

No. 611,647.

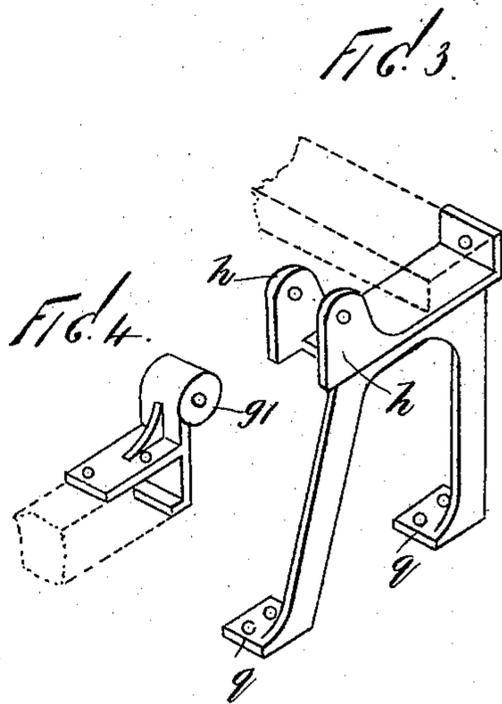
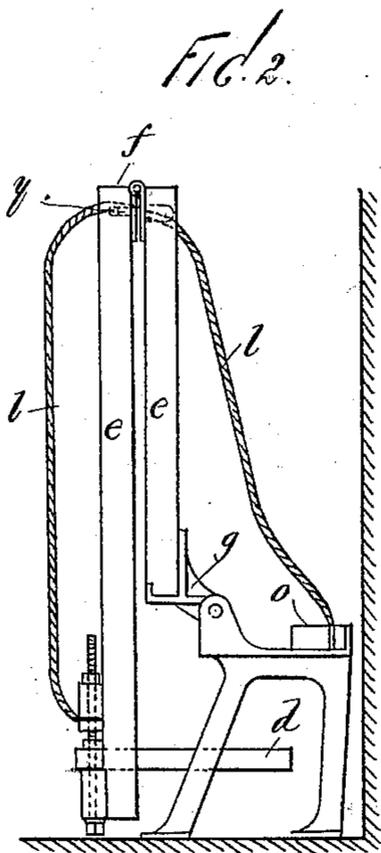
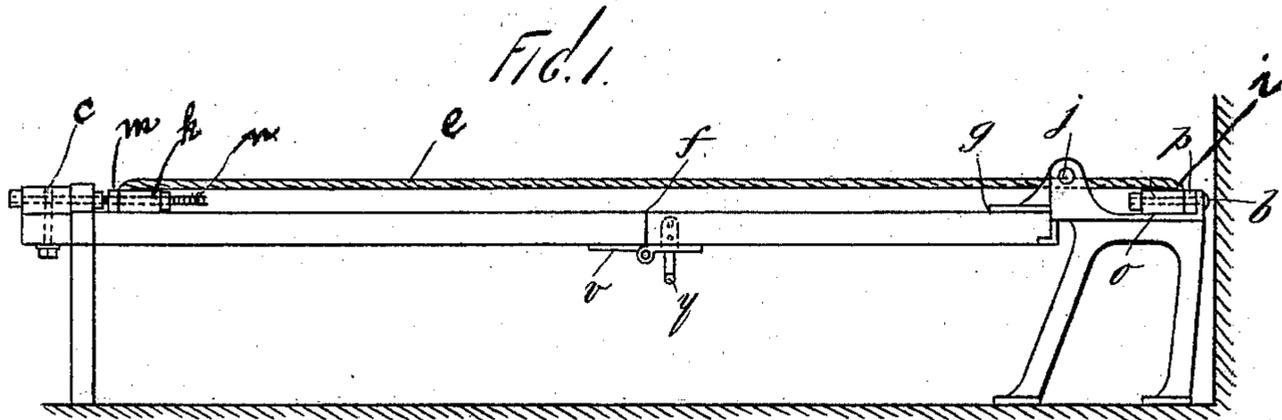
Patented Oct. 4, 1898.

