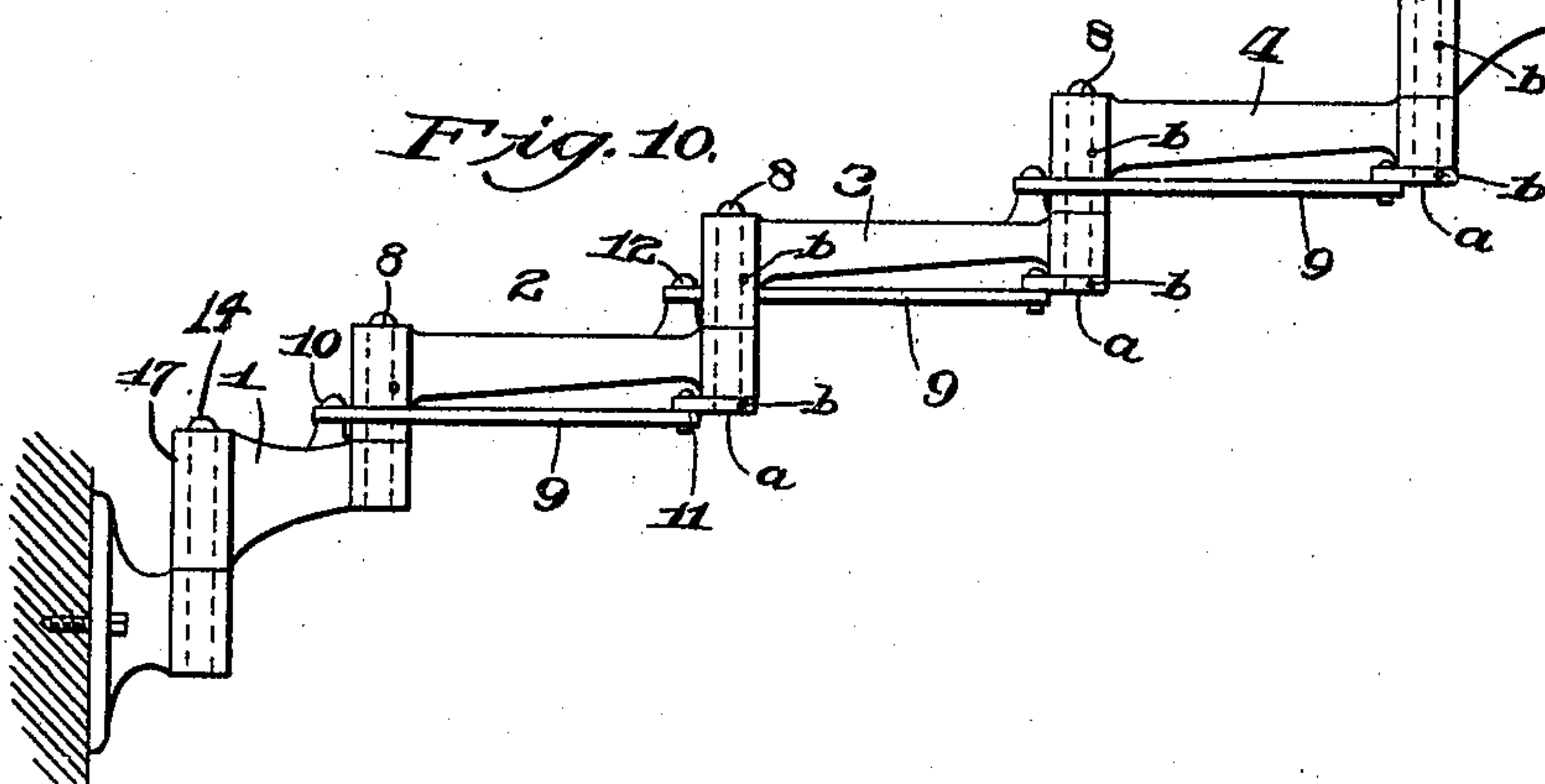
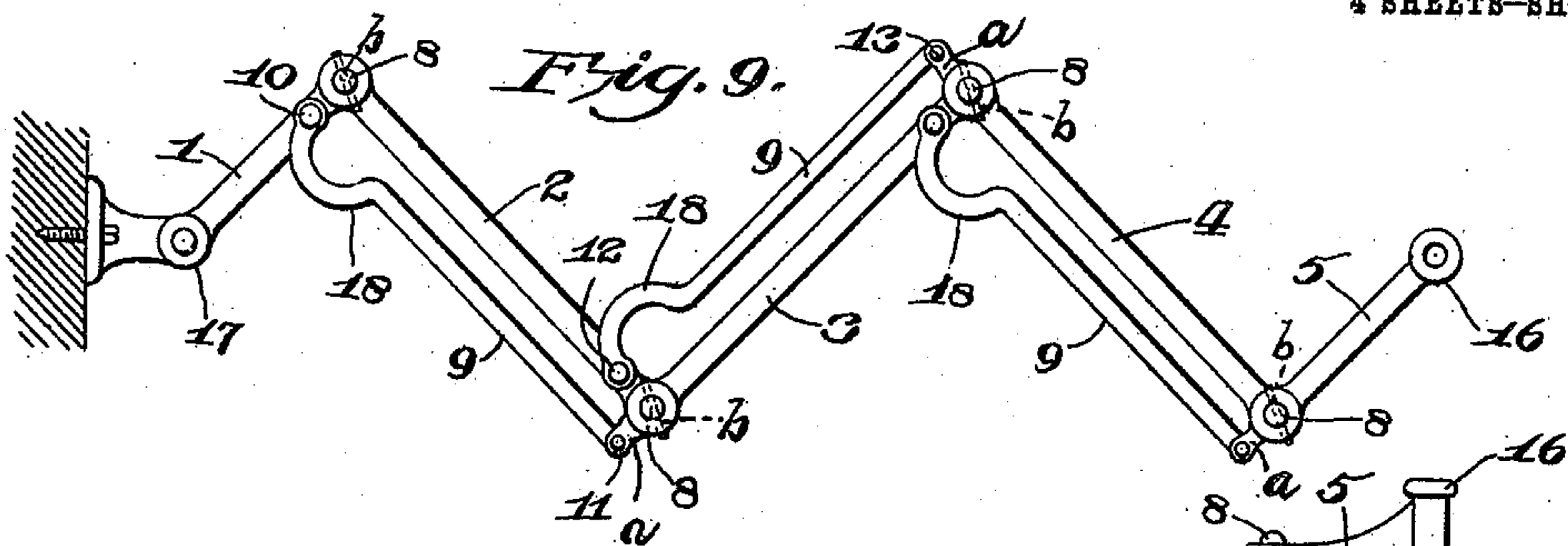
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4 SHEETS—SHEET 4.

