

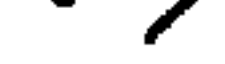
C. F. PERCIVAL.
 CONVERTIBLE SEAT AND BED.
 APPLICATION FILED APR. 27, 1909.

4 SHEETS—SHEET 1.



F. L. Sprague
R. M. Mowell

INVENTOR,

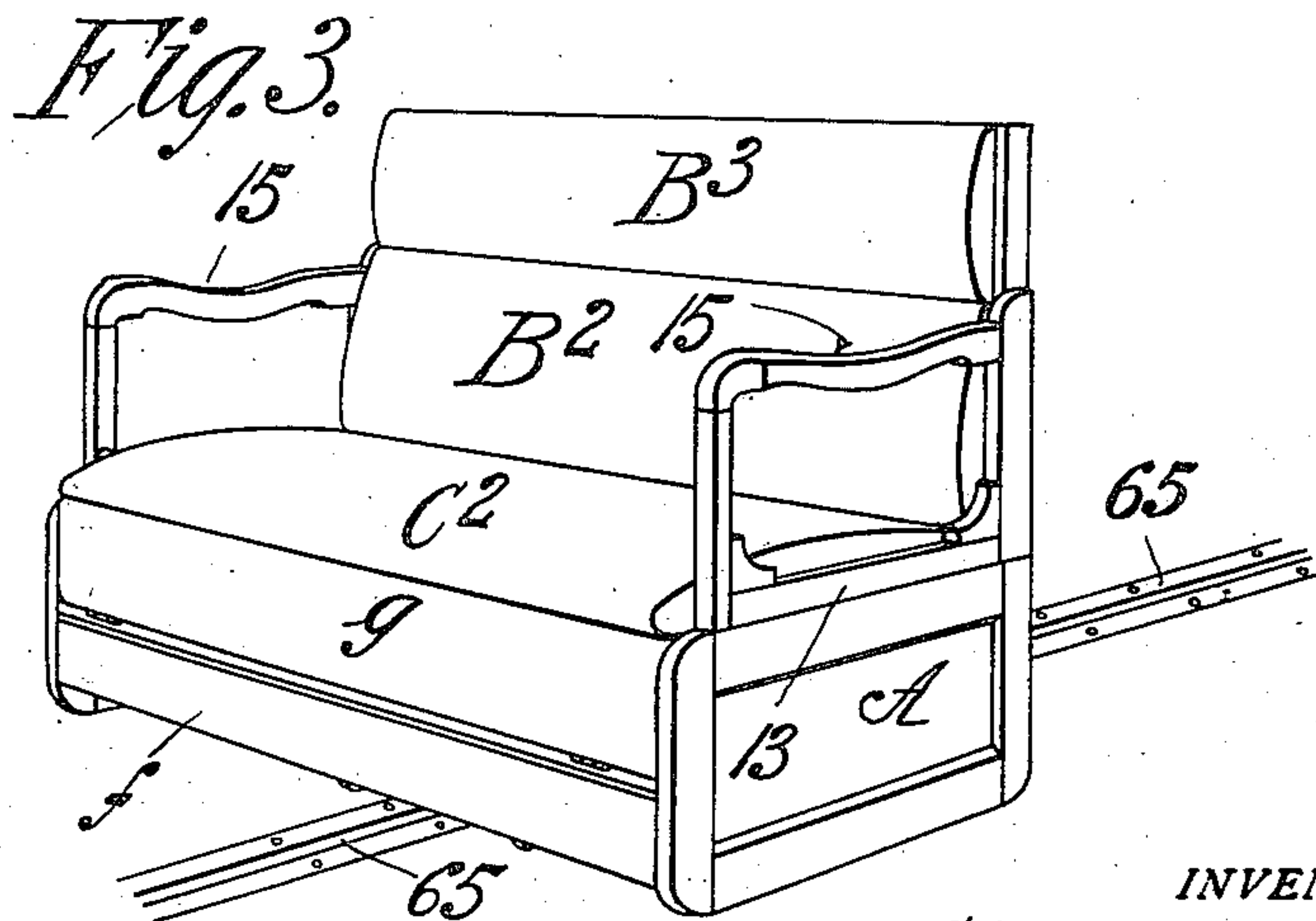
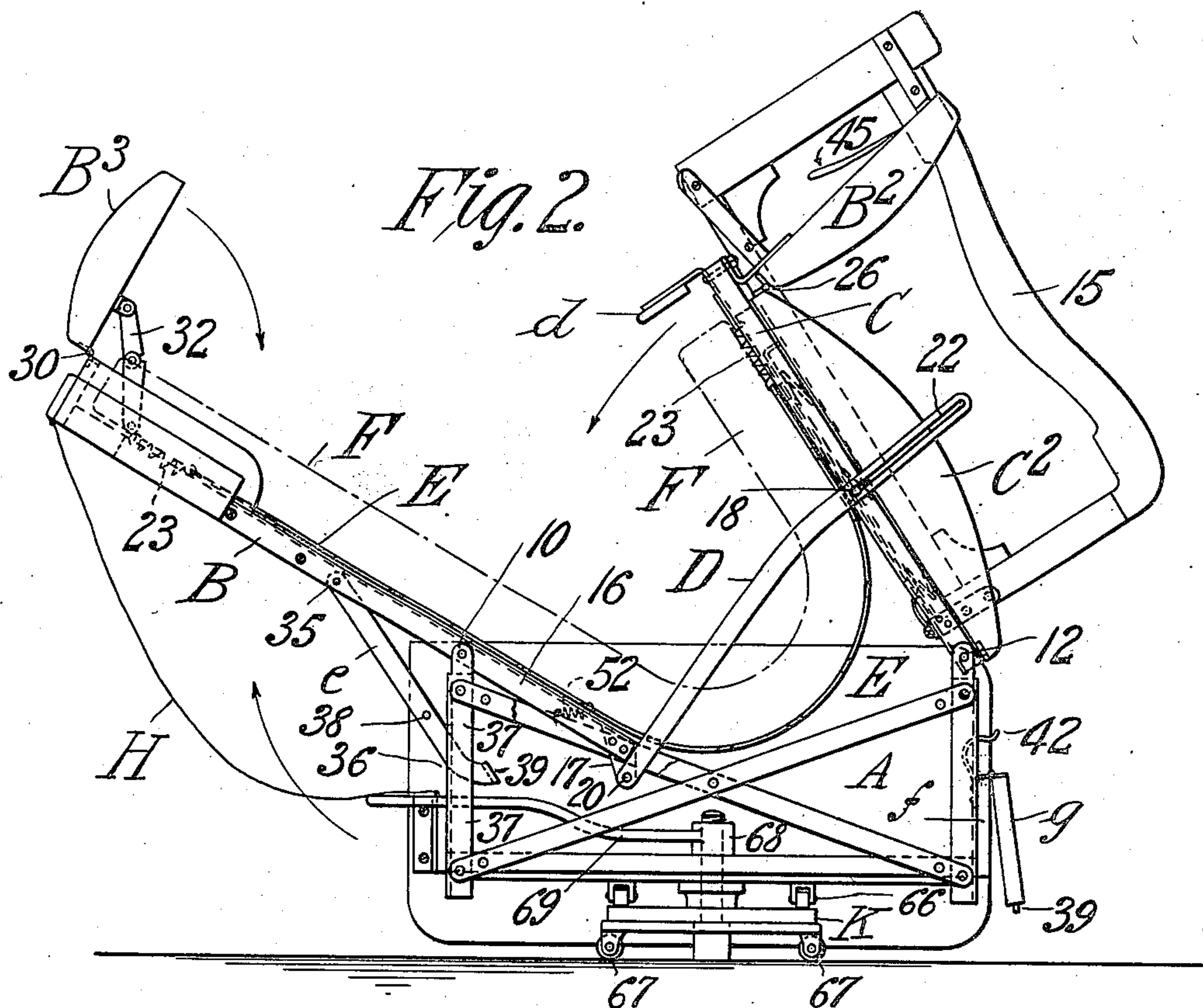
Chas. F. Percival,
BY 
ATTORNEY.