J. D. RICHARDSON & F. H. YOUNG.
FOLDING MATTRESS, BED, AND SEAT.

(Application filed Dec. 21, 1897.)

(No Model.)

4 Sheets—Sheet 1.



WITNESS
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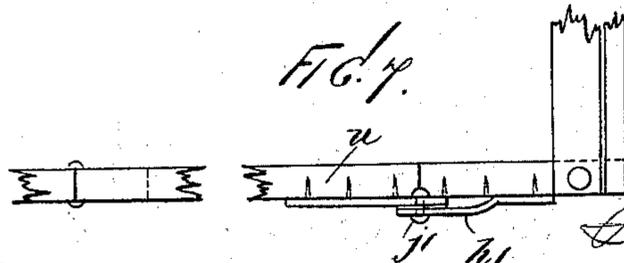
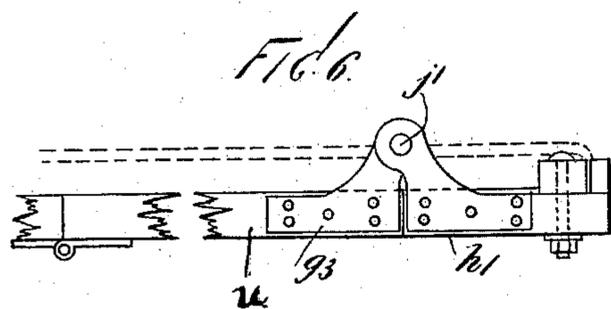
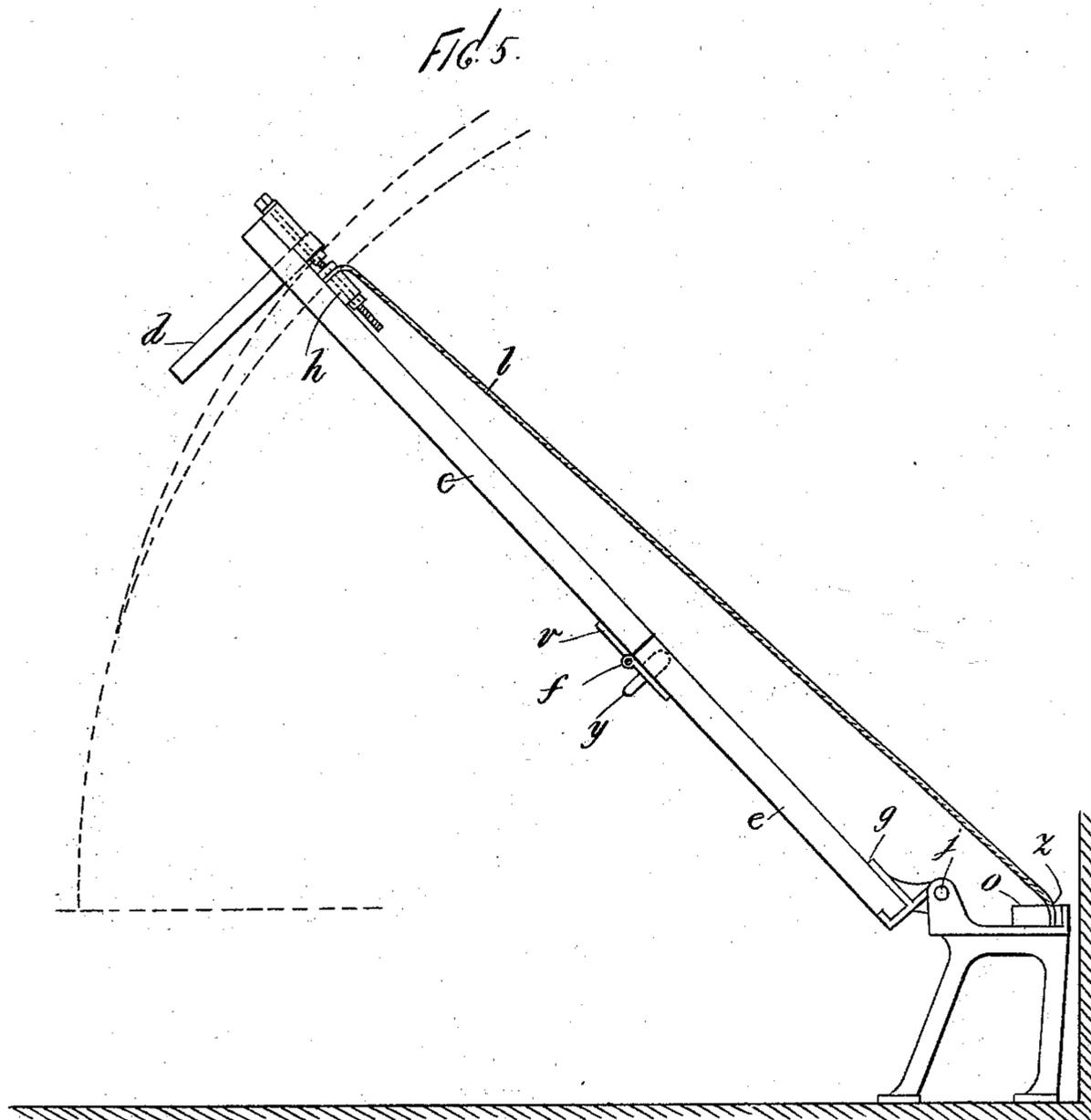
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4 Sheets—Sheet 2.



