

Jan. 19, 1960

D. N. HUMPHRIES ET AL

2,921,623

CHAIR STRUCTURE

Filed June 23, 1958

6 Sheets-Sheet 1

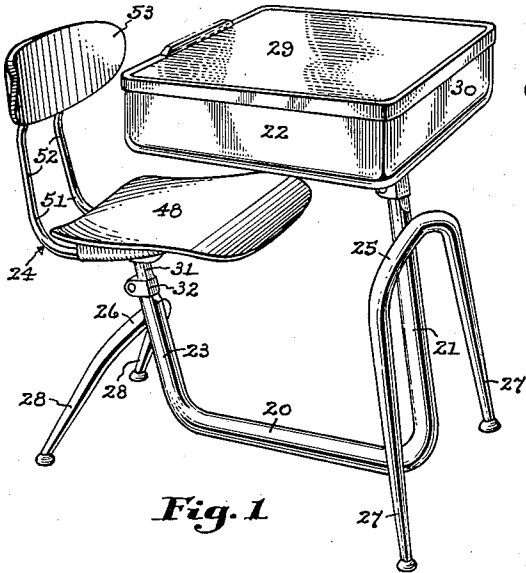


Fig. 1

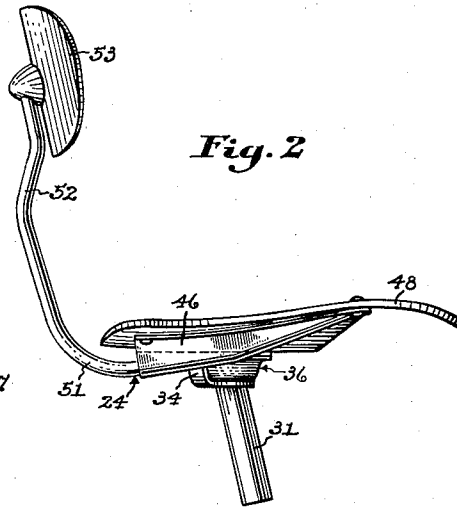


