

No. 667,439.

Patented Feb. 5, 1901.

M. W. HALL.  
FOLDING BED.

(Application filed Jan. 15, 1900.)

(No Model.)

2 Sheets—Sheet 1.

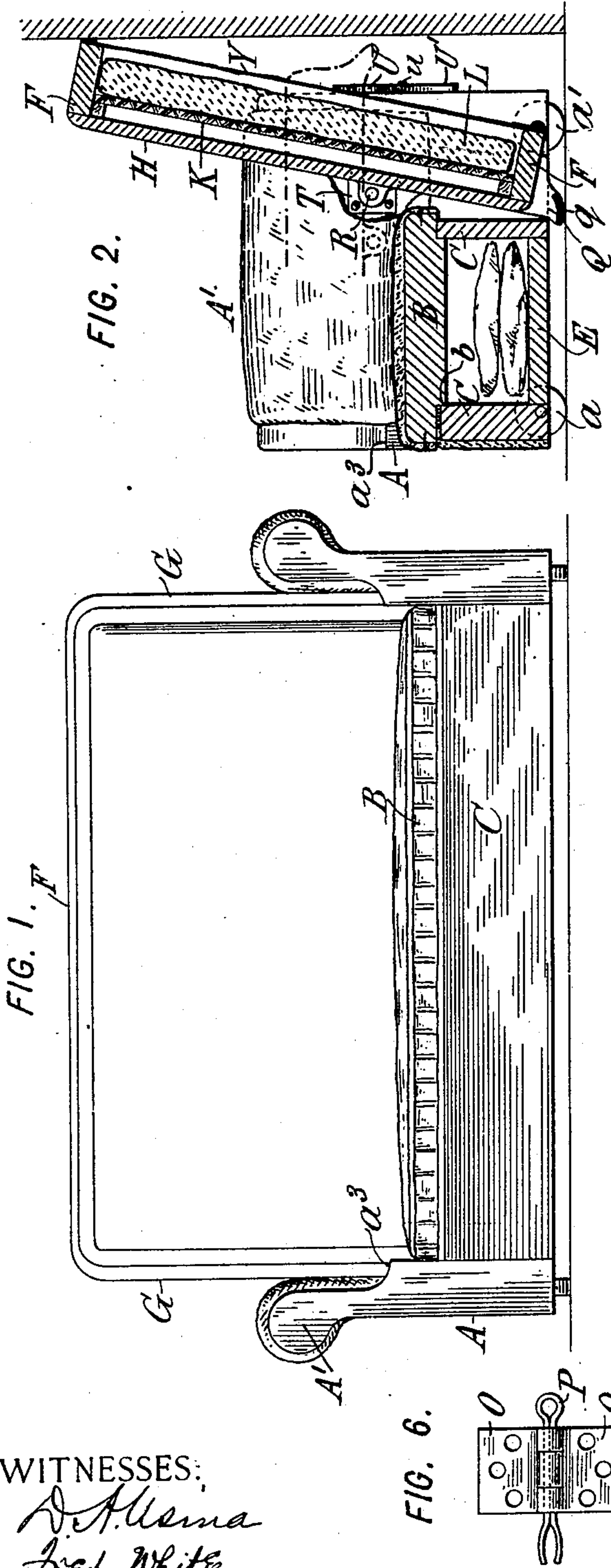


FIG. 2.