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FIG. 8.

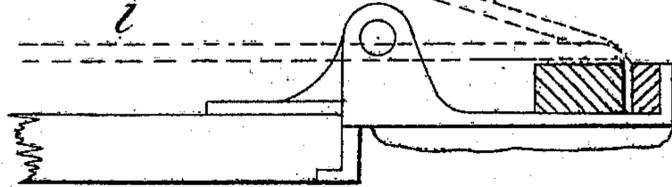


FIG. 9.

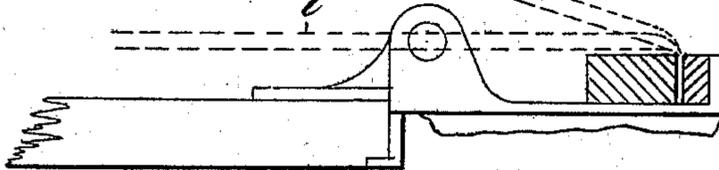


FIG. 10.

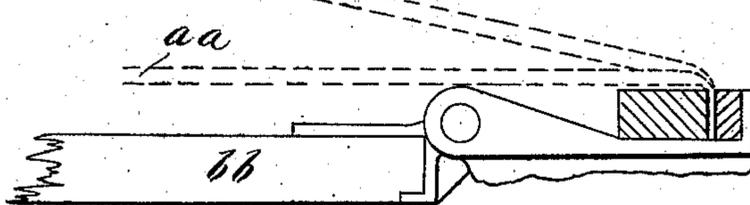
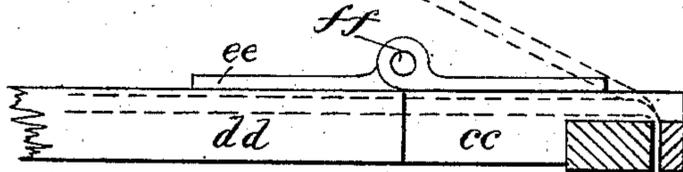


FIG. 11.



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FIG. 12.