Fig. 2

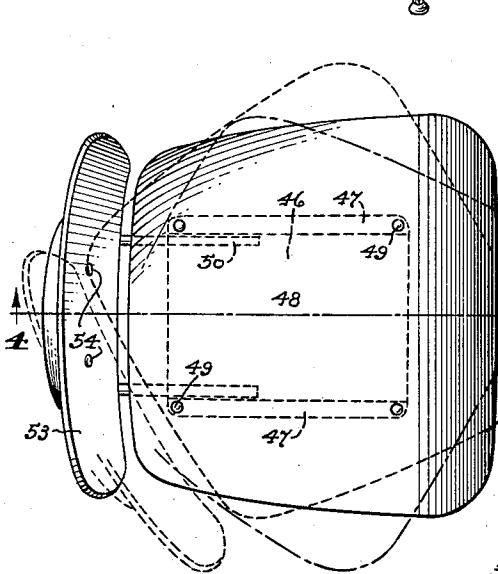


Fig. 3

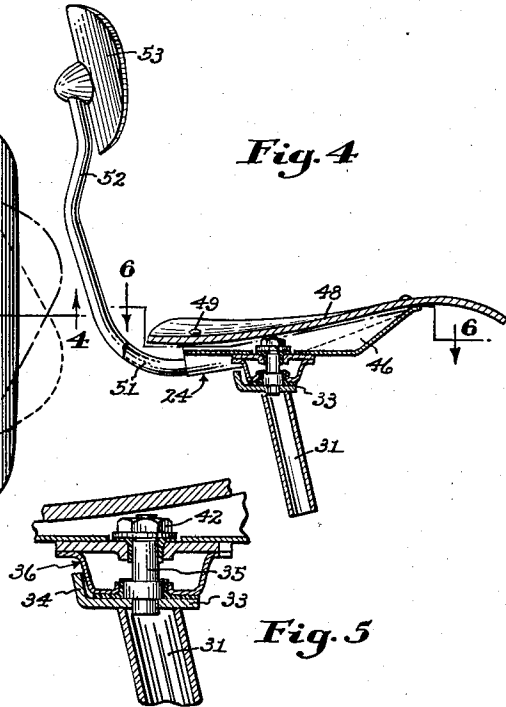


Fig. 4

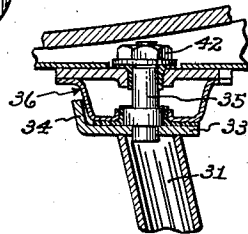


Fig. 5

INVENTORS

Douglas N. Humphries