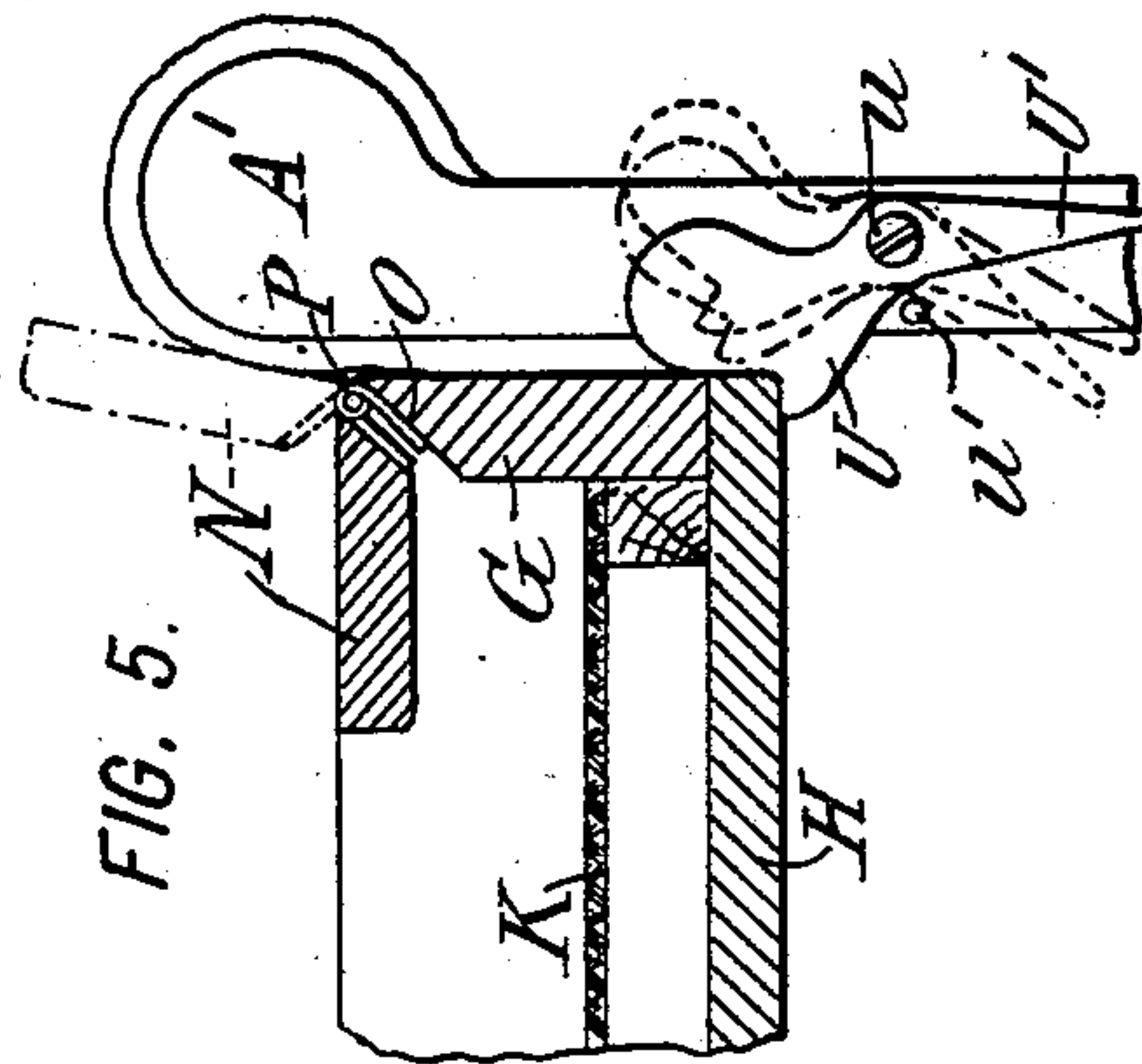


FIG. 5.

