

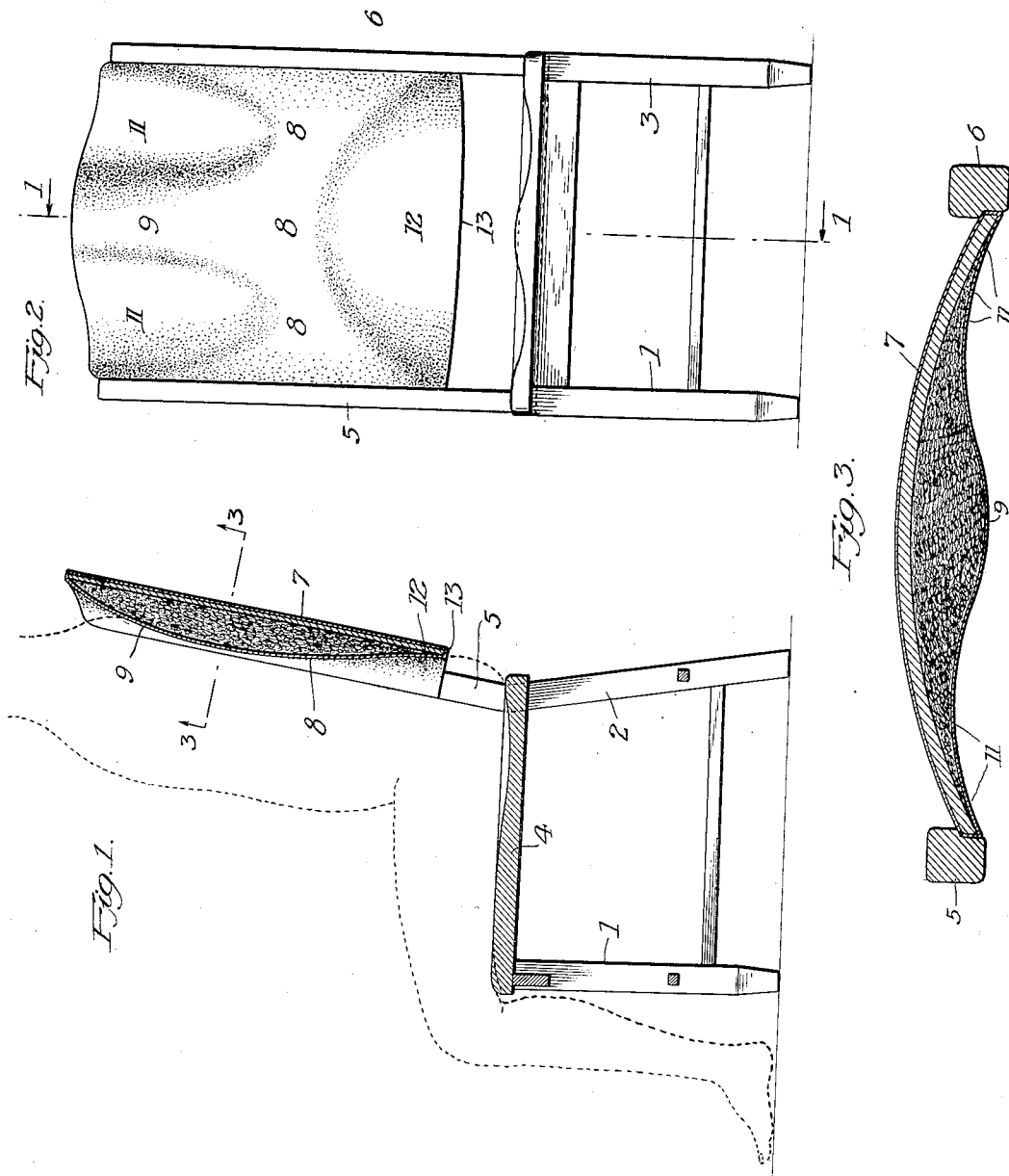
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CHAIR

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UNITED STATES PATENT OFFICE

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CHAIR

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This invention relates to improvements in chair constructions.

The general contour of the trunk of the body is convex in front and concave behind. This general form is essential for the normal functioning of the lungs, heart, liver, stomach, colon and other organs of the chest and abdomen. The spinal column, which with the ribs forms the framework and support of the soft parts of the trunk, is a structure so devised that it permits great latitude of temporary change in form while insuring, under normal conditions, maintenance of the essential physiologic curves of the trunk.

