S. C. HOPKINS.
FOLDING-CHAIRS.

No. 194,433. Patented Aug. 21, 1877.

Fig.1.

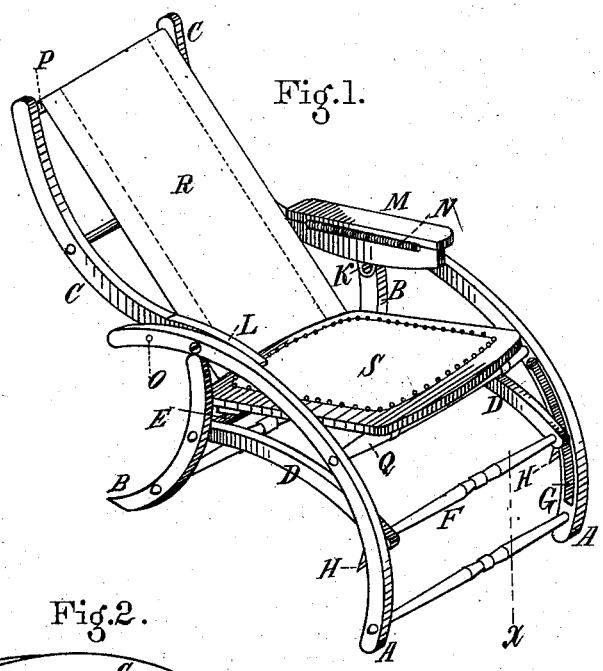


Fig.2.

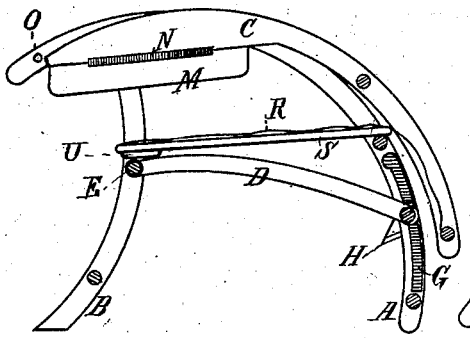


Fig.3.

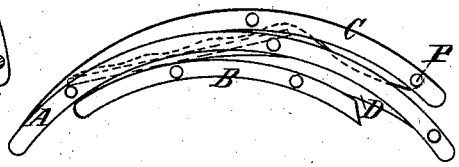


Fig.4.

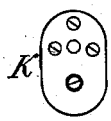


Fig.5.

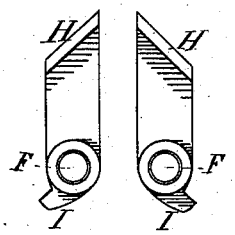
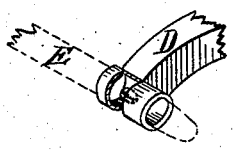


Fig.6.



Witnesses:
E. A. Phelps.
C. G. Keyes

Inventor:
Sylvanus C. Hopkins.
by A. Spencer,
his attorney.

UNITED STATES PATENT OFFICE.

SYLVANUS C. HOPKINS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN FOLDING CHAIRS.

Specification forming part of Letters Patent No. **194,433**, dated August 21, 1877; application filed March 31, 1877.

To all whom it may concern:

Be it known that I, SYLVANUS C. HOPKINS, of Boston, Massachusetts, have invented certain Improvements in Folding and Reclining Chairs, of which the following is a specification:

The object of this invention is to simplify, cheapen, and strengthen the frames of folding and reclining chairs, and to provide for folding them in the most compact manner.

My improvements relate to that class of folding chairs in which the leg-frames are separate and distinct from the back frame. A marked peculiarity of my chair is that these three frames are pivoted to each other at a common point, or at points but slightly remote, leaving the projecting ends free from permanent connection with any of the other parts.

Another distinctive and peculiar feature is that the legs and back rails are similar in shape to each other, so that they will lie closely upon or beside each other when folded; and for convenience, beauty, strength, and cheapness I make these similar parts of a form corresponding to the arc of a circle, as set forth in my application for a design patent filed simultaneously herewith.

My invention therefore consists in a folding chair in which the legs and back rails are made of separate parts, conforming in shape to arcs of circles, and pivoted at, or nearly at, a common point.

It also consists in the combination of parts and the peculiarities of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of my improved chair spread for ordinary use. Fig. 2 is a section of the same at *x* with the back folded upon the seat. Fig. 3 is a side view of the chair folded for transportation or storage. Fig. 4 is a view of the hinge which unites the two leg-frames and the back frame. Fig. 5 is a view of the locking device for the leg-braces, made full size. Fig. 6 illustrates a means of securing the braces to the rear leg-frames.

A A are the front legs, B B the back legs, and C C the side rails, of the back frame. These parts preferably correspond in shape to arcs of circles, so as to fold in the most compact manner, and should be formed of bent wood stock, so as to obtain the greatest strength from a given weight of material. The leg-frames A B, hinged together near their upper ends, are united by one or more braces, D, which may correspond in form and material to the back and legs, or may be straight and flexible, or jointed centrally. These braces are, by preference, two in number, and secured to a fixed rundle, E, uniting the rear legs, and to a movable one, F, adapted to rise or fall in grooves G, formed in the inner faces of the front legs as the chair is opened or closed. Thus the position of the braces D determines the distance between the feet of the legs A and B.

When the round F is at the top of the grooves G the legs are spread to the utmost, and the back drops into the position adapted for a reclining chair. When the round F is half-way down the grooves the legs approach each other, as in Fig. 1, and when it is at or near the bottom of the grooves the legs are closed together, as in Fig. 3.