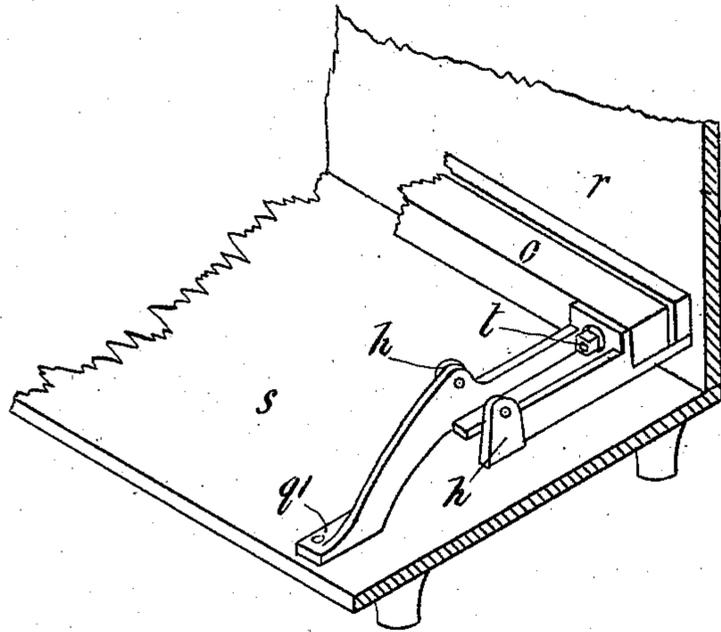


FIG. 13.

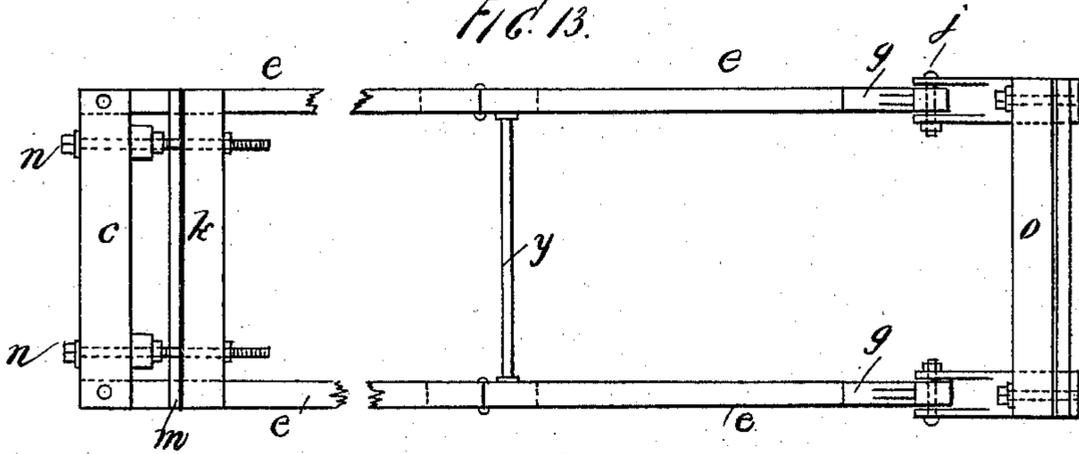
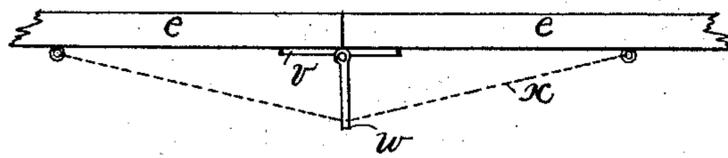


FIG. 14.



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UNITED STATES PATENT OFFICE.

JAMES DOUGLAS RICHARDSON, OF NEWCASTLE-UPON-TYNE, AND
FREDERICK HENRY YOUNG, OF BIRMINGHAM, ENGLAND.

FOLDING MATTRESS, BED, AND SEAT.

SPECIFICATION forming part of Letters Patent No. 611,647, dated October 4, 1898.

Application filed December 21, 1897. Serial No. 662,934. (No model.) Patented in England April 8, 1896, No. 7,433.