In quadrupeds, the normal curves of the trunk are maintained by gravity; but in human beings, when the body is erect, either in the standing or sitting position, gravity tends to destroy the normal spinal curves and to pull the trunk out of shape. The influence of gravity is resisted (a) by ligaments which connect the ribs and vertebrae in such a manner as to maintain the normal or physiologic curves; and (b) by more than 50 muscles so placed between the spine and ribs, pelvis and head that by voluntary action they may maintain the normal anterior convexity of the spine. When these muscles are relaxed, however, the trunk becomes more subject to the action of gravity and may assume postures which are highly detrimental to health. When the muscles are thus relaxed, an extra strain falls upon the ligaments, especially the costo-vertebral ligaments, causing pain and fatigue.

If the occupant of a chair be enabled, assisted and encouraged to maintain the normal trunkal curves while relaxed he will derive greater rest and recuperation, both real and apparent, than if he slumps down in a chair, as is commonly done and assumes a posture which is unhealthful for the human body. For example, it is not unusual for a person to so recline in a chair that his spine is permitted to curve rearwardly toward the chair back, while his shoulders are thrown forwardly. Long continued sitting with the lumbar spine unsupported causes backward displacement and fixation of the lumbar vertebrae and a straightening of the spine, which

exposes the central nervous system to constant irritation, especially when one is riding on a railroad or in an automobile.

The vertebrae and ribs form a cage for the lungs. The bony parts supply fixed points for the attachment of muscles by which the chest is expanded and contracted in the act of breathing. The normal curves of the spine give the chest its proper contours and must be maintained to enable the chest to act freely and to expand to its full capacity. Failure to support the flexible portions of the trunk and to maintain the proper spinal curves results in reducing the size of the chest cavity and relaxing the walls of the abdominal cavity. The circulation of blood and lymph, the control of which to a large extent centers in the lower abdomen, is seriously disturbed when the trunk of the body is not held up in its proper shape and the abdominal muscles are relaxed. A surplus of blood then accumulates in the abdomen and the rest of the body is inadequately supplied.

When the proper trunkal posture is not maintained the liver and other heavy organs of the abdomen sag down and drag after them the diaphragm to which they are attached. The diaphragm pulls down upon the heart and forces it into a vertical position in which it is under constant strain, and when it beats it is compelled to lift the liver, stomach and other organs which hang suspended from the underside of the diaphragm. Hence, while the slouching or slumping posture may seem restful, in fact it is itself productive of further fatigue and while it may by contrast with a standing position appear to be a relief from fatigue it is in fact far less adapted to yield relaxation and recuperation than the correct posture made possible by this invention.

This invention aims to provide a chair so shaped that the normal anterior convexity of the trunk and the natural curves of the spine are maintained even when the muscles are completely relaxed, thus preventing abnormal strain upon the ligaments, displacement of the viscera and various crippling deformities, such as flat chest or bulging abdomen. This invention not only serves as a preventive of bad posture habits and va-

rious injuries which result from sitting in the ordinary chair, but is a most effective means of posture training and also of correcting posture defects and deformities.

5 A special study of postural defects and their causes indicates to me that when the body is in the sitting position, support of the entire back is necessary, and especially is it necessary to support the upper dorsal spine
10 and the shoulders. A point of capital importance is the necessity for so placing the support for the shoulders and that of the upper spine that the latter shall be appreciably in advance of the former. This is due
15 to the fact that because of the large muscular masses on each side of the spine and the shoulder blades overlying them, the upper spine lies at the bottom of a furrow. For safety and comfort in sitting it is necessary
20 that the back should rest against a support which conforms to the normal shape of the back when the back is in the desired posture known to be conducive to healthful relaxation. If the support is flat or hollow, the
25 shoulder blades slip forward, and the spine is by the weight of the upper part of the trunk, arms and head forced backward, while the chest drops, the abdomen sags, the back is rounded, and all the injuries resulting from
30 bad posture then result. To prevent this, the center of the upper part of the chair back is extended forward sufficiently to fill the natural furrow between the shoulder blades. It is also necessary that the remainder of the
35 chair back should be curved so as to follow the contour of the body and thus support the sides of the trunk, thereby preventing the undue concentration of pressure upon a small area.

40 In general, therefore, it is an object of this invention to provide a support for the back so shaped that it promotes genuine recuperation and is never promotive of deformities or improper posture habits. Other objects and
45 advantages of the invention will become apparent upon a perusal of this specification.

In the drawing:

Fig. 1 is a sectional view on the line 1—1 of Fig. 2 showing a chair constructed in accordance with this invention.

Fig. 2 is a front elevation of the same chair.

Fig. 3 is a sectional view on the line 3—3 of Fig. 1.

