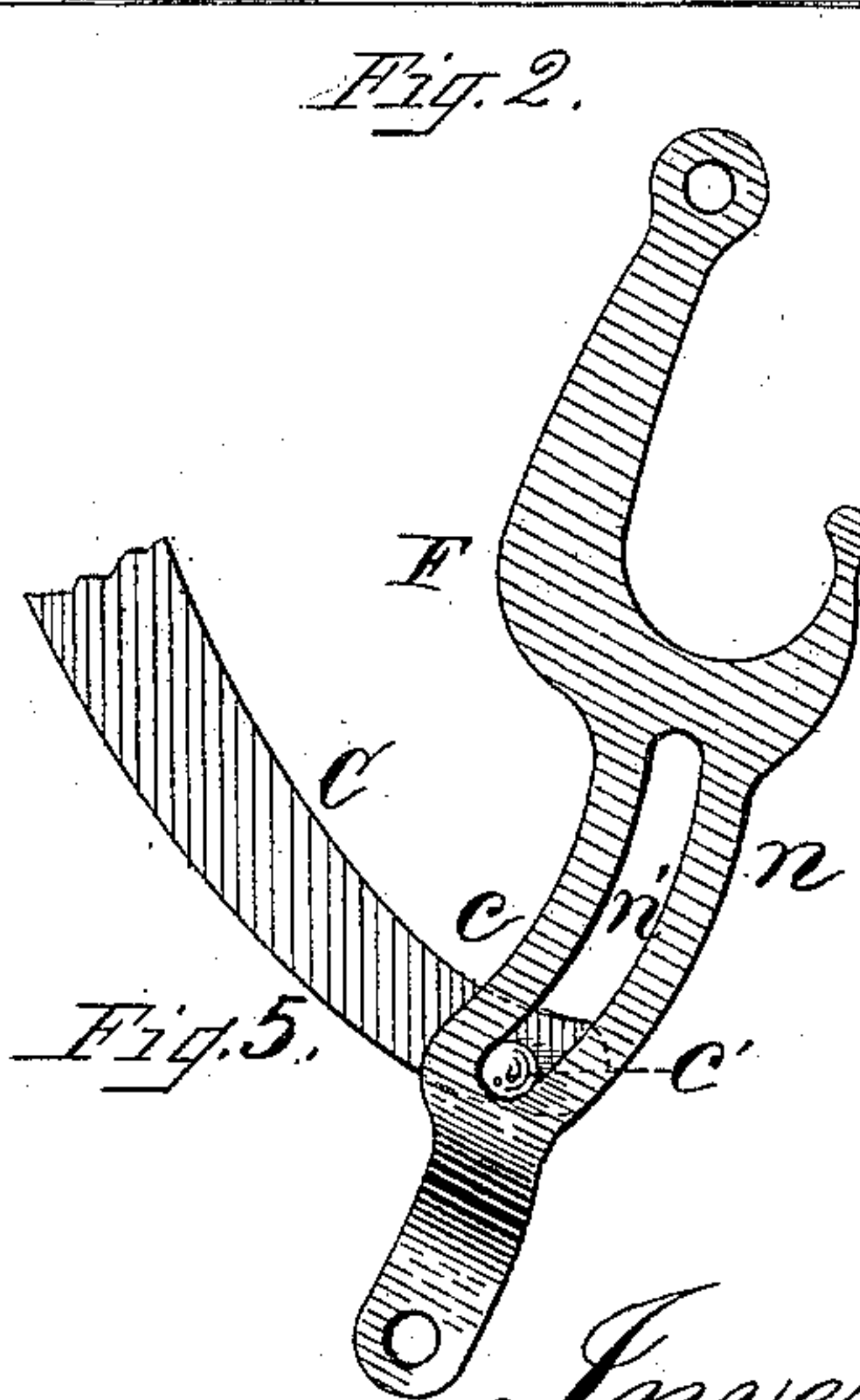