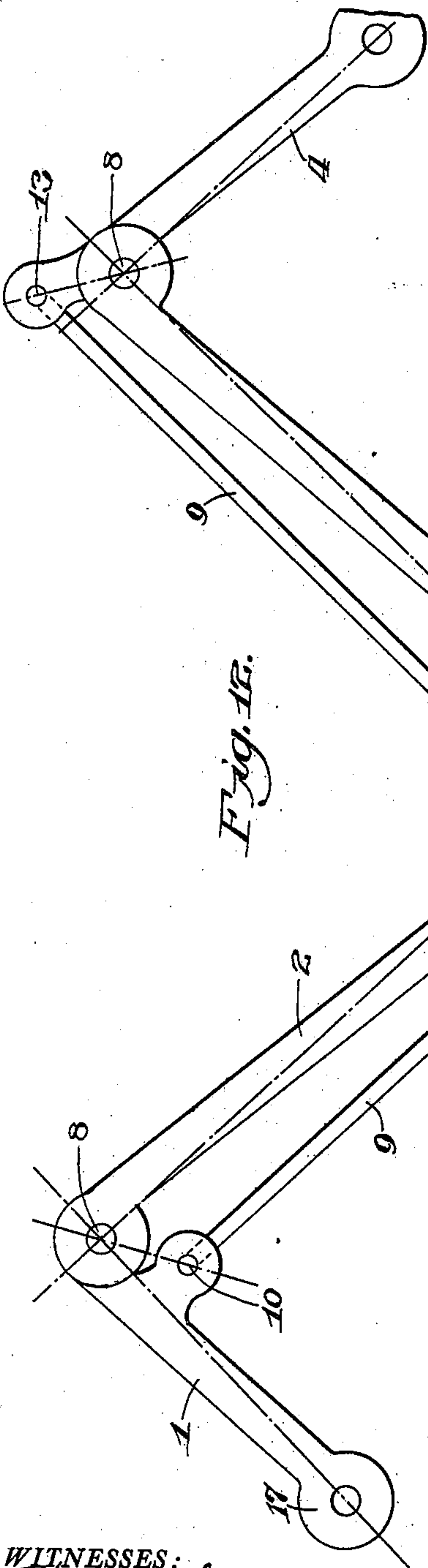


Fig. 12.

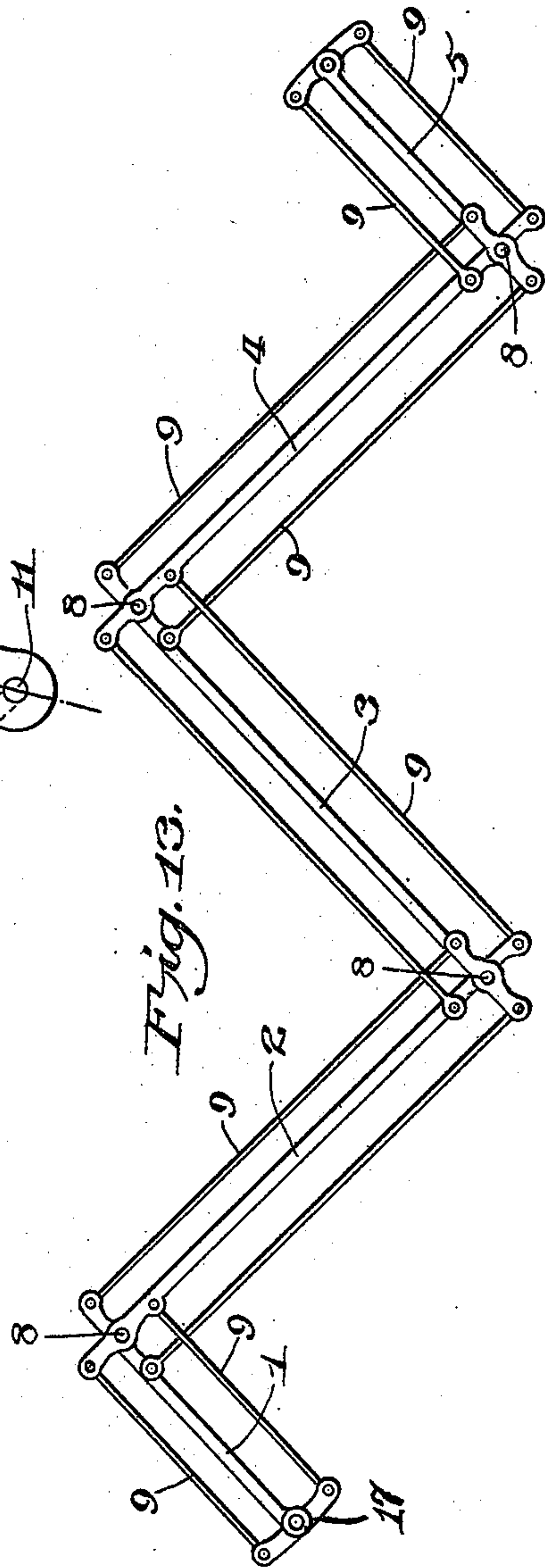


Fig. 13.