991,535.

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Patented May 9, 1911.

4 SHEETS—SHEET 2.



WITNESSES:

H. L. Sprague
R. M. Mowry

INVENTOR,

Chas. F. Percival,

BY

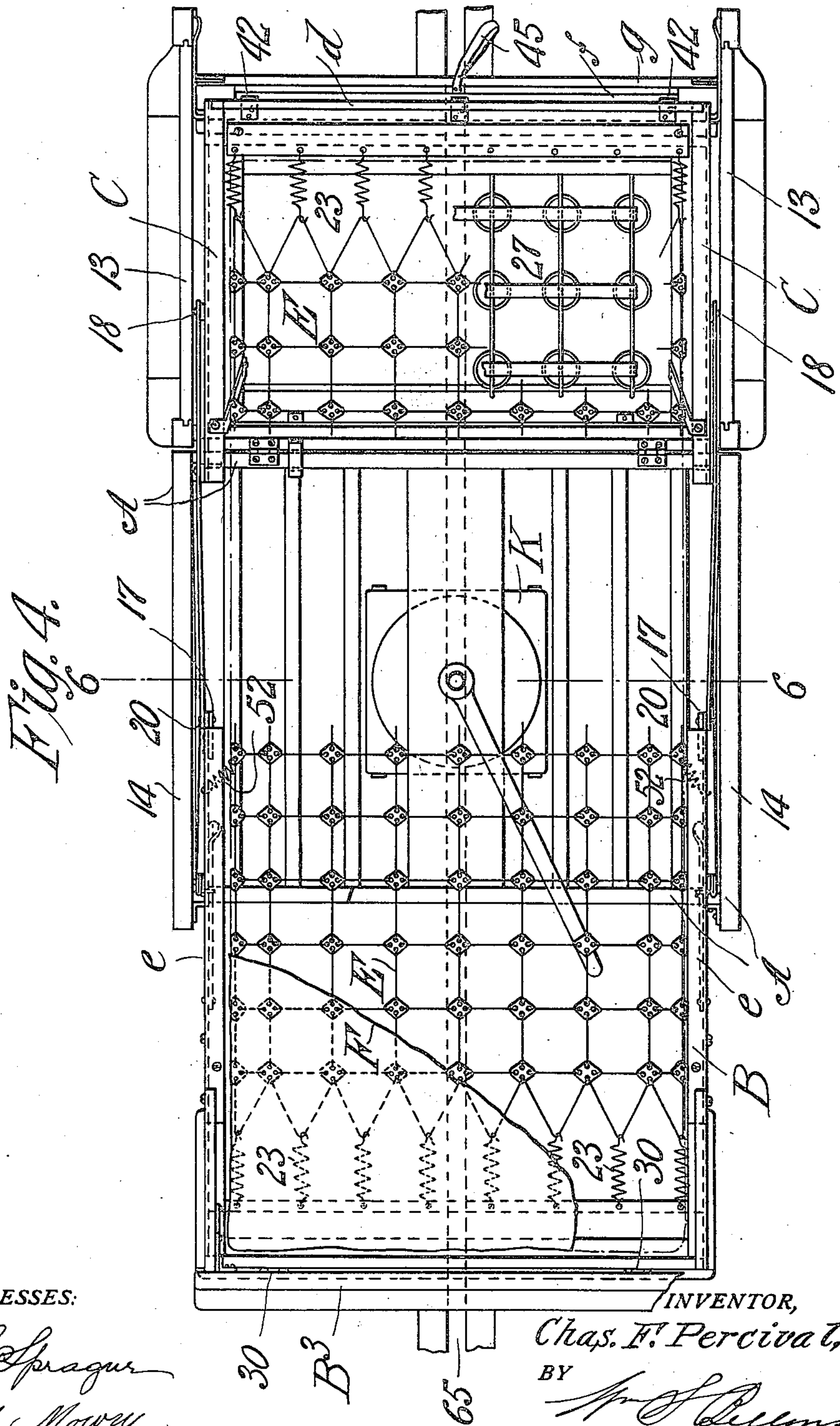
W. J. Bell
 ATTORNEY.

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4 SHEETS—SHEET 3.



WITNESSES:

H. L. Sprague
P. M. Moray

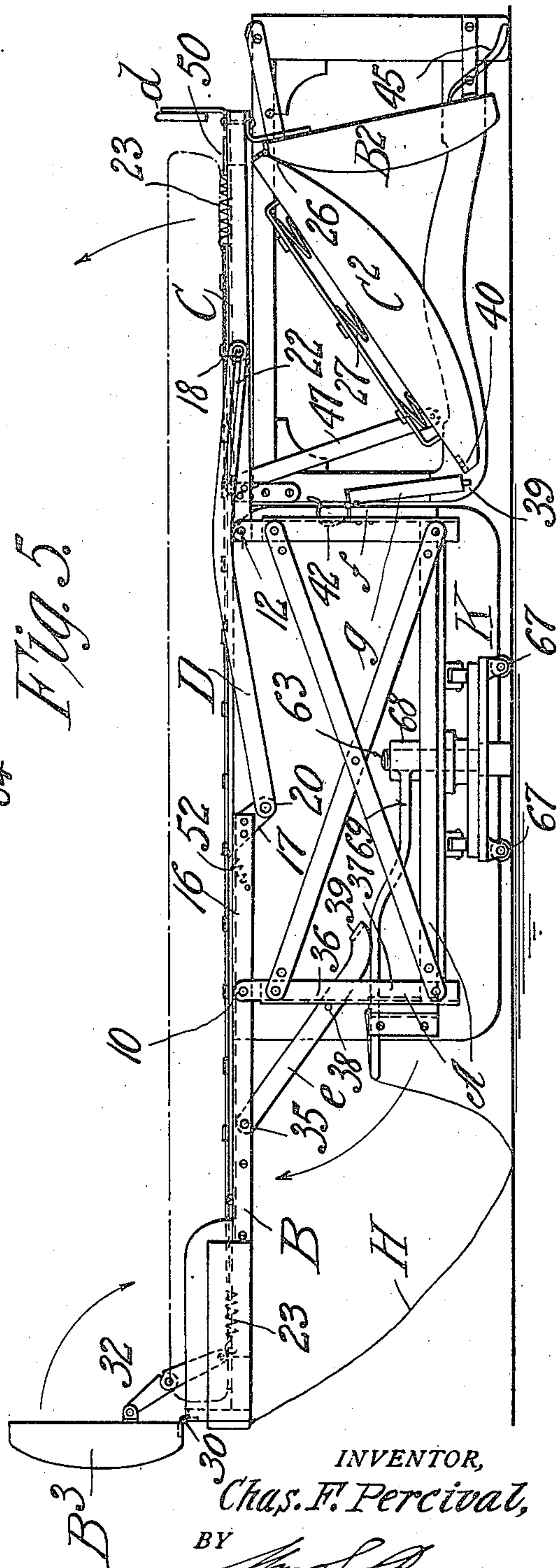
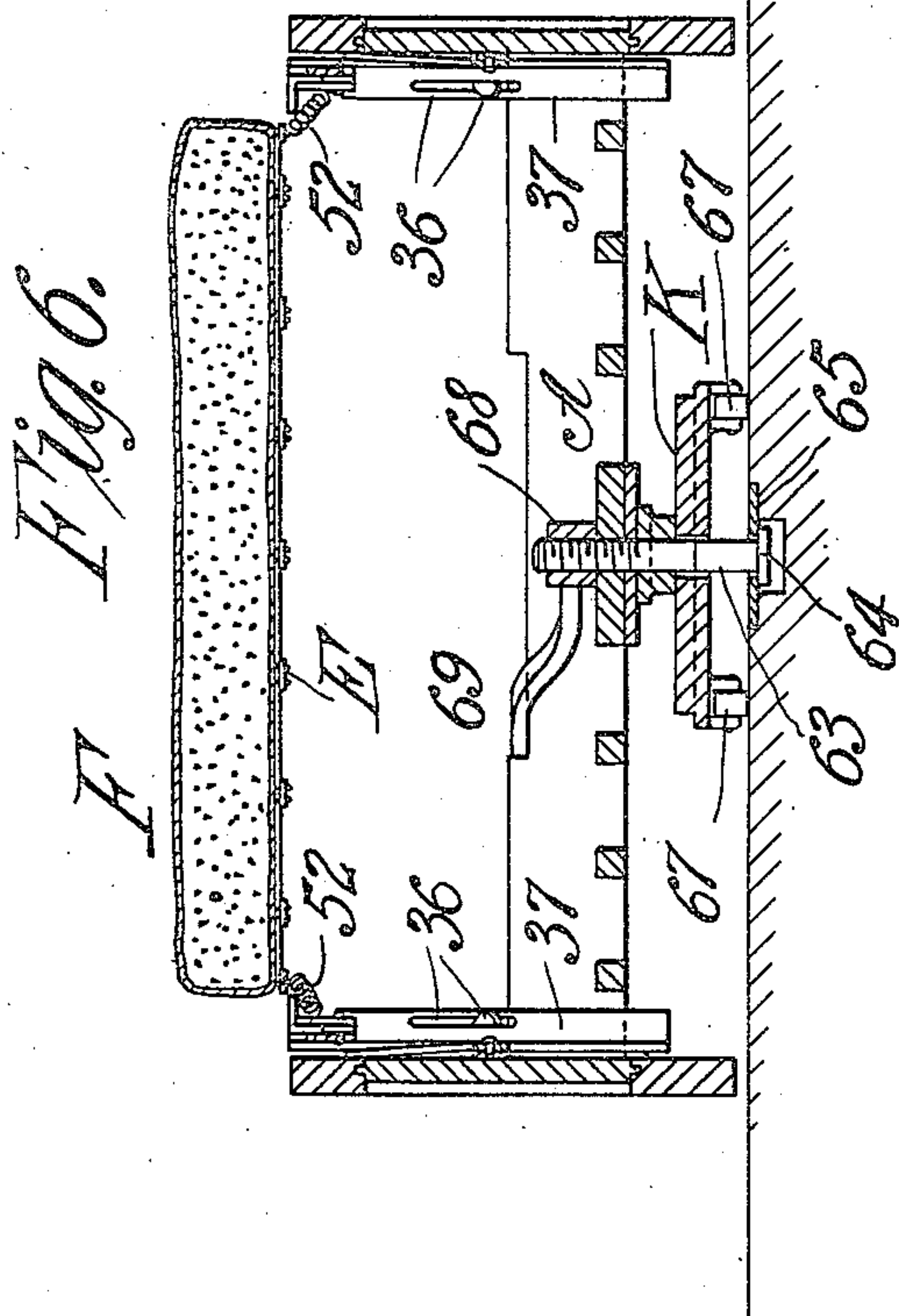
INVENTOR,
Chas. F. Percival,
BY *[Signature]*
ATTORNEY.