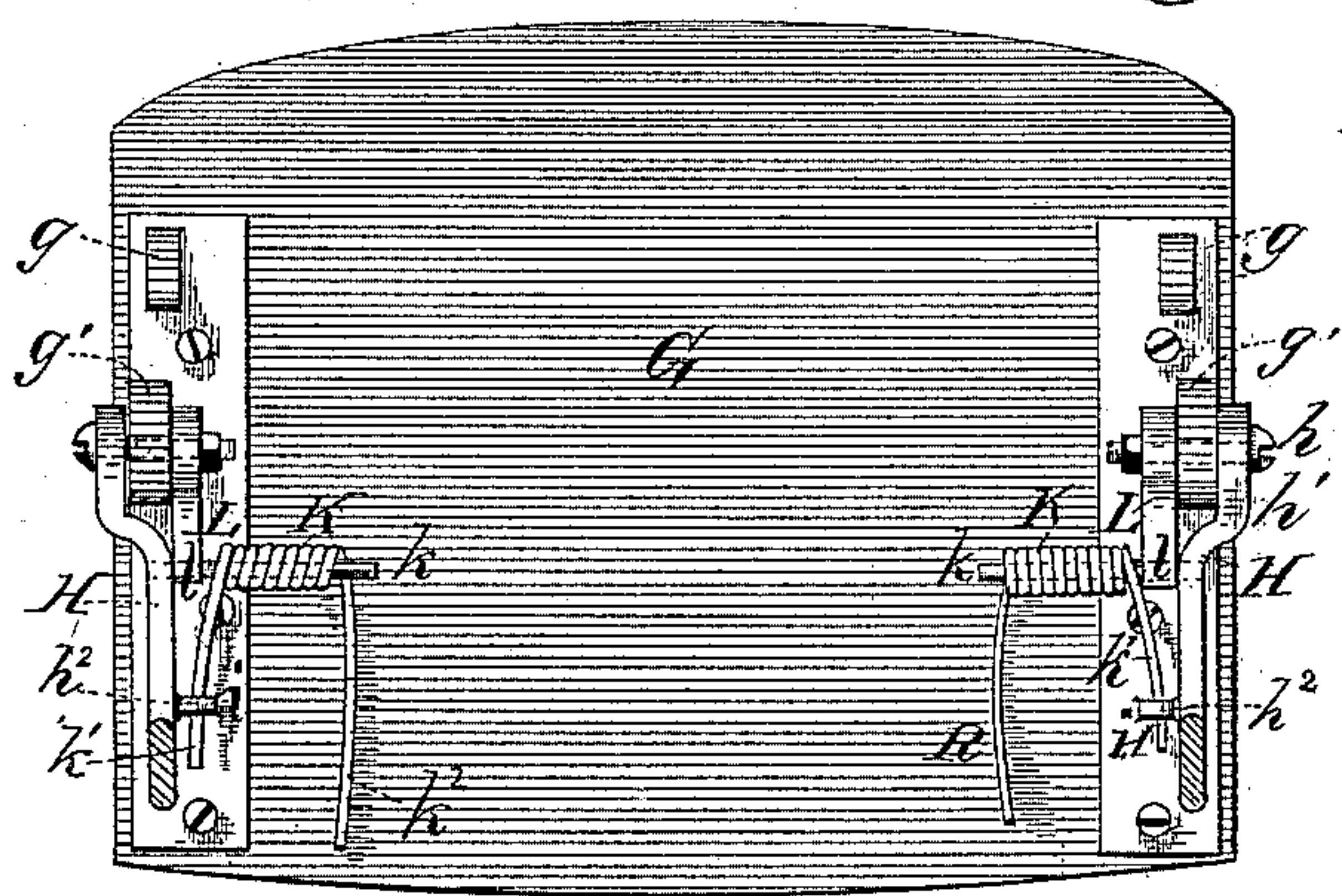