To all whom it may concern:

Be it known that we, JAMES DOUGLAS RICHARDSON, residing at Newcastle-upon-Tyne, in the county of Northumberland, and FREDERICK HENRY YOUNG, residing at Birmingham, in the county of Warwick, England, subjects of the Queen of Great Britain, have invented certain new and useful Improvements in Folding Mattresses, Beds, and Seats, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in folding mattresses, beds, and seats, and is the same as that for which Letters Patent were granted in Great Britain April 8, 1896, No. 7,433; and the object of said invention is to produce a folding mattress out of flexible wire-netting, canvas, or other equivalent yielding substance, connected with a frame, said mattress and frame being so connected that the frame and mattress can be utilized as a bedstead on which to place the usual sleeping-clothes, or the mattress and frame can form a folding chair or a folding fixed seat, in either case the stretched mattress or seat part to be folded with its frame into a vertical position, occupying but a small space, and as quickly unfolded into a horizontal stretched or extended position ready for use.

Our invention is suitable for use under several modifications or forms and is fully disclosed in the following specification, of which the accompanying drawings form a part, in which similar letters of reference designate the same parts throughout the several views, and in which—

Figure 1 represents a side elevation of mattress lowered into its extended position ready for use. Fig. 2 represents a side elevation of mattress in its folded-up position. Fig. 3 represents an isometrical view of combined legs and shoe, the legs supporting the shoe and the shoe carrying the mattress head-rail. Fig. 4 represents an isometrical view of side-rail hinge-bracket. Fig. 5 represents a side elevation of mattress and frame at that point in its radial path when the slack of wire mesh is taken up and the tension about to be exerted on the mesh. Fig. 6 represents a broken side view of mattress fitted with a hinged

bracket taking flat onto the surface of side rail. Fig. 7 represents a plan view of Fig. 6. Fig. 8 represents an enlarged elevation showing a shoe part similar to the upper part of Fig. 4 connected to a hinge-bracket, the center of which is situated above the mattress and side rails. Fig. 9 represents similar parts to those shown in Fig. 8, excepting that the center of the mattress edge is lineable with the center of hinge. Fig. 10 represents similar parts to those shown at Fig. 8, excepting that the center of hinge-bracket is below the wire mesh. Fig. 11 represents a mattress and frame radiating on a hinge secured over the mattress side rails. Fig. 12 represents an isometrical view of shoe with one short leg, such shoe being secured inside a movable cabinet. Fig. 13 represents a plan view of Fig. 1, and Fig. 14 represents the central joint of side rail strutted by means of a hinge with strut-piece and chain.

In carrying out the first modification of our invention we provide two vertical head-posts, and we prefer to form each of said head-posts in the shape of a bracket, with two short legs supporting a short horizontal supplementary side rail forming a shoe, and two of such structures, as shown in Fig. 3, are utilized to support the folding mattress, and such structures are connected together by means of a horizontal mattress head-rail secured to the shoe part by means of connecting-pins. We next provide a folding part which consists of a horizontal foot-rail, supported by two short posts, connected to two side rails of any suitable length, and such side rails may be joined in one or more places; but we prefer to make one folding joint only, as shown at *f*.

The head end of each folding side rail is secured to a hinge-bracket, as shown in detail in Fig. 4, and as shown at *g*, Figs. 1, 2, 5, and 13, and the main side rails are next pivoted to the supplementary side rails by passing the boss part *g'* of the hinge-bracket between the cheeks *h* of the shoe, and a pivot-pin *j* is passed through one cheek *h*, thence through the boss *g'*, and out through the other cheek *h*.

The folding frame, constructed as hereinbefore described, could be folded up in a vertical position to occupy a small space, as

shown at Fig. 2, or lowered into the horizontal position for use, as shown at Fig. 1.