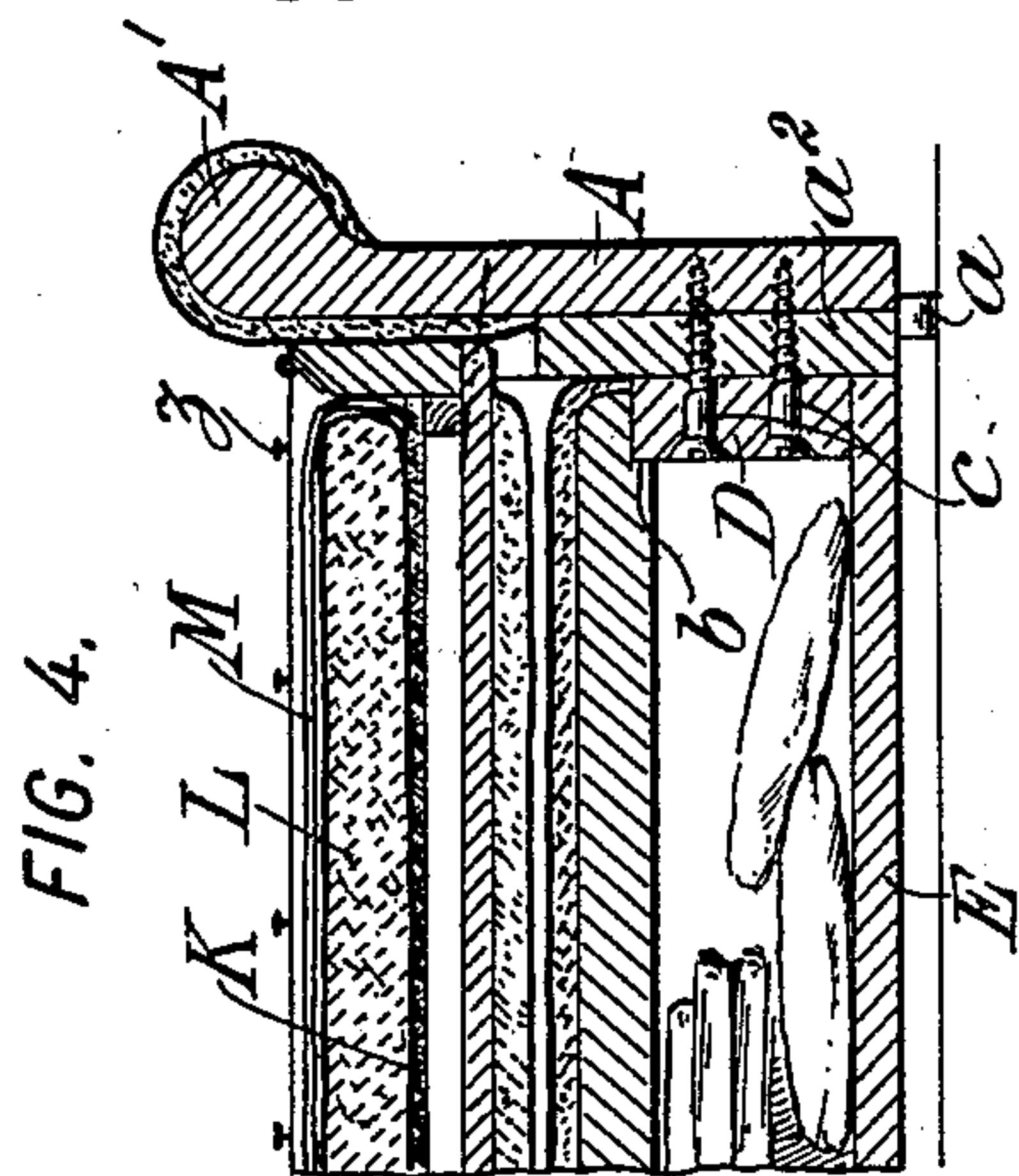


FIG. 4.