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4 SHEETS—SHEET 4.



WITNESSES:

H. L. Sprague
 R. M. Mooney

INVENTOR,
 Chas. F. Percival,
 BY
 J. S. Cullen
 ATTORNEY.

UNITED STATES PATENT OFFICE.

CHARLES F. PERCIVAL, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO SIMPSON CLARK, OF SPRINGFIELD, MASSACHUSETTS.

CONVERTIBLE SEAT AND BED.

991,535.

Specification of Letters Patent.

Patented May 9, 1911.

Application filed April 27, 1909. Serial No. 492,524.

To all whom it may concern:

Be it known that I, CHARLES F. PERCIVAL, a citizen of the United States of America, and resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Convertible Seats and Beds, of which the following is a full, clear, and exact description.

10 This invention relates to a convertible seat and bed of a kind comprising a main, supporting frame, a normally vertical back frame hinged to the rear upper part of the main frame, a seat frame hinged to the forward portion of and normally supported horizontally on the main frame, said seat and main frames carrying an elastic or other suitable mattress support, the ends of which are connected to such frames, both said
15 20 frames being adapted to be swung to and supported in horizontal positions for converting what was normally a seat, divan, or couch, to a bed.

One object of the invention is to provide in conjunction with the main frame and the back frame and seat frame hinged thereto, improved means for securing the downturn-
25 ing to horizontal position of the back frame on an overturning to an extended horizontal position of the seat frame.

Another object is to combine and arrange in conjunction with the main frame, back frame and seat frame, supplemental frames for constituting attractive and comfortable
35 upholstery or cushioned backs and seats for the piece of furniture when used as a couch, divan, or the like.

Another object is to so combine and arrange the frames and appliances which constitute the seat and bed that when the parts are restored from bed forming condition to seat forming condition, the mattress carried by the mattress supporting fabric may be disposed in a partially folded up condition and
45 concealed from view within the seat and a space within the main frame of the seat left available for the reception therein of articles of bedding such as pillows, sheets and blankets.

50 Other objects and advantages are attained in and by the particular organization or combination of the parts as will hereinafter appear. And the invention consists in the combination or arrangement of parts and the

construction of certain of the parts all substantially as hereinafter described in conjunction with the accompanying drawings and covered by the claims.

In the drawings,—Figure 1 is an end elevation of the convertible seat and bed with the parts thereof shown as in their "normal" or seat constituting relations, portions of the end framing being understood as removed in order to disclose the operative parts of the structure. Fig. 2 is a view similar to Fig. 1 but showing relations of the parts in partially opened to bed forming condition. Fig. 3 is a perspective view to indicate the aspect of the piece when the parts thereof are compacted as a seat or divan. Fig. 4 is a plan view of the piece of furniture shown as fully opened out or extended, as a bed. Fig. 5 is an elevation in series with Figs. 1 and 2, but showing the parts in the fully opened and extended condition. Fig. 6 is a vertical cross section on line 6—6, Fig. 4.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings,—A represents the main, supporting frame for the piece of furniture which will be described with reference to its condition as a seat as the normal condition, terms of relation, dimension and direction as herein (arbitrarily) employed, being consistent as in respect of the piece in its primary aspect as the seat or divan. The said main supporting frame or structure A is of a rectangular more or less box-like shape, upwardly open, of a width corresponding to the width of the seat or divan and of a length which is not only suitable for the length of a divan but also one which corresponds to the required width of the bed.

B represents a substantially normally vertical back frame proper, the same being pivotally connected at its lower edge by the hinges or pivots 10 to the rear upper portion of the main supporting frame.