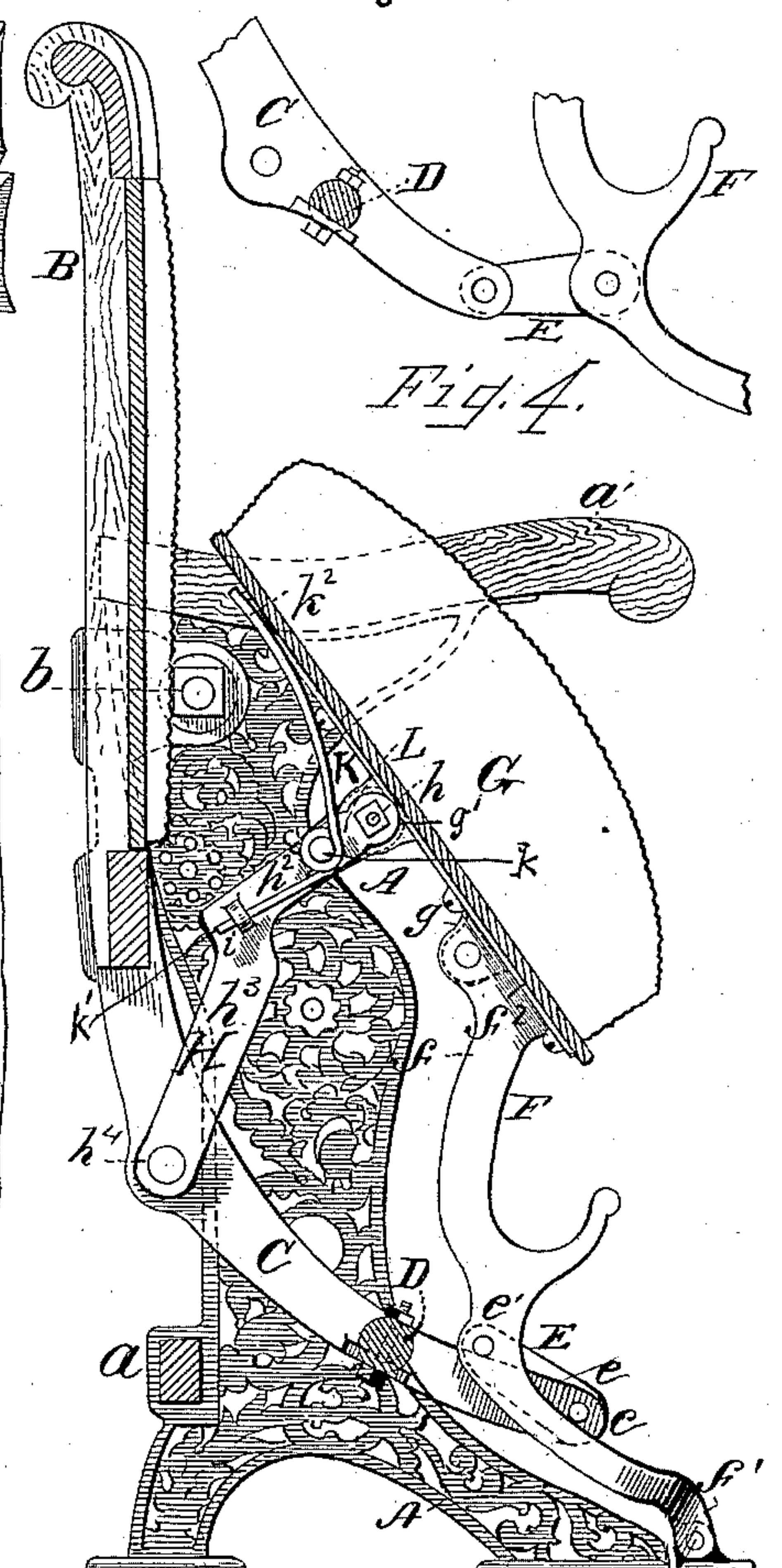