and Walter E. Nordmark

BY

John S. Braddock

ATTORNEY

WITNESS

Harry S. Brown Jr.

Jan. 19, 1960

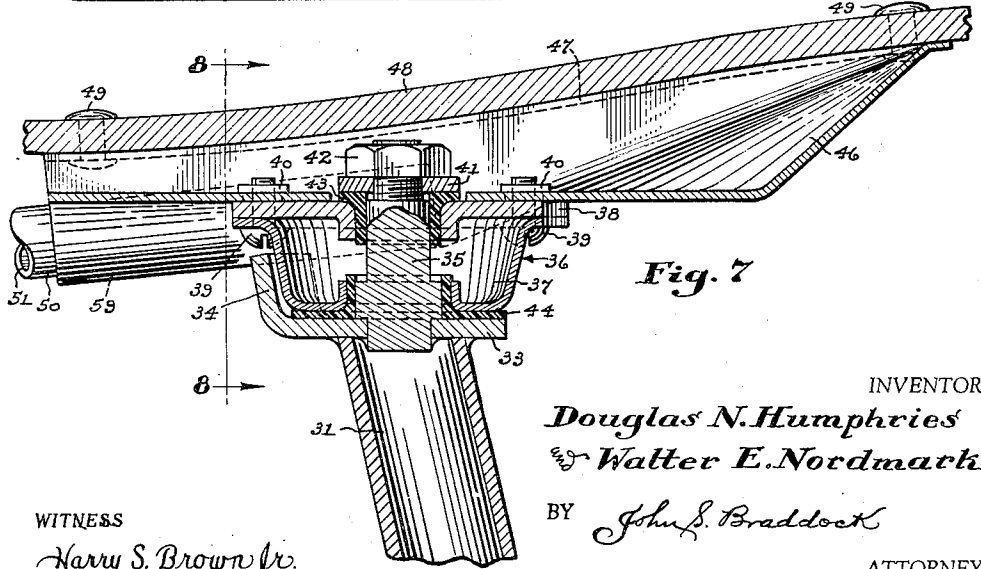
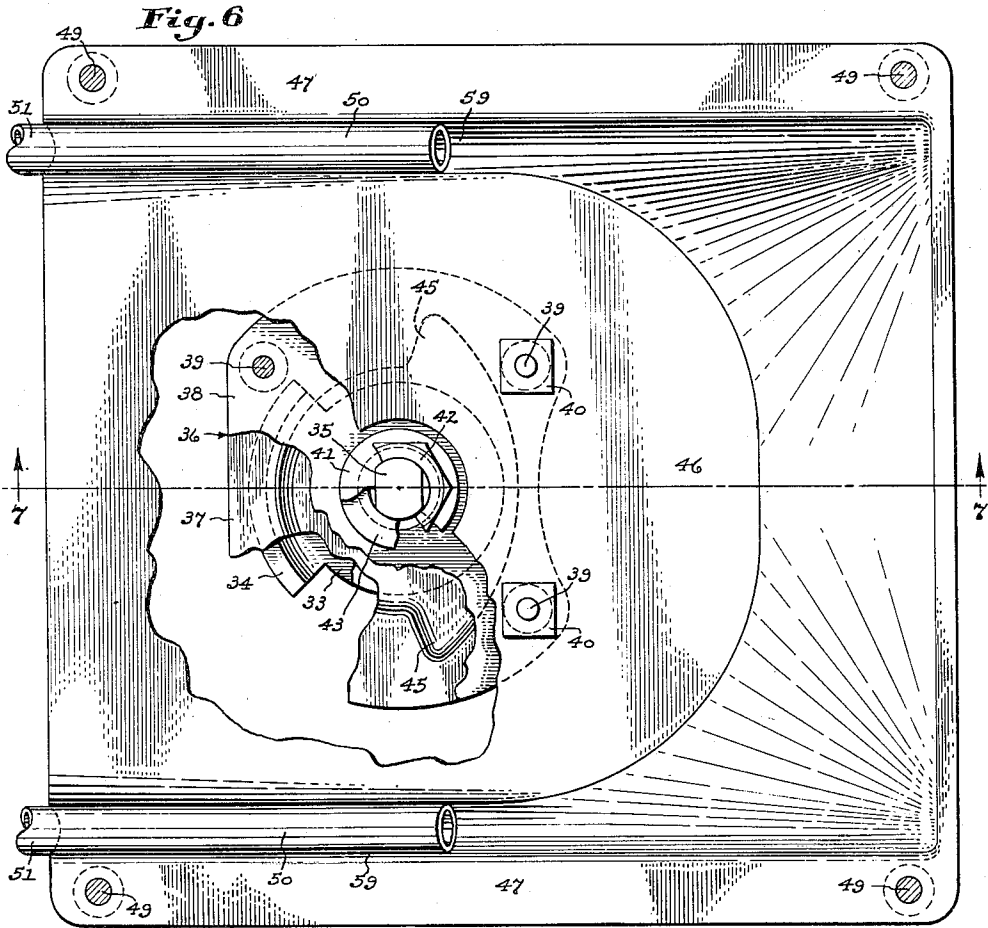
D. N. HUMPHRIES ET AL