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# UNITED STATES PATENT OFFICE.

CHARLES H. RICHARDSON AND FERDINAND F. METZGER, OF PHILADELPHIA,  
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## FOLDING BRACKET.

975,069.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed March 31, 1910. Serial No. 552,515.

*To all whom it may concern:*

Be it known that we, CHARLES H. RICHARDSON and FERDINAND F. METZGER, citizens of the United States, and residents of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Folding Brackets, of which the following is a specification.

Our invention relates to improvements in extensible brackets, such, for instance, as are used to carry a dental engine, a table, a telephone, or other object; our aim being to furnish such a bracket which will be simple and practical in construction, rigid and efficient in action, give a longer reach when open, occupy less space when closed, and preserve the position of the object or objects supported in a manner superior to other forms of extensible brackets.

In the accompanying drawings, forming part of this specification, and in which similar letters of reference indicate similar parts throughout the several views; Figure 1, is a side elevation of one form of our bracket partly extended; Fig. 2, a plan of Fig. 1; Fig. 3, a plan view of part of the bracket, Figs. 1 and 2 enlarged, fully extended; Fig. 4, a plan view of part of the bracket fully closed; Fig. 5, a section through one of the main arms of the bracket on line A—A, Fig. 8; Fig. 6, a plan of the arm shown in Fig. 5; Fig. 7, an end elevation of Fig. 6; Fig. 8, a vertical distorted section of an arm following the centers of the sections and its pivots, the ends of adjoining arms being similarly shown; Fig. 9, a plan of the modification of the device in which the arms are mounted progressively one above the other; Fig. 10, a side elevation of Fig. 9; Fig. 11, a side elevation of a modification of the device in which a double combination of the form shown in Figs. 9 and 10 is employed; Fig. 12, a diagrammatic plan of a modification of the bracket shown in Fig. 2. Fig. 13, a diagrammatic plan of a modified form of bracket.

Our extensible bracket is formed of a number of folding arms (three or more) pivoted one to another at or near their ends so that they can be extended nearly in a straight line from the support or folded one against the other and close to the support.

The peculiarity of our bracket is that an opening or closing movement imparted to any one arm will be simultaneously trans-

mitted to all of the other arms in such a manner that a similar angular relation will be preserved between the several arms at all times.

1, 2, 3, 4, 5, 6, 7, Figs. 1 and 2, are arms secured one to the other at or near their ends by pivots 8 around which they can rotate, turn or swing. These arms may be of equal or of unequal lengths, but it is preferable, in order that the bracket may present a symmetrical appearance, more particularly when closed, that the extreme rear and front arms, in the drawings 1 and 7, be approximately one-half the length of the next adjoining arms as shown in the drawings.

The arms intermediate of the end arms may be of equal length as shown in Figs. 3, 4, 9 and 10, or they may successively decrease in length toward the outer end of the bracket as shown in Figs. 1 and 2. The latter construction, presenting the neatest appearance, is preferred.

The main arms 1, 2, 3, &c., may be jointed one inside the other as shown in Figs. 1 and 8, or they may be jointed above, as shown in Fig. 10, or below one another as shown in Fig. 11. In the two latter constructions the pivot pins 8 which connect adjoining ends of the arms 1, 2, 3, &c., are secured fixedly to one of the adjoining arms, by pins *b*, for instance, and turn freely in the other arm. The cranks or levers *a*, which are pivotally connected at 10, 11, 13, Figs. 10 and 11, to the controlling rods 9, are also fastened securely to the pivots 8 so that any movement given to either the arm 9 or controlling rod will be transmitted to the other.

The reference letter *b'* indicates a pin which may be employed to secure the arms or levers *a* to the pins 8.