55 In the drawing there is shown a chair having the usual four legs, of which legs 1, 2 and 3 are shown, upon which is secured a seat 4, the surface of which is shaped to conform to the curves of the human body and is generally inclined downwardly toward the rear
60 as shown in Fig. 1 to decrease the tendency of the body to slide forwardly thereon.

65 The chair back comprises the upwardly extending frame members 5 and 6 between which is affixed the chair back frame 7. As shown particularly in Figs. 1 and 2 the lum-

bar vertebrae of the spinal column are urged into a forwardly convexed normal curvature by means of a horizontally extending forwardly projecting surface on the chair back upholstery referred to throughout its extent
70 by the numerals 8. This portion of the chair back supports what is commonly known as the small of the back. Above the lumbar supporting portion of the chair back and convexed forwardly from the general surface
75 of the chair back is what I term the dorsal support 9. Commonly in this portion of a chair back the surface is concaved toward the rear rather than convexed toward the front, causing the occupant's back to become rounded
80 from shoulder to shoulder, pushing against the shoulder blades, forcing them forwardly and flattening the chest, a posture which is known to be decidedly harmful. The dorsal support 9 herein provided supports the
85 back between the shoulder blades and in the region of the dorsal vertebrae, tending to hold these vertebrae in their normal forwardly recessed position in the human body, encouraging and enabling the shoulders to roll
90 back, and allow the chest thus to expand. However, without additional support for the upper part of the trunk there would be a tendency for the back of the person to rock
95 about the dorsal support 9. Consequently I have arranged that the lateral margins of the upper portion of the chair back, namely at the positions marked 11, be curved forwardly so as to touch against the outer ex-
100 tremities of the shoulders of the occupant, supporting them when they are back in their proper position. By this combination of supports the entire back is supported at each and every portion in a manner most conducive
105 to the proper maintaining of all of the organs of the body in the positions best suited for their easy and healthful functioning.

The lower portion of the chair back at 12 is cut back and terminates at the line 13
110 thus contributing to the natural posture of the lower portion of the back of the occupant.

The surface of the seat back is inclined generally from a vertical position sufficiently
115 so that when the human back is resting snugly against the supporting surfaces the weight of the upper part of the trunk will naturally be thrown sufficiently against the lumbar support 8 as to maintain the lumbar curve naturally and against the dorsal support 9 so
120 as to naturally and without conscious effort cause the chest to be normally expanded and the shoulders to recline comfortably in the concaved supporting surfaces provided for them. Experimentation has determined that
125 if the upper half of the chair back above the small of the back be inclined at about 80° from the horizontal the desired effect will be obtained.

The manner of providing proper relative curvatures of the surface of the chair back is
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subject to considerable variation. For example, a number of pads could be placed upon a flat frame and shaped and combined so as to equal the structure shown in the drawing.

5 On the other hand, the padding assembled on the rear frame member 7 may be arranged and fixed and then covered with some suitable upholstery so as to give a unitary appearance to the entire chair back, retaining however
10 all of the advantages of the invention.

The chair construction herein disclosed is found to be exceptionally well suited for use in school rooms and also for use in theaters, although it is evident that it should find many
15 other very proper uses.

Having shown and described my invention, I claim:

1. A chair back having a surface forwardly convexed about a horizontally extending
20 axis to support the lumbar region of a human back in its normally curved position, a concave surface below said convexed surface, and above said convexed surface a pair of concave shoulder supporting surfaces whose
25 lateral margins curve forwardly and whose inner margins merge with a centrally located convexed surface provided on the chair back therebetween.

2. A chair back having a surface forwardly convexed about a horizontal axis in the
30 lower half of the chair back, a surface there-

above forwardly convexed about an upwardly extending axis arranged centrally of the chair back, and concave shoulder supporting surfaces at both sides of the second convexed surface, the lateral margins of said shoulder supporting surfaces being curved forwardly. 70

3. A chair back provided with a centrally positioned surface of gentle curvature forwardly convexed about an upwardly extending axis arranged to give support directly to only that portion of the occupant's back which lies immediately adjacent his dorsal vertebrae, and concave shoulder supporting surfaces on either side of said central surface merging therewith and curved forwardly at their lateral margins. 75 80

4. A chair back provided with a centrally positioned surface of gentle curvature forwardly convexed about an upwardly extending axis arranged to give support directly to only that portion of the occupant's back which lies immediately adjacent his dorsal vertebrae, and at both sides of the first surface concave shoulder supporting surfaces the lateral margins of which curve forwardly approximately as far as the forwardmost portion of the first said surface. 85 90

In witness of the foregoing I affix my signature.

JOHN HARVEY KELLOGG. 95

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