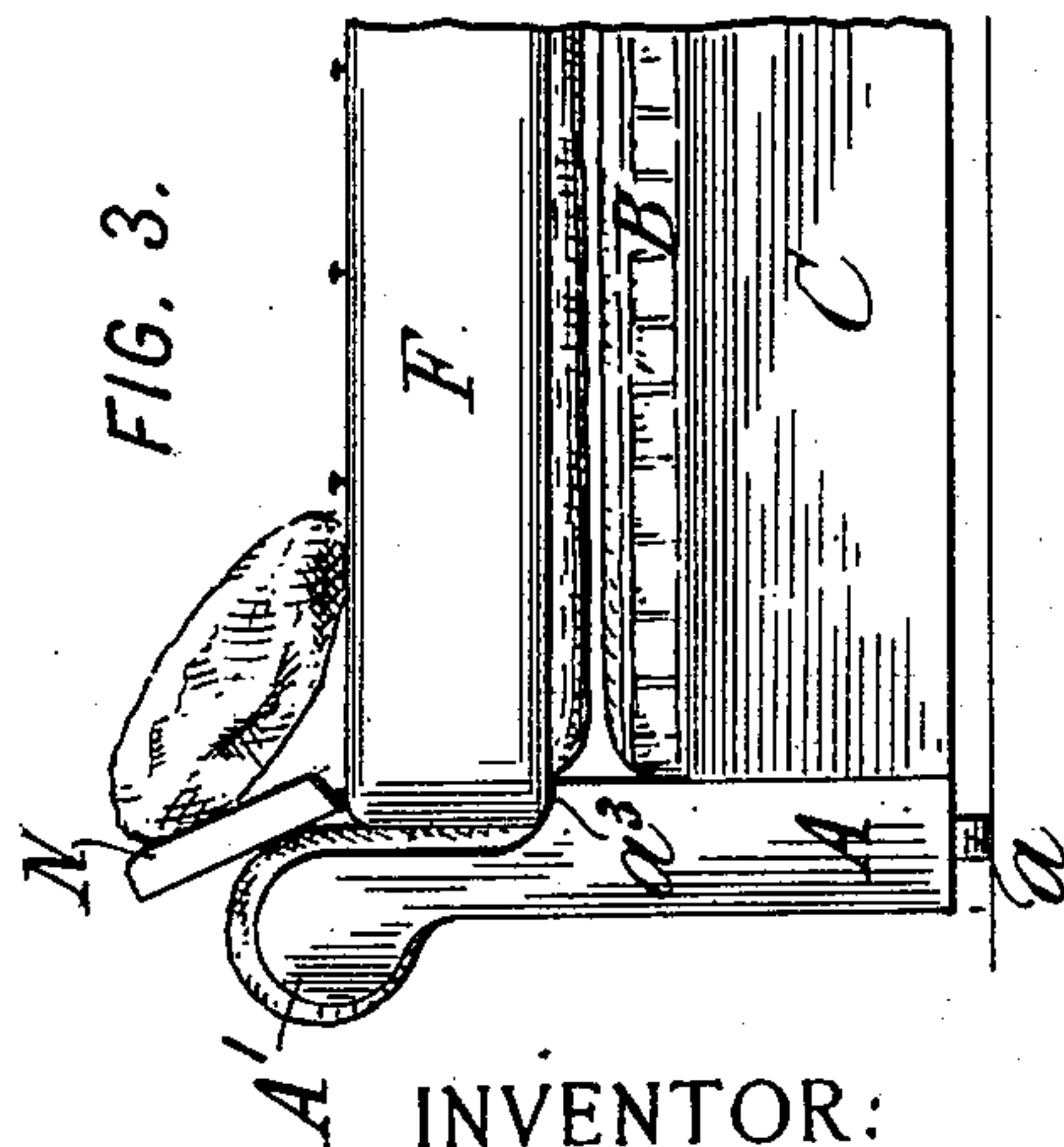
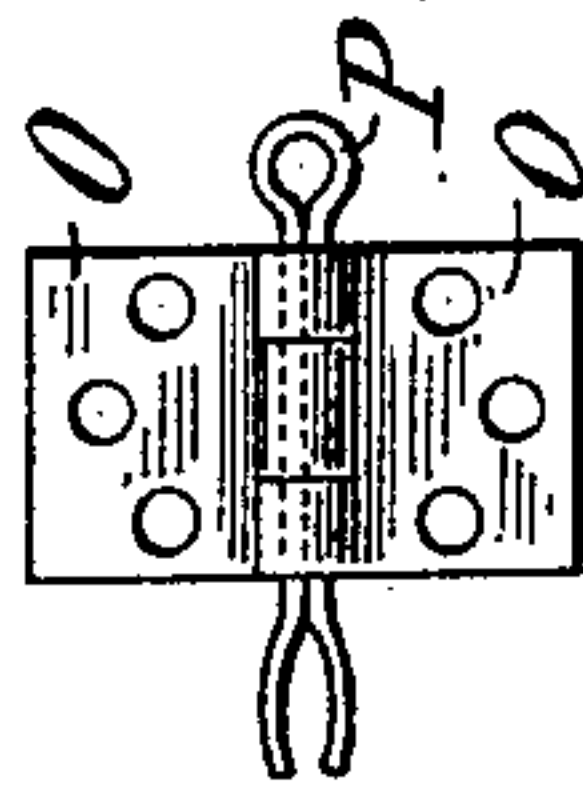