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WITNESS
 Harry S. Brown Jr.

INVENTORS
 Douglas N. Humphries
 & Walter E. Nordmark
 BY John S. Braddock
 ATTORNEY

Jan. 19, 1960

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6 Sheets-Sheet 4

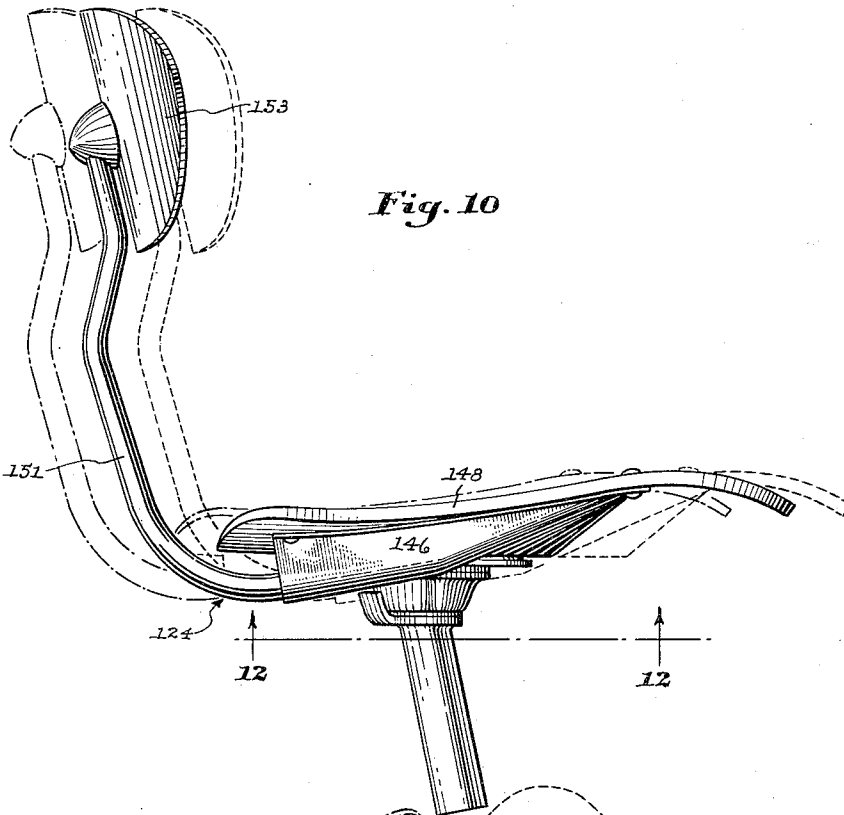


Fig. 10

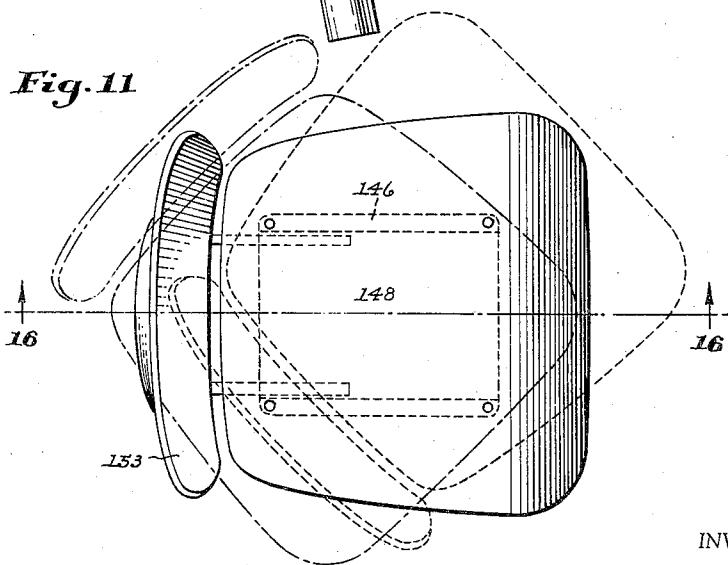


Fig. 11

INVENTORS

Douglas N. Humphries
& *Walter E. Nordmark*

BY *John S. Braddock*

ATTORNEY

WITNESS

Harry S. Brown, Jr.