C represents the seat frame proper connected by the pivots or hinges 12 to the forward upper portion of the main frame A, the same being normally horizontal and disposed horizontally relatively to the upper part of the main frame and, when it is in its normal position, it receives support on the main frame by the rigidly connected end pieces 13, 13, shown in Figs. 3 and 4 which extend over and engage in the manner of

shelf or ledge-like members on the upper edges of the main frame end boards 14, 14. The said end pieces 13, as shown in Fig. 3, are made with the arms 15, 15, which are in effect rigid right angularly extended appurtenances of the seat frame proper C.

The back frame B has at its ends duplicated arms 16 which are extended downwardly beyond the hinge axis at 10, their
10 extremities being rearwardly offset as shown at 17.

The seat frame proper C has a stud 18 projecting outwardly beyond each of its ends at a point between its hinged and its
15 free edges; and a link D which is of a slightly obtuse angular form is by pivot 20 connected to the extremity of the arm or extension 16 of the back frame; and the said link (which is duplicated at opposite ends of
20 the apparatus) has a comparatively long slot 22 in its forward portion through which the stud 18 at the end of the seat frame proper engages,—it being understood that
25 each said stud is provided with a head or enlargement closely outside of the link for preventing the accidental disengagement of the slotted link from its relation for lost-motion play lengthwise of the stud.

E represents a mattress supporting fabric,
30 which may be of any suitable one of the many kinds employed in corresponding situations, that here shown consisting of interconnected links and plates with spiral springs 23 at the opposite ends which have attach-
35 ments with the upper part of the back frame proper and with the normally rearward part of the seat frame proper; and such mattress supporting fabric, being elastic, has a stretching action imparted thereto when the
40 frames B and C to which it is connected are horizontally extended; and as shown in Fig. 1 and in a manner in Fig. 2, this mattress supporting fabric E and the mattress F, supported thereon, and usually "stayed" or
45 detachably connected thereto, after the parts are arranged as the seat have an approximately right angular bend at the base of the back and a return bend or fold under the seat, and somewhat to the rear of the front
50 of the apparatus, to leave space for occupancy within the front portion of the main frame of the pillows, 25 or bedding or both.

The normally horizontal seat frame C has rigidly connected therewith a normally, ap-
55 proximately vertical, supplemental back frame B² which occupies a position in front of the back frame proper when the latter is in its normal substantially vertical position,—this supplemental back frame B²
60 which is bodily carried by the seat frame proper, being cushioned or upholstered, has pivotally connected by the hinges 26 the normally horizontal supplemental or upholstered seat frame C², the upholstery springs
65 of which are represented at 27 in Figs. 4 and

5. The back frame proper B has, furthermore, a frame (upholstered) indicated by B³ connected by the hinge 30 at its upper edge, this frame B³ being foldable facewise at its front, and adapted at such time to
70 make a second supplemental back frame disposed as an upward extension of the supplemental back frame B² and also adapted to be swung to a right angular position when the
75 parts are extended for a bed as shown in Figs. 2 and 5 and held in such position by the toggle like brace 32,—such supplemental back frame or member B³ constituting a head board for the bed.

The seat frame proper C has at its nor-
80 mally rear edge a rigid depending right angularly disposed member or board *d* which makes a foot board when the parts are extended as a bed.

The back frame proper has at its each end
85 an arm *e* extending downwardly below its pivot 35, by which it is connected to the frame, each said bar being movable through a slot 36 in a fixed upright portion 37 of the main frame. Each of these bars *e* has a pin
90 or stud 38 affixed thereto in suitable position, as shown, and understood as projecting both outwardly and inwardly from the faces of the bar, and serving when the back frame is swung down to the horizontal position
95 shown in Fig. 5 to engage the vertical side of the frame member 37 at either side of the slot and operate as a stop for the bar *e* which in the position last mentioned has become a brace for supporting the downswung and
100 horizontally disposed back frame proper.

The extremity of each bar is angularly turned to constitute a lug 39 to serve as a stop against the opposite face of the slotted frame member from that engaged by the
105 stop stud for preventing disengagement of the bar from its proper sliding relation to the frame member and also to serve as a means for preventing the back frame from swinging forwardly beyond its proper ap-
110 proximately vertical position when the apparatus is arranged as a seat.

The main supporting frame A includes at a lower portion of its front an affixed board
115 *f* in a vertical plane and extending from end to end of the frame; and hinged by its lower edge to the upper edge of said board *f* is another board *g* which when swung up to the vertical position shown in Figs. 1 and 3, insures an inclosed front to the seat. This
120 hinged front board *g* has one or more dowels 39 extended from its free upper edge which when the parts have their relation as a seat engage into sockets 40 in the bottom of the forward portion of the supplemental seat
125 section C² which shelves over or overhangs the front of the structure.