FIG. 3.

FIG. 6.



WITNESSES:

*D. A. Meina*  
*Fred White*

INVENTOR:

*Milan W. Hall,*

By Attorneys,

*Wm. L. Fraser & Co.*

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FIG. 7.

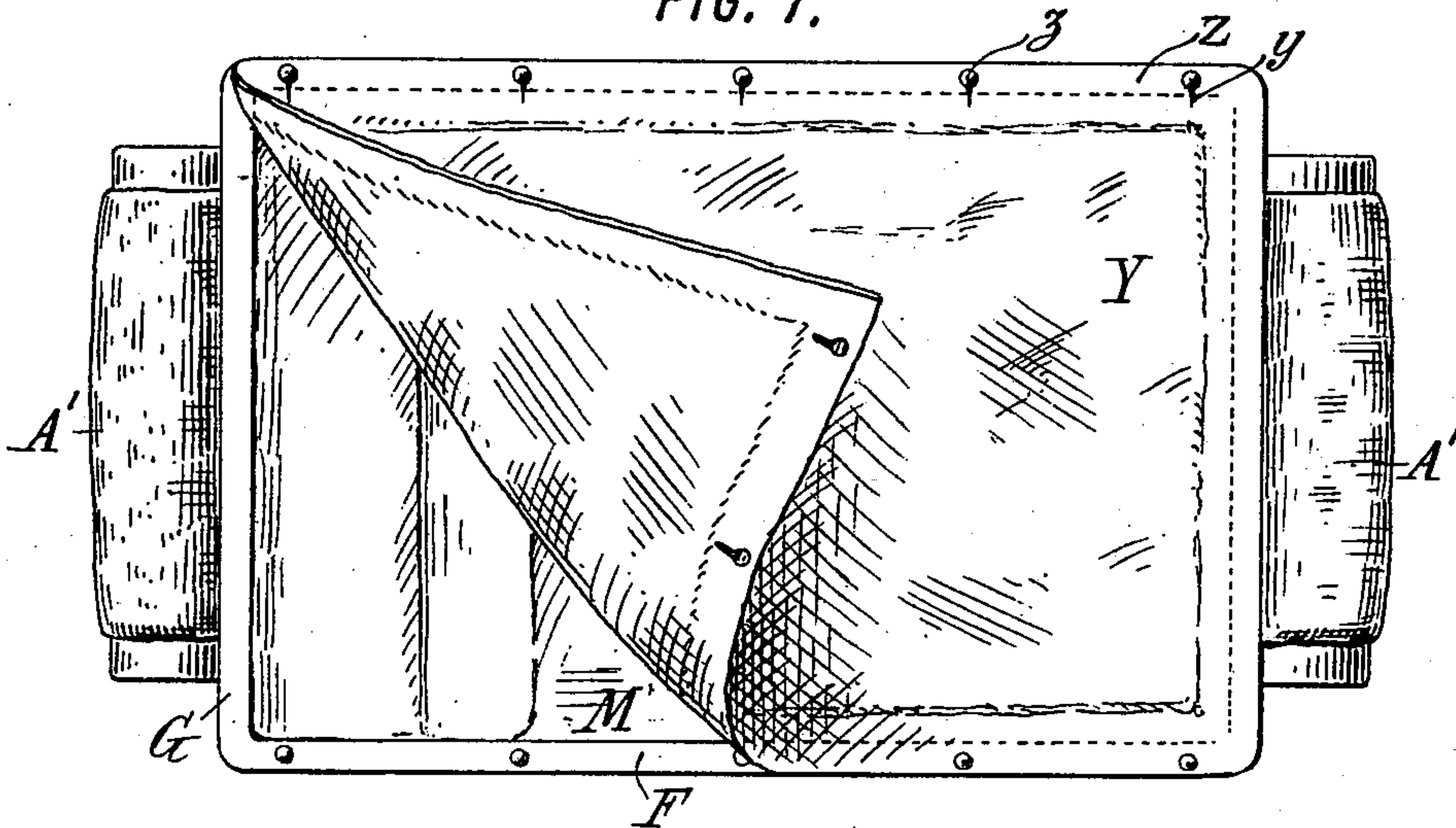
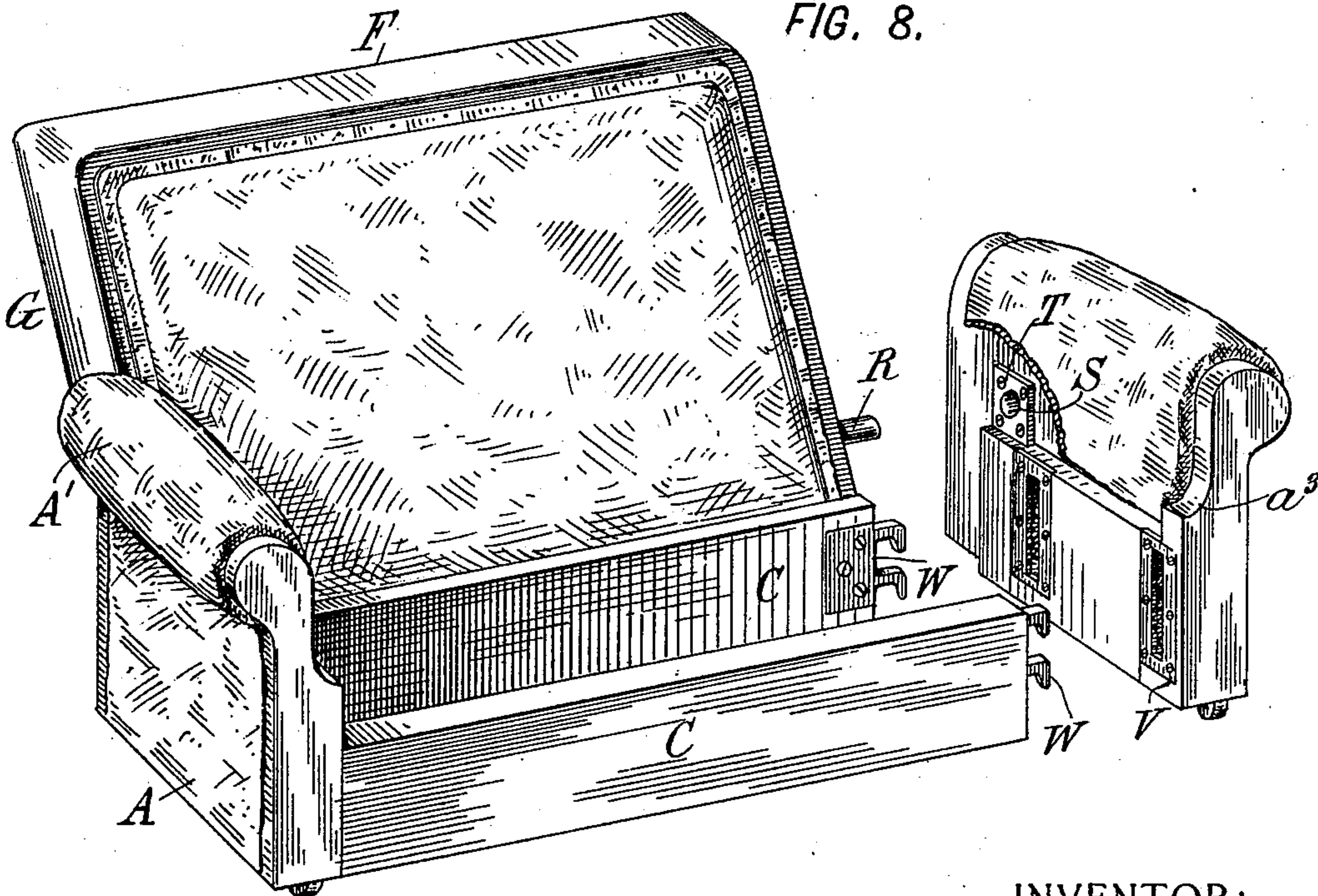


FIG. 8.



WITNESSES:

*W. A. Hanna*  
*Frederick White*

INVENTOR:

*Milan W. Hall,*

By Attorneys,

*Arthur T. Fraser & Co.*



# UNITED STATES PATENT OFFICE.

MILAN W. HALL, OF JERSEY CITY, NEW JERSEY, ASSIGNOR OF ONE-HALF  
TO HAROLD LOWENTHAL, OF NEW YORK, N. Y.

## FOLDING BED.

SPECIFICATION forming part of Letters Patent No. 667,439, dated February 5, 1901.

Application filed January 15, 1900. Serial No. 1,437. (No model.)

*To all whom it may concern:*

Be it known that I, MILAN W. HALL, a citizen of the United States, residing in Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Folding Beds, of which the following is a specification.

My invention provides a folding bed which is an improvement over existing types in simplicity of construction, ease of manipulation in use, appearance when out of use, and comfort when in use, and in other points which will be set forth in the following description of a practical embodiment thereof.