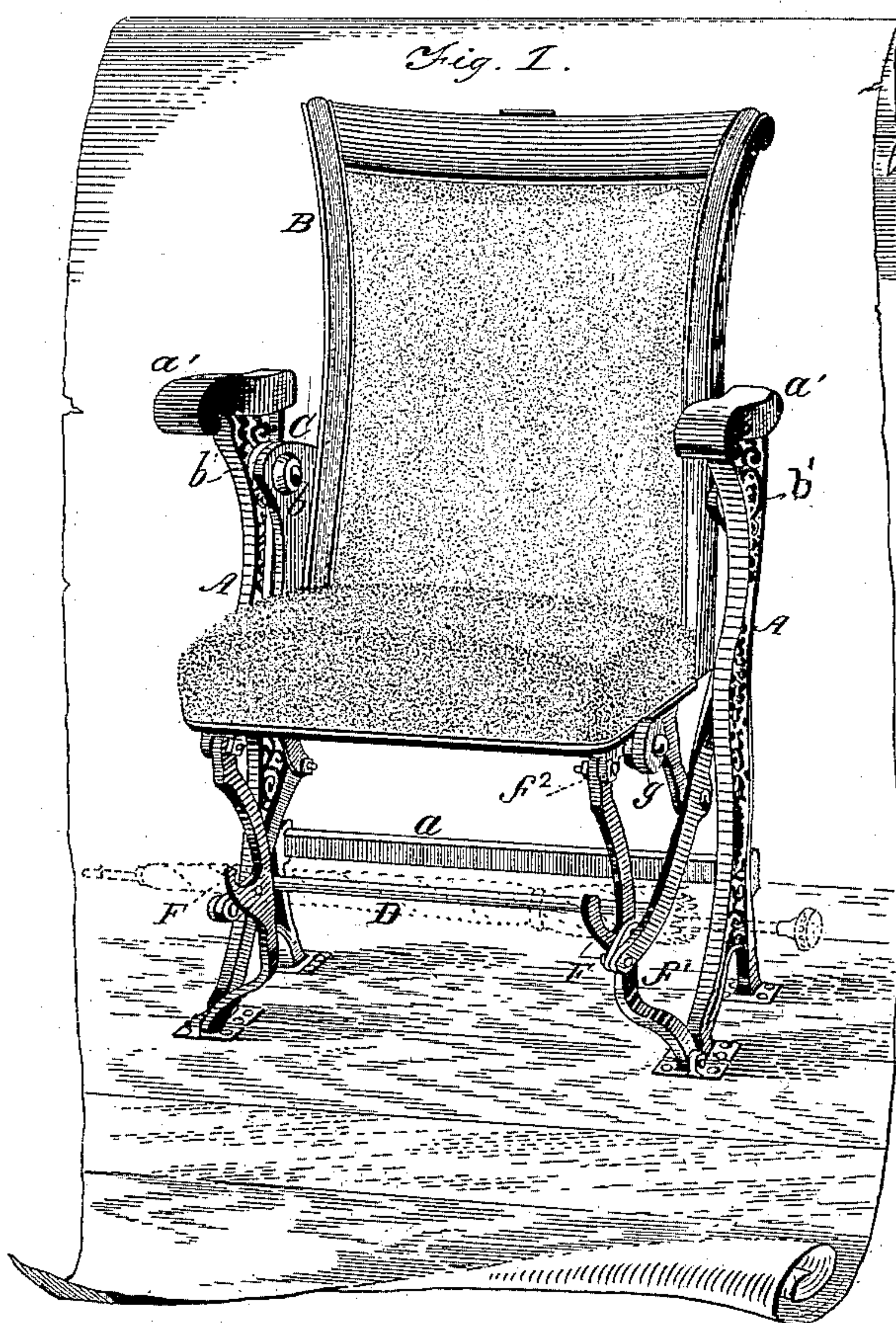