Jan. 19, 1960

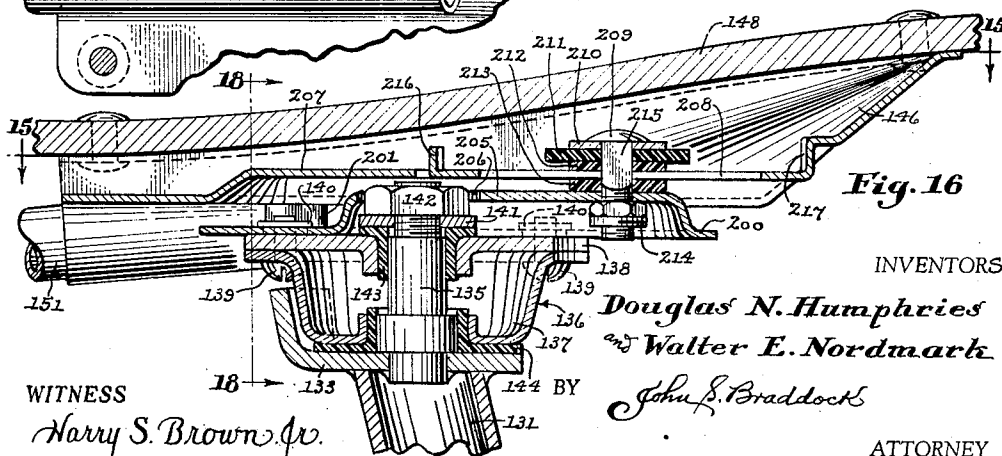
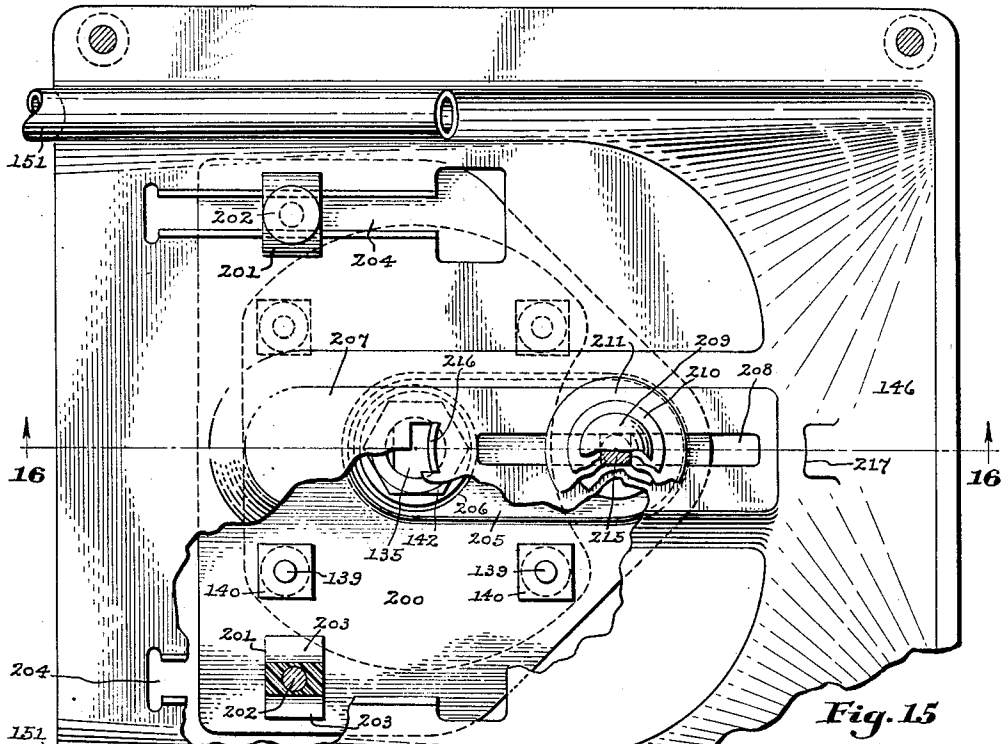
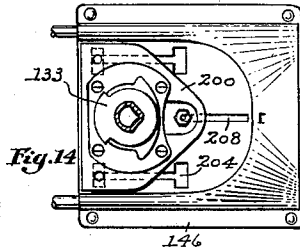
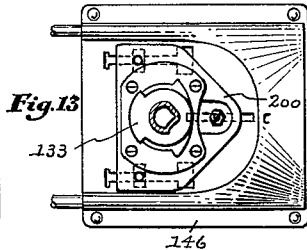
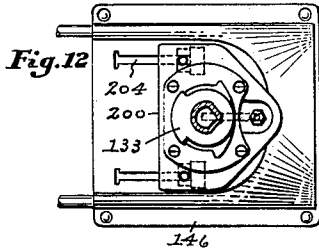
D. N. HUMPHRIES ET AL

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CHAIR STRUCTURE

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INVENTORS

Douglas N. Humphries
Walter E. Nordmark

WITNESS

Harry S. Brown, Jr.