In the accompanying drawings, Figure 1 is a front elevation of a practical embodiment of my invention in the closed position; Fig. 2, a cross-section of the same in the closed position; Fig. 3, a front elevation of one end of the same in the open position—that is, when made up ready for sleeping in; Fig. 4, a longitudinal section of the opposite end thereof when in the same position as Fig. 3; Fig. 5, a detail, on a larger scale, of the latch and headboard; Fig. 6, an enlarged detail of the hinge for connecting the headboard to either of the end rails; Fig. 7, a plan showing the cover for holding the bed in its frame, and Fig. 8 a perspective illustrating one manner of separating or connecting the various parts.

In the embodiment of my invention which I have worked out in the greatest detail I provide a sofa, couch, lounge, or the like having a support preferably consisting of end pieces and a seat supported between the same, and a frame carried also by said support and adapted to stand in a substantially vertical position at the back of said seat, so as to form a back for said sofa, or in a horizontal position for use as a bed.

Referring to the drawings, A indicates the end pieces, which are preferably provided with upward extensions A', forming arms. These end pieces are somewhat wider than the end pieces of an ordinary sofa, and they carry rollers *a* at the front and *a'* at the rear. Supported between said end pieces and of less width than the same is a seat B. Said seat is supported immediately, as shown in Fig. 2, upon side rails C, running the entire length of the seat. Connecting said side rails at

their ends are a pair of end rails D. (Shown in Fig. 4.) A bottom E is also provided, making, with said side and end rails, a box, of which the seat B is a cover, being held thereon in any approved manner—as, for example, by the rabbets *b* at its sides and ends. In the form shown in Fig. 4 the seat is supported between the end pieces by screws or bolts *c*, passing through the head-rails of the seat and into the end pieces A. In the preferred construction an extra thickness of the end pieces is secured at the lower portion by the strip *a*<sup>2</sup>, which is fastened thereto. The box or seat described will be used ordinarily for receiving pillows, extra coverings, and the like.

As shown in Fig. 2, the end pieces extend backward farther than the seat or box, and on such extended portion is carried a frame composed of side rails F, end rails G, and a bottom H. The bottom H is finished on its outer face to correspond with the finish of the arms and the seat, either by upholstering, as shown in Fig. 8, or in any other desired manner. The inside of said frame is adapted to carry springs K, mattress L, and bed-clothes M, of the usual type. As an additional convenience I may provide a headboard N, adapted to be hinged to either of the end rails G, which are beveled, as shown in Fig. 5, for that purpose, and each of which is provided with half-hinges O, of which the headboard N is provided with the complementary half. To fasten said headboard to either end rail, the board is placed in position with its hinge-leaf fitting into the hinge-leaf on the end rail, and the spring-pin P, Fig. 6, is pushed into place. When out of use, the headboard is folded down into the full-line position of Fig. 5, and when in use rests in the position shown in Fig. 3 and in dotted lines in Fig. 5 against the arm A'.

The end rails are trunnioned, as shown in Fig. 2, at a point at one side of their center and approximately at their lower edge to the end pieces. The details of this trunnion are not part of my invention; but I have shown a pin R, adapted to rest in sockets S, which are protected from wear by a face-plate T. (Shown more clearly in Fig. 8.) The position of this trunnion is such that in the closed position the bed-frame is inclined slightly back-



ward, its weight tending to throw it still farther backward and this tendency being resisted by the bearing of the lower side rail F or of the shoe Q against the rear side rail C of the seat, while in the open position the trunnion is so far to one side of the center as to give considerable stability against the frame's swinging backward.

For the purpose of automatically pulling the bed out from the wall, and thereby preventing the scratching of the wall when the bed is being lowered for use, I provide mechanism connected with the bed-frame and adapted to force the same laterally a slight distance during the first portion of its swinging movement. The preferred means for doing this consists of a shoe or several shoes Q, fastened to the lower side rail F and of such a length as to just clear the floor-line when the bed-frame is in the position shown in Fig. 2. Preferably, also, this shoe is provided with a rubber tip *q* for increasing its friction against the floor or carpet. The first movement, when the bed-frame is oscillated toward the horizontal position, will bring the shoe Q into contact with the floor. The continuation of the movement will cause the trunnion R to rise, carrying with it the rear ends of the end pieces, and to swing horizontally about the end of the shoe Q as a center. The end pieces at the same time slide forward on the front rollers A, the rear rollers A' being off the floor. This movement continues until the trunnion R has moved a distance forward of the shoe equal to the distance which it was previously back of the shoe. The rear rollers of the end pieces will then rest on the floor again, and the entire structure will be stationary except for the continued rotation of the bed-frame about its trunnion. In returning from the horizontal to the upright position the reverse movement takes place, pushing the sofa or folded bed back into the position which it originally occupied.