The spring 42 exerts by its reaction a force to throw the front board forwardly so that
130 it may then gravitatively swing downwardly

so soon as the supplemental seat section is slightly raised by being upwardly swung from its hinged connection with the supplemental back frame B². The said hinge board by its dowel and socket connection with the supplemental seat frame serves as a lock for holding all of the parts of the apparatus in their set up condition as a seat and preventing except by purposed and intelligently directed manipulation the opening up of the parts.

The parts being in what is herein stated as the normal position, Fig. 1, preparatory to opening up and extending the parts to make a bed, the supplemental seat section C² is upwardly swung sufficiently to release the engagement therewith of the closing front board *g* which is thrust forwardly and downwardly; the member B³ which is hinged to the upper edge of the back frame proper which constitutes normally one of the supplemental cushioned back frames for the seat is swung to its position right angular to the back frame and held in such position by the straightening out of the toggle-like braces 32.

The opening up of the supplemental frame B³ leaves the way clear for the person to reach behind the supplemental back frame B² which, as before stated, is rigidly carried by the seat frame proper C, whereupon the strap or handle 45 may be grasped and drawn upon to swing the seat frame proper to its overturned position carrying with it the supplemental back frame B² and the supplemental seat frame C² hinge-connected to such frame B².

The seat frame proper C may have a considerable swinging movement, that is one sufficiently far to carry it approximately to the vertical position before it becomes effective, through the duplicated connecting links D, to secure swinging movements of the back frame proper, as occasioned by the lost motion which the studs 18 of the seat frame may have relatively to the links while moving through the slots 22 in the latter, and until the outer closed ends of the slots are reached by such studs; and after the seat frame proper and parts bodily carried thereby have been swung through about 90 degrees, the seat frame studs 18 then become effective for a pulling action on the links which in turn operate on the lever-like arms 16 of the back frame and force the latter to its horizontal position, as limited by the stops 38 before mentioned, the back frame acquiring this horizontal position concurrently with the acquirement of horizontal position by the seat frame proper. And when the parts are opened out to extended bed-constituting relations, the supplemental seat frame may swing on the hinge which connects it to the supplemental back frame B² to the position represented in Fig. 5, and as limited by the flexible strap 47.

The links D are made of obtuse angular form for easy motions in the play of their slotted parts relatively to the seat frame studs 18; and also so that when the parts assume fully opened out conditions the more or less bow-like links may be free and clear from the pivots 12 which connect the supplemental seat frame to the main frame; and the articulation of the parts is such that when the frames are in their extended and opened out relations the elastic mattress supporting fabric will be somewhat stretched and under tension; but in order that there may not be imposed, by the mattress supporting fabric when the parts are being opened up, a counter stress on the back frame, which will have a tendency to force it toward its normal vertical position rather than toward its extended horizontal position, connections are provided at 52 to intercept the stretching strain of the mattress support at a point forward of the pivotal connection 10 of the back frame proper with the main frame; and in the present instance these strain intercepting stops or connections are constituted by comparatively strong or heavy spiral springs which are connected to, and diagonally extended between, side portions of the mattress support and the main frame A.

H represents a wide and sufficiently long cloth secured at its upper and lower ends respectively to the top of the back frame proper and a part of the main frame, and forming a closure for the back of the piece of furniture so that when seen as a chair the back inclosing fabric will be taut and slightly,—the same in its slackened condition when the parts are distended as a bed being practically concealed from view.

The main frame A of each convertible seat bed is mounted to swivel on a carriage K, such carriage having as an appurtenance thereto a central stud 63, both above and below it, the stud at its lower end having an enlargement or T-head 64 and engaging in a slotted trackway 65.

The main frame A has rollers or casters 66 whereby it has an easy running support for its revoluble movements around on the carriage K; and the carriage K has rollers or casters 67 whereby it easily runs back and forth in a straight line on the car floor.

The stud 63 has the upper portion thereof which protrudes upwardly through a member of the main frame A, screw threaded and receives thereon a nut 68 which is provided with a lever handle 69 by means of which the nut may be conveniently turned for locking the seat as a whole to the carriage K or freeing it relatively to the latter so that it may revolve one-quarter, or a full one-half, way around thereon.

On reference to Fig. 2, the arrows indi-

cate the directions of movements of parts when the same are being returned from bed-constituting relations to the normal seat-constituting relations, and in the closing up of the parts those carried by the seat frame proper will be swung through approximately 90 degrees before becoming effective, by reason of the length of link slots, to exert the lever-like effect on the back frame to move it to its vertical position.