Connecting each alternate main arm are means for causing any movement of any one main arm around its pivotal connection to the next arm to impart to the other main arm a similar angular movement. As illustrated in the drawings this means consists, in the present case, of equalizing or controlling rods 9, there being a controlling rod connecting each alternate main arm, but any other means for accomplishing this object may be used. From the drawings it will be seen that one end of a controlling rod 9 is pivoted to arm 1 at 10 and at the other end to the arm 3, or to a projection of this arm, at 11. The next controlling rod is



pivoted at one end to the main arm 2 at 12, and at the other end to the arm 4, or to a projection of this arm, at 13, and so on. The pivots 14 and 8 at opposite ends of the main arm 1, and the pivot 10 on this arm, to which one end of the first controlling rod 9 is pivoted, are, preferably, all in line. The main pivots 8 at opposite ends of the arm 2 and the pivot 12, carried by arm 2, to which one end of the second controlling rod 9 is pivoted, are preferably, all in line. The main pivots at opposite ends of the main arm 3 and the pivot 11 on this arm to which the outer end of the first controlling rod 9 is secured and the pivot 11 on this rod to which the inner end of the third controlling rod 9 is secured, are preferably all in line, and so on, the broken lines in Figs. 2, 3, 4, 5 and 6 being inserted in the drawings to clearly show this feature of the preferred construction. In the above figures the secondary pivots carried by the main arms, to which the end of the controlling rods 9 are secured, are all shown at equal distances from the main pivots 8. The ends of each separate controlling rod must, for the proper working of our device, be attached to their main arms at equal distances from the main pivots, but it is not necessary that all of the controlling rods be attached to the main arms at equal distances from the pivots 8, each rod may be attached to its arms at points found convenient so long as its own pivots are at equal distances from the pivots of the arms.

In Fig. 12 is shown a modification of our bracket in which the pivots carried by the main arms are out of line, but a line passed through the centers of the pivot 8, at the upper end of arm 2, and the pivot 10 on arm 1 is parallel to a line passed through the centers of the pivot 8, at the lower end of arm 2, and the pivot 11 carried by arm 3, and a line passed through the centers of pivot 8, at the lower end of arm 2, and the pivot 12 carried by arm 2 is parallel to a line passing through the centers of pivot 8, at top of arm 3, and pivot 13 carried by arm 4, and so on.

In Fig. 13 a form of bracket is shown with double sets of controlling rods—each main arm having upon opposite sides controlling arms.

The several controlling arms 9 pivoted to the several main arms as shown and described will cause each alternate main arm, as 1, 3, 5, &c., and 2, 4, 6, &c., to open and close parallel to one another, hence the angles between the several main arms will always be practically equal. Thus a synchronous movement in all the parts is insured when the bracket is opened or closed, and, when the lengths of the several arms are properly proportioned, the outer end 16 of the outer arm, which is designed to carry

an engine, a table, or other object, is caused to move in or out from the supported, or wall end, 17, in a straight, or practically straight, line.

In order that the several main arms may be extended so as to form an almost straight line as shown in Fig. 3, or be closely folded together, the controlling rods 9 are bent or recessed at 18 so as to clear the main pivots 8 or the bosses on the main arms through which the pivots pass; except when said controlling rods are placed above or below the main arms when the said controlling rods can be straight as shown in Figs. 12 and 13. The controlling rods 9 are so placed as not to engage one another, as shown in Figs. 1, 8, 10 and 11, and the thickness of the main arms is preferably not more than one-half the diameter of the bosses which they carry. For the same purpose the bosses are preferably placed one to one side and the other to the other side of their carrying members, as shown in Figs. 5 and 6, and the webs 19 connecting the top and bottom chords of these members are beveled and placed as best shown in Figs. 5 and 6, so as to be cleared by the rods 9 when the bracket is either fully open or closed.