In connection with the folding frame as hereinbefore described we provide and utilize a mattress made of wire mesh, canvas, or other equivalent yielding material. We next provide the mattress foot-rail k , which consists of a piece of timber, tubing, or other suitable material, the length corresponding with the frame foot-rail c . We next provide the mattress material l of suitable length and width to form a mattress. One end of said mattress would be lapped over the mattress foot-rail or passed between said foot-rail k and a supplementary securing-rail m and secured to the foot-rail k in a similar or equivalent manner to that by which woven-wire or other mattress substance is usually secured to the inside foot-rail of a self-contained non-folding movable mattress. Our mattress foot-rail k , carrying the mattress l , would next be placed in position in front of the foot-rail c and connected thereto by means of the tightening-screws n , usually used in the construction of ordinary wire mattresses. We next utilize the mattress head-rail o to secure the head end of the mattress, connection being made between the head-rail o and the supplementary securing-strip p , and the complete combined folding bedstead or folding frame with its folding mattress would then be ready for use.

In lieu of the combined legs and shoe, as shown at Fig. 3, suitable for screwing direct to the floor of a room by means of screws taking into holes in the lugs q , we prefer in some cases to provide a shoe and leg of the configuration shown at Fig. 12 for use inside a movable cabinet, and in such cases the securing-pin would pass through the vertical back r of cabinet and so secure the mattress front rail o to the vertical back of the cabinet, the foot-lug q' being secured to the bottom s of the cabinet, and it will be readily understood that by withdrawing the securing-pins t from the back of the cabinet out of the rail-holes the complete mattress could be removed from the cabinet.

In lieu of the shoe shown in Fig. 3, with its cheeks h taking over the boss g' by an equivalent hinge, as shown at Figs. 6 and 7, in such cases the supplementary side rail u is equivalent to the shoe part of Fig. 3, carrying the cheeks h , and the cheeks h' , Figs. 6 and 7, are equivalent to the cheeks h of Fig. 3, the inside cheeks g^3 being also equivalent to the hinge-bracket, Fig. 4, the fulcrum-pin j' , Fig. 7, being equivalent to the pin j , (shown at Figs. 1, 5, and 13,) the radiation of the folding-mattress part, Figs. 6 and 7, on the joint-fulcrum j' acting in an exactly similar manner and producing the desired stretching of the mattress as described in relation to the shoe, Fig. 3, and in a like manner we in some cases prefer to utilize an ordinary flat hinge over the supplementary side-rail section cc and the side-rail section dd , the action of the

hinge ee on its axis ff being precisely the same as that hereinbefore described in relation to Figs. 3, 4, 6, and 7, it being noted that the rail-sections cc and dd form the side rails e .

The hinge at the folding joint f may be an ordinary flat hinge, as shown at r , Figs. 1 and 5, or such ordinary hinge may have connected thereto an additional member w , as shown at Fig. 14, to form a strut, the strut being connected by means of a chain x and radiating on the axis of the hinge and moving with the sides e when the mattress is folded.

The distance stretcher-bar y is provided to brace and connect the sides e together and also to support the mattress when collapsed into the vertical position shown at Fig. 2.

In using our improved combined folding bedstead and folding mattress we proceed in the following manner: The mattress, as shown at Fig. 1, would be stretched to the required tension by means of the tension-screw n . The raising of the end legs d of the bedstead, as shown at Fig. 5, would carry and fold the flexible mattress l into the desired position, as shown at Fig. 2. The constant tension is secured by means of the difference in the chords of the arcs described by the radiation of the bedstead and the mattress on their fulcrums, the radius described by the bedstead side rails being twelve inches shorter (more or less) than the radius described by the mattress from its junction z as a center or fulcrum. Consequently after the mattress l has conformed to the set stretched length over the bedstead sides there is an extra foot of mattress (more or less) behind the fulcrum-pin j , and this extra length of mattress enables the user of the mattress to stretch the mattress when commencing to fold the side rails into the position shown at Fig. 2.