(No Model.)

H. J. HARWOOD.
OPERA CHAIR.

No. 427,570.

Patented May 13, 1890.



Witnesses.
H. E. Bernick.
C. F. Fadeluy.

Inventor
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Atty.

UNITED STATES PATENT OFFICE.

HERBERT JOSEPH HARWOOD, OF LITTLETON, MASSACHUSETTS.

OPERA-CHAIR.

SPECIFICATION forming part of Letters Patent No. 427,570, dated May 13, 1890.

Application filed October 18, 1889. Serial No. 327,476. (No model.)

To all whom it may concern:

Be it known that I, HERBERT JOSEPH HARWOOD, a citizen of the United States, residing at Littleton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Opera-Chairs; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a perspective view of an opera-chair embodying the invention. Fig. 2 is a transverse vertical section. Fig. 3 is a bottom view of the seat. Figs. 4 and 5 are modifications.

This invention relates to what are styled "opera-chairs," being chairs or seats more especially designed for theaters or opera-houses, where the seats are in rows close to one another.

In United States Patent No. 325,283 there is shown a folding chair which apparently resembles mine, and would seem to be designed to accomplish somewhat similar results; but, as will be hereinafter shown, my device differs materially therefrom.

The present invention relates more particularly to a folding chair which is in its action automatic—that is, there is no need of using the hands either to open or close it.

In the annexed drawings, the letter A indicates the usual chair-standards, spaced apart and braced by the rear bar *a*, and having the usual arm-rests *a'*. Just below these arm-rests there is journaled to the standards A the back B by pins *b*, passing through the forward projections *b'* of the castings C, secured to the side edges of the back. These castings C pass downward below the back and are curved forward, forming lever-arms. They are spaced apart and braced at their lower parts by the cross-bar D. At its lower ends *c* each lever-arm C is pivoted to one end *e* of a link E, and its other end *e'* is pivoted to the front leg or brace F of the seat G. This leg or brace F is pivoted at its upper end *f* to a lug *g* on the seat, and at its lower end *f'* to the standard A, or in front thereof, as shown

in Figs. 1 and 2. The upper end *f* of the leg or brace F has the top bearing *f*² and its lower end *f'* is turned outward. On each side, about the middle, there depends from the seat G a lug *g'*. Passing through these lugs are the pivot-bolts *h*, on the outer ends of which are secured the upper ends *h'* of connecting-bars H. These bars H have a straight upper portion *h*², forming flat rests on top, and extending therefrom are the angular parts *h*³, which are pivoted at *h*⁴ to the lever-arms C. From the inside of the arms H, near the seat G, there extend pins *k*, about which are encircled the spiral springs K. One end *k'* of these springs K is caught in eyes *i* on the bars H, and the other end *k*² of the springs K bears loosely against the bottom of the seat G, to the rear of the bars H. Pivoted on the inner ends of the bolts *h* are the supports L, their free ends *l* being forked and resting against the pins K, equalizing the strain at these points and locking the nut to the bolt *h*.

In Fig. 4 is shown a modified way of connecting the lower ends of the lever-arms C C with the front supports of the seat. Here the links E E are made as continuations of the lever-arms C C.

In Fig. 5 is shown still another modification. Here the front supports F F are made with an outward curve *n* and are provided with curved slots *n'*. In the lower ends *c c* of the lever-arms C C are placed pins *c' c'*, which work in these slots. It will be seen that all of these modifications form a toggle-like connection at the front of the chair, and where the expression "toggle-joint" or "toggle-connection" is used I wish to be understood as meaning all three of the forms shown.

The construction described furnishes the seat with two toggle-connections with the back—one in front and the other in the rear. The result produced by this construction is that either the seat or the back can be operated by moving the other. When the chair is in the position shown in Fig. 2, the seat is supported on the rests *f*², the back is forward, and the springs K K relaxed. Upon pressure being applied to the back B to swing it backward, the power is transferred to the seat, tilting it downward into position for occupancy. This action compresses the springs K K. As soon as the occupant rises, these

throw the seat G back into the position shown in Fig. 2.

Instead of operating the chair by taking hold of the back, it is only necessary for a person to sit down on the seat when it is in the position shown in Fig. 2. The seat is forced down into its proper position upon the rests $h^2 h^2$. This action swings the back B backward, so that whether the back or the seat is moved the other part is affected.

Having thus described my invention, what I claim is—

1. The combination of the standards A A, the back B, pivoted in the standards and having the lever-arms C C, the seat G, the braces F F, pivoted to the seat and at their lower ends, and the bars H H, pivoted to the seat and to the lever-arms C C, the latter having a toggle-connection with the standards F F, as set forth.

2. The combination of the standards A A, the back B, pivoted in the standards and hav-

ing the lever-arms C C, the seat G, the braces F F, pivoted to the seat and at their lower ends, the bars H H, pivoted to the seat and to the lever-arms C C, and a spring interposed between the seat and the bars H H, the lever-arms having a toggle-connection with the standards F F, as set forth.

3. The combination of the standards A A, the back B, pivoted in the standards and having the lever-arms C C, the seat G, the braces F F, pivoted to the seat and at their lower ends, the bars H H, pivoted to the seat and to the lever-arms C C, and links E E between the standards F F and lever-arms C C, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HERBERT JOSEPH HARWOOD.

Witnesses:

CHESTER M. SYLVIA,

ALBERT G. Y. MACADAM.