For the purpose of preventing the finished surface of the bottom H of the bed-frame from coming in contact with the finished surface of the seat B, I provide stops *a*<sup>3</sup>, which in the present case preferably consist of lateral extensions at the front of the end pieces A and which receive the corners of the bed-frame and hold the same at the necessary elevation to prevent the finished surfaces coming in contact with each other. The excessive weight in the portion of the bed which overhangs the seat is so great that ordinarily no additional security will be necessary to prevent its swinging backward to the upright position; but for additional security I may use a latch of any approved type, which will project under the shorter side when the latter is in a horizontal position to prevent the same from being carried down by an excessive weight thereon. The particular latch which I have designed for the purpose is that shown in detail in Fig. 5, in which U is a weighted latch pivoted at *u* to the rear end

of one of the end pieces. This latch carries a tail U', and in its normal position when unengaged with the bed-frame the latch bears down on a pin *u'*. When the bed is lowered for use, the short end of the head-rail rises, pushing the latch over to the dotted and broken line position, the tail U' being thrown slightly forward, but not far enough to interfere with the movement of the end rail. If the bed-frame in rising should strike the latch suddenly, so as to tend to throw it to the opposite side of its pivot, the tail U', striking the end rail, would prevent this excessive movement. When the head-rail passes above the latch, the latter drops into the full-line position, which prevents the end rail from falling again. When the bed is to be closed up, the tail U' is thrown by hand over to the dotted-line position, so that the weight is carried to the opposite side of its pivot and the tail bears up against the under side of the stop *u'*. The bed may thus be closed up, but in so doing the end rail again strikes the tail U', throwing the latch over to its operative position, where it is ready for automatic action upon again lowering the bed. For the purpose of preventing the mattress, bedding, &c., from falling out of its frame in the position of Fig. 2 any of the similar devices now in use in folding beds may be used. Preferably I provide a cover Y of strong cloth reinforced at the edges with leather Z and having a row of buttonholes *y* along its opposite edges, and I provide the side rails with buttons *z* to correspond, the buttons being of any type in which the buttonholes may be easily slipped on and off the buttons. In practice the buttonholes along one side of the bed only would need to be slipped over the buttons, when the entire cover could be thrown over to the opposite side of the bed, so that in fact the cover might be even permanently fastened to one side of the bed, if desired, or it might be permanently fastened to both sides of the bed and divided in the middle, with appropriate means for fastening such middle edges.

Instead of fastening the box or seat board with the screws or bolts, (illustrated in Fig. 4,) I may use the ordinary fastenings for joining the side rails of a bed to the head and foot boards, as illustrated in Fig. 8. In this figure, V represents the plates fastened to the end pieces and having slots for the reception of hooks W, which are fastened to the side rails. Also, as shown in this figure, the end rails D of the box may be omitted, the end pieces A serving as the ends of the box, though obviously the fastenings V W and the end rails D could be used at the same time. The bottom E may be made separable from the side rails C, if desired. By this construction I provide a folding bed which can be taken apart with very little greater difficulty than ordinary beds. The bed being closed up into the position of Fig. 8 and the back resting against the wall, it is only necessary to



lift the side rails C slightly and draw out first one end piece and then the other, when all the parts are evidently separated. In this construction of course the seat B fits on the rails C in the same manner as in the construction shown in Fig. 2.

In the use of my improved bed the seat B will be lifted and the pillows taken out, the bed-frame will be swung down into its horizontal position, automatically locking itself into that position, the cover is released at one edge and thrown over to the other side, and the headboard (if one be found desirable) is swung upward and the pillows put in place, when the bed is ready for use. The swinging down of the bed-frame has drawn the bed out from the wall to the desired distance, either just sufficiently to clear the wall or so far as to leave room to walk between the wall and the bed. In putting up the bed it is made in the ordinary way except for the pillows, which are taken out, the head-piece is swung down, the cover fastened in place, the latch U thrown into its inoperative position, and the bed swung up, in the swinging-up movement forcing itself back against the wall and also resetting the latch U to its operative position. The pillows are then put into the box under the seat.

By making the rollers A A' simple rollers revolving only in the lateral direction I can secure a much more easily-running roller than those ordinarily used for bedsteads, which greatly facilitates the action of the shoe Q, though of course other rollers would serve the same purpose in a less perfect degree. The headboards N may also be dispensed with, as shown in Fig. 7, especially if the bed be a narrow one, so as not to extend very far on each side of the sofa-arms in the horizontal position. Any ordinary detachable hinged joint may be provided between the headboard and the end rails of the bed-frame.

While I have shown and described as the most complete form of my folding bed a sofa for supporting the same, there are many of the advantages of my bed which would be useful with any other form of support. Also, it is obvious that other latches, automatic or non-automatic, may be used in the place of the one which I have especially designed without seriously interfering with the usefulness of the bed. By extending the sofa back below the level of the seat I am enabled to lower the trunnions, so that the bed in its horizontal position will be as low as the sofa-seat permits, also to obtain a standard-size bed in a single piece, and to secure the necessary counterbalance to make the manipulation of the bed a comparatively easy matter. It will be understood, therefore, that though I have described my bed and the various details thereof with great particularity I do not limit myself specifically to the forms described, nor to the combinations of various parts described, such modifications in the details or in the rearrangement or elimination

of the various parts as are possible to the skilled constructor in this class of articles being all included within my invention.

What I claim, and desire to secure by Letters Patent, are the following-defined novel features, all substantially as set forth:

1. The combination in a folding bed of a support, and a bed-frame, sockets carried directly by one of said parts and trunnions carried directly by the other and held at a fixed point by said sockets, whereby said bed-frame is trunnioned on said support, said support being composed of relatively-fixed parts, and means for supporting said bed-frame on said support in both a vertical and a horizontal position.