The providing of the fulcrum-pin j as a center of radiation for bedstead sides above the said bedstead sides e , as shown in detail in Fig. 8, is the means whereby the stretched mattress is prevented from rising. Nevertheless, providing the center of fulcrum-pin j is situated centrally with the central horizontal plane of the stretched mattress, as shown at Fig. 9, the mattress could not rise; but when the central horizontal plane of mattress is strained at a distance considerably above the center of radiation, as shown at Fig. 10, the tendency of the strained mattress aa would be to raise the bedstead bb , and we show the illustration Fig. 10 as a means of demonstrating the action of the mattress, as illustrated at Figs. 8 and 9.

We utilize our improved system of folding mattress in the construction of self-contained folding couches and chairs of every description and also in the construction of seats that are not self-contained and movable, but that form folding fixed seats in rooms and vehicles. In each case the system of stretching the mattress part is the same—namely, the head folding part of the couch-frame or chair-seat frame or bench-seat frame or carriage-

seat frame radiates on a separate and distinct pivotal fulcrum-pin to that on which the back or head part of the mattress or seat radiates, the radius of the mattress part being greater than the radius of the folding frame or seat part.

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

1. In folding furniture, a stationary frame, a folding frame consisting of two folding sections, the inner section being fulcrumed upon the stationary frame, and an elastic mattress having one end secured to the outer end portion of the outer section of said folding frame, while the other end of said mattress is secured to the stationary frame.

2. In folding furniture, a stationary frame, a folding frame consisting of two folding sections, the inner section being fulcrumed upon the stationary frame, and an elastic mattress having one end secured to the outer end portion of the outer section of said folding frame, while the other end of said mattress is secured to the stationary frame in the rear of the point of fulcrum of the inner section.

3. In folding furniture, a stationary frame, a folding frame consisting of two folding sections, the inner section being fulcrumed upon the stationary frame, and an elastic mattress having one end secured to the outer end portion of the outer section of said folding frame, while the other end of said mattress is secured to the stationary frame in the rear of the point of fulcrum of the inner section, the parts being so arranged that when the folding frame is open and in a horizontal position the plane of the mattress is not above the plane of the fulcrum.

4. In folding furniture, a stationary frame, a folding frame consisting of two folding sections, the inner section being fulcrumed upon the stationary frame, and an elastic mattress having one end secured to the outer end portion of the outer section of said folding frame, while the other end of said mattress is secured to the stationary frame in the rear of

the point of fulcrum of the inner section, the parts being so arranged that when the folding frame is open and in a horizontal position the plane of the mattress is below the plane of the fulcrum.

5. In folding furniture, a stationary frame, a folding frame consisting of two folding sections, the inner section being fulcrumed upon said stationary frame, and an elastic mattress having one end adjustably secured to the outer end portion of the outer section of the folding frame, while the other end of said mattress is secured to the stationary frame.

6. In folding furniture, a stationary frame consisting of two upright brackets connected by a head-rail and having forwardly-extending shoes provided with check-plates, a folding frame consisting of two folding sections, the inner section comprising side rails having their inner ends pivoted between said check-plates, the outer section of said folding frame consisting of side rails pivoted at their inner ends to the side rails of the inner section and having a foot-rail and legs at the outer ends, and an elastic mattress connected at its opposite ends with the outer end of the outer section of the folding frame and with the stationary frame.

7. In folding furniture, a stationary frame, a folding frame consisting of two sections hinged together, a downwardly-extending arm at the hinge-joint connected with each of said members by a flexible connecting-piece, the inner section being fulcrumed upon the stationary frame, and an elastic mattress connected at its opposite ends with the outer end portion of the outer member and with the stationary frame.

In testimony that we claim the foregoing as our invention we have signed our names, in presence of the subscribing witnesses, this 3d day of December, 1897.

JAMES DOUGLAS RICHARDSON.
FREDERICK HENRY YOUNG.

Witnesses:

GEORGE WILKINSON,
GEO. H. MILLONS.