It is important to be able to lock the braces in the various positions they occupy when the chair is spread for use, so as to give stability to the frame when it is moved; and my chair differs from others in provision for this want.

The lock shown in Fig. 5 constitutes a peculiar feature of my invention. It consists in a single casting or forging, made right and left, the free end H projecting slightly, as a lever, by which to manipulate the cam I upon its other end, which turns upon an axis formed upon or inserted in the end of the round F. The grooves G in the legs A are enlarged at the top, and at one or more intermediate points, to permit the cam to turn so as to stand transverse to the general direction of the grooves G. The weight of the part H tends to hold the cam in this position, and thus to keep the frame locked so that the chair may be moved without disturbing the relative position of the parts.

When it is desired to fold the chair, the

lever H is raised so as to throw the cam out of the enlargement of the groove, and permit it to travel freely.

As a means of securing the rear end of the braces to the leg-frames B, I prefer, for neatness of finish, the device shown in Fig. 6, consisting of a short section of metal tubing secured to the rear end of each brace by means of a screw passed through an aperture in the periphery of the tube, the screw-head bearing upon the inner side of the tube, and its threads entering the end of the brace. These tube-sections may also be secured to the braces by a screw at each end of the section, without an aperture. Screw-eyes may also be employed. The rundle E is passed through these metal rings, or instead a stud projecting from each rear leg enters the tubes or rings, permitting the braces to turn thereon. It is obvious that the arrangement of the braces may be reversed by hinging them in front and locking them to the rear legs, suitably grooved, and also that any convenient locking device may be substituted in place of that herein described.

The hinge K (shown in Fig. 4) is a peculiar feature of my invention. It is a flat metal plate about three thirty-seconds of an inch in thickness, secured to the side of the leg A, at a suitable point, by two or three screws, and projecting downward sufficiently to receive loosely a screw firmly inserted into the same side of the upper end of the leg B, permitting the legs to open and close freely. Another screw or bolt passes through the same plate, and enters the side rail of the back frame, which is at this point placed side by side with the upper part of the leg A. The leg-frames and back-frame are thus separated by the plate K as a washer, and turn upon it as a hinge common to the three parts. It is apparent that this plate may be permanently secured to either of the frames, as convenience may suggest, and that, with the connecting bolts or screws, it constitutes a cheap, convenient, durable, and unobtrusive hinge. The three frames A B C may, at their pivotal points, be placed side by side, and may thus be united by a single bolt passing through the washer.

The upper ends of the legs A A are prolonged beyond the hinges K, and the lower ends of the back rails extend forward from the hinges, so as to bring these two frames, for a certain distance, into parallelism. The upper surface of this part of these frames, brought to a common level, thus forms a broad and comfortable arm-rest, L, without additional expense. For chairs of finer quality I prefer to attach a separate arm-piece, M, at this point in the following manner: the arm-piece covers the back and leg frames in the vicinity of the hinge K, and has along its inner edge a side hinge, N, connecting it with the back frame. This hinge is, by preference, a coiled spring, one end of which is secured to the side rail C, and the other to the arm-piece M; or, if preferred, the hinge and spring may be entirely distinct. Thus when the back is folded upon the seat the arm-piece is turned upon its edge, and follows the end of the rail C in its movement, and when the back is again spread for use the tension of the spring returns the arm-piece promptly to its place, and tends to hold the back in position.

A suitable stop, O, preferably formed upon the inner sides of the prolonged ends of the leg-frames A, prevents the back frame from falling back too far. Aside from the attachment of the stops and arm-pieces, the projecting ends of the legs and back rails are entirely free and disconnected with any other parts, and hence the back frame may fold and unfold independently of the leg-frames. Thus the chair is folded by two distinct operations, either of which may precede the other. By folding the back while the legs are spread, less space is occupied, and dust is excluded from the seat and the front side of the flexible back.

I form the seat and back of my chair in one continuous piece of stout canvas, leather, carpet, or other suitable flexible material, supported loosely between the top round P of the back frame and a cross-bar, Q, at a proper height, connecting the front legs; or, without change in the other parts of the chair, I employ a rigid seat, S, its front end resting upon and secured to the cross-bar Q, and its rear end suspended by the flexible back R from the top of the back frame. In the latter case I arrange the parts so that the rear end of the seat, when occupied, will rest upon a round, E, of the rear leg-frame, or upon some other suitable stop to relieve the back of a portion of the strain, and in the better grade of chairs I interpose a block of rubber, U, between the seat and rest, or otherwise give to the stop some elasticity.

The operation of the chair is obvious.

I claim as of my invention—

1. A folding chair having the sides of its three folding sections formed of wood, bent to correspond in shape to arcs of circles, and pivoted upon hinges common to all said parts, substantially as set forth.

2. In a folding chair, the combination of a pivoted back frame, two leg-frames and their connecting-braces, with the locking device for the braces, substantially as set forth.

3. In a folding chair, the combination of the back frame and the two leg-frames with hinges K, constructed as described, uniting the frames, substantially as set forth.

4. In a folding chair which combines the three frames, as described, the arm-rest L, formed by the upper surfaces of two of the frames lying side by side, and pivoted to each other, substantially as set forth.

5. The combination of the front and rear leg-frames pivoted above the seat, and the

back frame folding independently of the other parts of the chair, substantially as set forth.

6. In a folding chair, the combination, with the back and leg frames, of an arm-piece hinged by its side to one of the frames, and arranged to fold inwardly when the chair is folded, substantially as set forth.

7. In a folding chair, the combination of a rigid seat, a flexible back attached to the seat, and a yielding stop beneath the seat supporting its rear end, substantially as set forth.

SYLVANUS C. HOPKINS.

Witnesses:
A. H. SPENCER,
H. W. LADD.