The inner end of the inner arm 1 of the bracket is usually pivoted or otherwise suitably secured to the wall or other support as shown in the drawings, and the outer end of the outer arm is usually employed to carry the object which the bracket supports, but we do not desire to confine ourselves to these particular points for these attachments as they can be made where most convenient and the bracket can obviously be adapted for carrying more than one object.

We believe that it is most advantageous to arrange the bracket so that all of the pivots 8, as well as the carrying pivot 14 will be vertical, for in this arrangement the bracket can be swung around the pivot 14 in a horizontal plane and will remain in any position within the limits of its swing that may be desired; however, we do not limit ourselves to any particular manner of attaching it to its support.

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

1. In an extensible bracket, in combination, three or more arms pivoted one to the other, and means connecting alternate arms at or near their ends for causing a movement imparted to any one arm to move all of the other arms inwardly or outwardly simultaneously.

2. In an extensible bracket, in combination, three or more arms pivoted together at or near their ends, and means substantially parallel to the axis of the intermediate arm connecting alternate arms for causing all of



them to open or close simultaneously from a fully extended position to one where the arms lie side by side close together.

3. In an extensible bracket, in combination, three or more arms pivoted together at or near their ends, and means connecting said arms for causing them to open or close simultaneously, said means forming with the main arms elongated parallelograms, the long sides of the parallelograms formed of an arm and the connecting means and the two short sides formed by fractional lengths of the arms, or extensions of the arms, adjoining the first arm.

4. In an extensible bracket, in combination, three or more arms pivoted together at or near their ends, and controlling rods connecting alternate arms, the axis of said controlling rods and of the adjacent intermediate arms being substantially parallel, said controlling rods being pivoted to the alternate arms, or extensions on the arms, at points distant from the main pivots less than half the lengths of the arms.

5. In an extensible bracket, in combination, three or more main arms pivoted together at or near their ends, and controlling rods pivoted to and connecting alternate main arms without crossing the intermediate arm, the pivotal connection of said rods to said arms and the pivots securing said arms to the adjoining arms being in line.

6. In an extensible bracket, in combination, three or more main arms pivoted together at or near their ends, and controlling rods pivoted to and connecting alternate arms, said rods being arranged so as to permit a close folding of the arms.

7. In an extensible bracket, in combination, three or more arms pivoted together at or near their ends, and controlling rods pivoted to and connecting alternate arms, said pivoted connections being made upon the body of one arm inside the pivotal connection of said arm and the next adjoining arm, and with a projection on said alternate arm beyond the pivotal connection of this latter arm and the intermediate arm, said rods be-

ing bent or recessed as at 18, as and for the purposes set forth.

8. In an extensible bracket, in combination, three or more main arms forming each a frame the ends of which carry upon opposite sides, bosses, and which are furnished at one end with an extension beyond the bosses adapted to carry one of the pivots of a controlling rod, and upon the other end, inside the boss, with a pivot to carry the end of another controlling rod, main pivots passing through said bosses, securing adjoining ends of said arms, and controlling rods connecting alternate arms, one of the ends of said rods being carried by the pivot on the extension of one arm, and the other by the pivot inside the end of the alternate arm, adjoining rods moving in different planes and being bent or recessed to clear the bosses carried by the ends of the arms.

9. In an extensible bracket, in combination, three or more arms consisting each of a webbed frame the ends of which carry, upon opposite sides, bosses, and which are furnished at one end with an extension beyond the bosses adapted to carry one of the pivots of a controlling rod, and upon the other end, inside the boss, with a pivot to carry the end of another controlling rod, main pivots passing through said bosses securing adjoining ends of said arms, and controlling rods connecting alternate arms, one of the ends of said rod being carried by the pivot on the extension of one arm and the other end by the pivot carried inside the end of the alternate arm, adjoining rods moving in different planes and being bent or recessed to clear the bosses carried by the ends of the arms, the webs joining the top and bottom chords of the main arm frames being beveled, all substantially as and for the purposes set forth.

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