BY John S. Braddock

ATTORNEY

Jan. 19, 1960

D. N. HUMPHRIES ET AL

2,921,623

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6 Sheets-Sheet 6

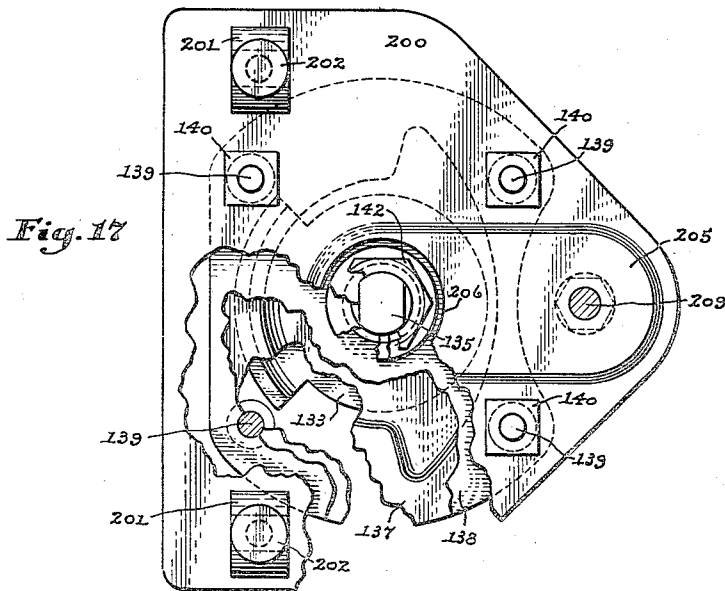


Fig. 17

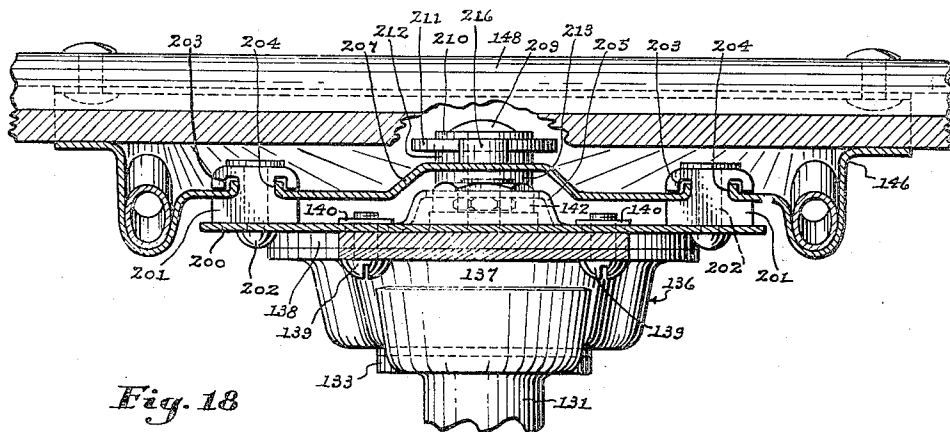


Fig. 18

INVENTORS

Douglas N. Humphries
Walter E. Nordmark

BY

John S. Braddock

ATTORNEY

WITNESS

Harry S. Brown Jr.

1

2,921,623

CHAIR STRUCTURE

Douglas N. Humphries and Walter E. Nordmark, Grand Rapids, Mich., assignors to American Seating Company, Grand Rapids, Mich., a corporation of New Jersey

Application June 23, 1958, Serial No. 743,777

7 Claims. (Cl. 155—95)

The present invention relates to chairs and more particularly to the chair parts of combination chair-desks primarily intended for use in classrooms. This application is a continuation-in-part of our co-pending application Serial No. 598,804, filed July 19, 1956, now abandoned.

The primary objects of the invention are to provide improved mountings for the chair parts of combination chair-desks; to provide such mountings which permit limited rotational movement of the chair to facilitate ingress to and egress from the chair-desk; to provide such chair mountings which with slight modification may also be adapted to permit limited forward-rearward sliding movement of the chair thus to enable the occupant to adjust his position relative to the desk part of the structure; and in general to provide such improved chair mountings which are quiet and efficient in operation, long-wearing, and reasonably economical in manufacture.