2. The combination in a folding bed of a support, a bed-frame, sockets carried directly by one of said parts and trunnions carried directly by the other, whereby said frame is trunnioned on said support, and means carried entirely by said support in addition to said trunnions for supporting said bed-frame in a horizontal position, said means being operative automatically on turning said bed-frame to a horizontal position.

3. The combination in a folding bed of a support, a bed-frame trunnioned at a fixed point thereon and adapted to be oscillated from an approximately vertical position to a horizontal one, and means carried directly by said support on opposite sides of said trunnion for preventing rotation of said frame in either direction from a horizontal position.

4. The combination in a folding bed of a support, a bed-frame trunnioned thereon and adapted to be oscillated from an approximately vertical position to a horizontal one, and means carried directly by said support on opposite sides of said trunnion for automatically locking said bed-frame in a horizontal position.

5. The combination in a folding bed of a support adapted to rest directly upon the floor, a bed-frame trunnioned thereon, and mechanism controlled by the oscillation of said frame for producing a lateral movement of said support.

6. The combination in a folding bed of a support adapted to rest directly upon the floor, a bed-frame trunnioned thereon, and mechanism controlled by the oscillation of said frame for producing a vertical and lateral movement of said support.

7. The combination in a folding bed of a support, a bed-frame trunnioned thereon, the trunnion being at such a point that when in a vertical position the frame extends below the base of the support.

8. The combination in a folding bed of a support, a bed-frame trunnioned thereon, and a shoe connected to said bed-frame and adapted to bear on the floor when said frame is oscillated and thereby to produce a lateral movement of said trunnions.

9. The combination in a folding bed of a support comprising a seat and a pair of arms,



a frame trunnioned at a fixed point on said support, said trunnion being beyond one side of said seat and said frame being adapted to form, when in a substantially vertical position, a back for said seat, and the rear side of said frame being adapted to carry a bed, and means on said arms for supporting said frame in a horizontal position.

10. The combination in a folding bed of a support comprising a seat and a pair of arms, a frame trunnioned on said support, said trunnion being beyond one side of said seat, said frame adapted to form, when in a substantially vertical position, a back for said seat, and the other side of said frame being adapted to carry a bed, and means on said arms on both sides of said trunnions for supporting said frame in a horizontal position.

11. The combination in a folding bed of a pair of end pieces, a seat attachable to and detachable from said ends, and forming the sole connection between said ends, a bed-frame, and trunnions and trunnion-bearings for supporting said frame on said end pieces when said end pieces are attached to said seat, and whereby said frame is detached from said end pieces by the detachment of said end pieces from said seat.

12. The combination in a folding bed of a pair of end pieces, a pair of side rails attachable to and detachable from said end pieces, and a bed-frame, said frame being attachable to and detachable from said end pieces, and means whereby the attachment of said side rails to said end pieces locks said bed-frame to said end pieces.

13. The combination in a folding bed of a support, a bed-frame thereon, a catch adapted to lock said bed-frame in a horizontal position, means for throwing said catch out of operation, and means actuated by the movement of said bed-frame from its horizontal position for returning said catch into its operative position.

14. The combination in a folding bed of a support, a bed-frame trunnioned thereon and having a portion adapted to swing past the end of said support, a catch on said end, and an arm connected to said catch and adapted to be struck by said end on its downward movement to throw said catch into its operative position.

15. The combination in a folding bed of a support, a bed-frame trunnioned thereon and having a portion adapted to swing past one end of said support, and a catch on said end adapted in one position to permit the upward movement and to check the downward move-

ment of the adjacent portion of said frame, and in another position to permit the downward movement of said adjacent portion.

16. The combination in a folding bed of a support, a bed-frame trunnioned thereon and having a portion adapted to swing past one end of said support, and a catch on said end adapted in one position to permit the upward movement and to check the downward movement of the adjacent portion of said frame, and in another position to permit the downward movement of said adjacent portion, and means adapted to be actuated by said downward movement for throwing said catch into the first-mentioned position.

17. The combination in a folding bed of a support, a seat carried thereby, a frame trunnioned at a fixed point on said support, said trunnion being beyond the rear of said seat, said frame being adapted to form, when in a substantially vertical position, a back for said seat, and the rear side of said frame being adapted to carry a bed, and means entirely on said support for supporting said frame in a horizontal position with the bed-carrying side uppermost.

18. The combination in a folding bed of a support comprising a fixed seat and a pair of fixed end pieces, and a frame carried on said support, one side of said frame being adapted to form, with said support, a sofa or the like, and the other side of said frame being adapted to carry a bed, said frame being adapted to lie between said end pieces and to be carried entirely by said support when in a horizontal position, and means whereby said frame may be carried in a horizontal position by said support.

19. The combination in a folding bed of a support comprising a seat and a pair of end pieces, and a frame, trunnions and sockets carried directly by said frame and said support whereby the latter is trunnioned on said support at a fixed point at approximately the level of said seat, one side of said frame being adapted to form, with said support, a sofa or the like, and the other side of said frame being adapted to carry a bed, and means entirely on said support for carrying said frame in a horizontal position.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

MILAN W. HALL.

Witnesses:

D. A. USINA,  
FRED. WHITE.