I claim:—

1. In a convertible lounge and bed, in combination, a main supporting frame, a normally vertical back-frame-proper hinged at its lower portion to the rear upper portion of the main frame, a seat-frame-proper hinged to the forward portion of the main frame, normally horizontally superimposed thereon and having rigidly connected thereon with an approximately vertical supplemental back frame normally occupying a position in front of the back-frame-proper, a normally horizontal supplemental seat-frame, hinge-connected at its rear portion to the lower portion of said supplemental back-frame, means operating between the seat-frame-proper and the back-frame-proper for causing, on the overturning of the former a downswinging to horizontal position of the latter and an inversion of the supplemental seat frame, and a flexible strap connected to the seat-frame-proper and the supplemental seat-frame for limiting the downswinging movement of the latter.

2. In a convertible lounge and bed, in combination, a main supporting frame, a normally vertical back-frame-proper hinged at its lower portion to the rear upper portion of the main frame, and having, hinge-connected to its upper portion, and normally facewise disposed at the front of such upper portion a horizontal lengthwise extending member, a toggle-like and foldable brace connecting said member and the back-frame, a seat-frame-proper hinged to the forward portion of the main frame, normally horizontally superimposed thereon and having rigidly connected therewith an approximately vertical supplemental back frame occupying a position in front of the back frame proper, a normally horizontal supplemental seat frame hinge-connected at its rear portion to the lower portion of said supplemental back frame, means operating between the seat-frame-proper and the back-frame-proper for causing, on the overturning of the former a downswinging to horizontal position of the latter.

3. In a convertible lounge and bed, in combination, a main supporting frame, a normally vertical back-frame-proper hinged at its lower portion to the rear upper portion of the main frame, a seat-frame-proper hinged to the forward portion of the main frame, normally horizontally superimposed

thereon, having at its rear edge a depending horizontally and longitudinally ranging foot board member, said seat frame also having rigidly connected therewith an approximately vertical supplemental back frame occupying a position in front of the back-frame-proper and a normally horizontal supplemental seat frame hinged at its rear portion to the lower portion of said supplemental-back-frame, and means operating between the seat-frame-proper and the back-frame-proper for causing, on the overturning of the former, a moving to rearwardly extended horizontal position of the latter.

4. In a convertible lounge and bed, in combination, a main supporting frame, a normally vertical back-frame-proper hinged at its lower portion to the rear upper portion of the main frame having hinged to and normally facewise in front of its upper portion a head board section, and means for confining such section in a position right angular to the back frame proper, a seat-frame-proper hinged to the forward portion of the main frame, normally horizontally superimposed thereon having at its rear edge a depending horizontally and longitudinally ranging foot board member, said seat frame also having rigidly connected therewith an approximately vertical supplemental back frame occupying a position in front of the back-frame-proper, and a normally horizontal supplemental seat frame hinged at its rear portion to the lower portion of said supplemental-back-frame, and means operating between the seat-frame-proper and the back-frame-proper for causing, on the overturning of the former a moving to rearwardly extended horizontal position of the latter.

5. In a convertible lounge and bed, in combination, a main, supporting, frame comprising end uprights, having vertical slots therein, a normally vertical back frame, hinged to the rear upper portion of the main frame, and a seat frame hinged to a forward portion of the main frame and normally horizontal and superimposed thereon, the said back frame having at its side an arm extending downwardly beyond its pivotal connection with the main frame, a link connected to the extremity of said arm and having an engagement with a lateral portion of the seat frame whereby on the overturning of the latter to a horizontally extended position forward of the main frame the back frame will, through said link, be swung to a position horizontally extended beyond the rear of the seat frame, and bars pivotally connected to the ends of the back-frame movable through said slots in said main frame uprights, having transverse stops intermediately of their lengths for engagement with the latter for preventing downswinging of the back frame below its proper

horizontal position and having end stops for preventing their disengagements from said frame uprights.

6. In a convertible lounge and bed, in combination, a main frame having at its front a longitudinally extending hinge connected board for opening and closing the front of such frame, a back-frame-proper hinged at the rear part of the main-frame, a seat-frame-proper hinged to the front part of the main frame and having a supplemental back frame rigidly connected thereto and normally facewise in front of the

back-frame-proper, a supplemental seat frame which by its rear edge is hinge connected to the lower edge portion of the supplemental back frame, said hinged board and the seat frame having the one a socket and the other a dowel for engagement in said socket. 15 20

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

CHARLES F. PERCIVAL.

Witnesses:

WM. S. BELLOWS,

G. R. DRISCOLL.