Illustrative embodiments of the invention are shown in the accompanying drawings, wherein:

Figure 1 is a perspective view of a combination chair-desk of a type frequently used in classrooms;

Figure 2 is a side elevational view of the chair-top part of the structure;

Figure 3 is a top plan view of the chair-top which is indicated in different turned positions in dotted and broken lines;

Figure 4 is a view of the same partly in side elevation and partly in central vertical section taken on line 4—4 of Figure 3;

Figure 5 is a somewhat enlarged fragmentary sectional of certain parts also seen in Figure 4;

Figure 6 is a greatly enlarged view, partly in top plan and partly in horizontal section taken on line 6—6 of Figure 4, of the chair mountings per se, with parts thereof broken away to better reveal other parts beneath;

Figure 7 is a vertical sectional view of said chair mountings taken on line 7—7 of Figure 6;

Figure 8 is a vertical sectional view of the same taken on line 8—8 of Figure 7;

Figure 9 is a horizontal sectional view of parts thereof taken on line 9—9 of Figure 8;

Figure 10 is a side elevational view of the chair-top modified in such a way that the seat is forwardly-rearwardly slidable as well as rotatable, the seat and back being indicated in forwardly slid and rearwardly slid positions by dotted and broken lines respectively;

Figure 11 is a top plan view of the same;

Figure 12 is a bottom plan view of the chair mountings as seen from the section line 12—12 of Figure 10;

Figure 13 is a view similar to Figure 12 and showing certain parts in different moved positions;

Figure 14 is another view similar to Figure 12 and showing the parts in still other moved positions;

Figure 15 is a greatly enlarged, fragmentary view, partly in top plan and partly in horizontal section taken on line 15—15 of Figure 16, of the modified form of chair mountings per se, with parts thereof broken away to better reveal other parts beneath;

Figure 16 is a vertical sectional view of said modified chair mountings taken on line 16—16 of Figure 15;

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Figure 17 is a top plan view of certain parts of the modified chair mountings, with parts thereof broken away to better reveal other parts beneath; and

Figure 18 is a vertical sectional view of the modified chair mountings taken on line 18—18 of Figure 16.

Referring now in detail to these drawings, the combination chair-desk shown in Figure 1 has a supporting frame consisting of a central metal U-tube 20 the front post 21 of which forms the support for the desk box 22 and the rear post 23 of which forms the support for the chair-top 24 of the structure. Inverted U-tubes 25, 26 secured as by welding to the front post 21 and rear post 23 respectively, form the front legs 27 and rear legs 28 of the frame. This chair-desk unit is made in two types, both of which present the same general appearance.

In type I the cover 29 is hinged to the front wall 30 of the desk box 22 so that it can be lifted in the rear to give access to the interior of the box. When in use the level cover 29 and chair-top 24 remain in constant spaced relation. The chair-top is mounted for limited rotation to facilitate ingress and egress, and these rotational mountings are illustrated in Figures 2—9.

In type II, the cover 29 is mechanically connected to the desk box 22 in such a manner that the cover can be manipulated to any of several rearwardly-downwardly inclined positions for different tasks. In this type II it is desirable that the occupant be able to adjust himself forwardly or rearwardly relative to the desk top or cover 29, and to this end the seat mountings are somewhat modified so as to provide a limited fore-and-aft adjustment in addition to the limited rotational movement. This modified form of the invention is illustrated in Figures 10—18.

Referring now to the form of the invention seen in Figures 2—9, the chair-top 24 comprises an upright tubular supporting column 31 which telescopes into the rear post 23 of the supporting frame, and a clamp 32 is desirably provided for securing the chair-top in vertically adjusted position on the post. A circular base plate 33 is welded onto the upper end of the column 31 in generally horizontal disposition (see Figure 7), and has an elongated arcuate stop 34 projecting upwardly from the rear edge thereof. A shaft 35 has its lower end welded into a central opening in the base plate 33. A supporting bracket 36 is rotatably mounted on the shaft 35, said bracket comprising a lower cup member 37 and an upper plate member 38 rigidly connected together by means of bolts 39 having nuts 40 on their upper ends, said members 37, 38 providing aligned central bearing openings through which pass the shaft 35.

The upper end of the shaft 35 is flattened to receive a washer 41 keyed thereto and is threaded to receive a nut 42 for securing the supporting bracket 36 on the shaft. An upper anti-friction bushing 43 is interposed between the shaft 35, washer 41 and plate member 38, and a lower anti-friction bushing 44 is interposed between the shaft 35, base plate 33 and cup member 37. These bushings 43 and 44 are desirably made of molded polyamide resin (nylon) so as to provide for smooth, quiet operation and long wear.

The lower cup member 37 of the supporting bracket 36 is of pressed sheet metal which is drawn outwardly at its opposite sides to form protuberances 45 which serve as stops and are adapted to contact the arcuate stop 34 on the base plate 33 to limit turning movement of the supporting bracket 36 in both directions (see Figure 9).

A stamped sheet metal carriage 46 is secured to the supporting bracket 36 by the same bolts 39 and nuts 40 which secure the members 37, 38 of the supporting bracket together. The carriage 46 is generally square in plan and is drawn upwardly at the front and sides to provide flanges 47 to which the chair seat 48 is secured by means of rivets 49. It will be seen that the carriage 46

is of sufficient depth to provide ample clearance between the chair seat 43 and the nut 42, and that the flanges 47 are formed so as to fit the curvature of the seat.

The carriage 46 has at its opposite sides a pair of laterally spaced, forwardly-rearwardly extending, downwardly depressed grooves 59 in which are welded the horizontal lower portions 50 of a pair of back support tubes 51. The upper portions 52 of the back support tubes extend from the lower portions 50 upwardly behind and above the chair seat 48, and a chair back 53 is secured as by means of rivets 54 to the upper ends of the back support tubes 51.

In the modified form of the invention seen in Figures 10-18, the chair-top 124 is mounted for fore-and-aft movement as indicated by dotted and broken lines in Figure 10, as well as for limited rotation as indicated by dotted and broken lines in Figure 11. Most of the parts of the seat mountings in this modified form are identical to those shown in Figures 2-9 and hereinbefore described, including (see Figure 16) the column 131, base plate 133, shaft 135, supporting bracket 136, washer 141, nut 142, bushings 143 and 144, seat 148, back support tubes 151 and back 153. The fore-and-aft adjustment is accomplished by modifying the pressed sheet metal carriage 146 and by interposing an adapter plate 200 and several bearing parts between the supporting bracket 136 and the carriage. The adapter plate 200 is secured to the supporting bracket 136 by the same bolts 139 and nuts 140 that secure the two members 137 and 138 of the supporting bracket in assembly.

A pair of laterally spaced rear guides 201 is secured to the rearward part of the adapter plate 200 by means of rivets 202. These guides 201 have inwardly and upwardly extending grooves 203 (see Figure 18) which slidably receive the upwardly turned metal adjacent slots 204 formed in the carriage 146. The forward middle part of the adapter plate 200 has a raised emboss 205, and an aperture 206 therethrough provides clearance for the nut 142 (see Figure 16). The forward middle part of the carriage 146 likewise has an upwardly formed emboss 207 generally conforming to the emboss 205 and provided with a forwardly-rearwardly extending center slot 208 therethrough (see Figures 15 and 16). A bolt 209 passes downwardly through aligned apertures in a metal washer 210, a stop washer 211 and an upper bearing washer 212, through the slot 208, then through aligned apertures in a lower bearing washer 213 and the emboss 205. A lock nut 214 threaded on the lower end of the bolt 209 secures all of these parts in assembly, and the squared upper part 215 of the bolt's shank prevents any turning of the bolt.

The upper and lower bearing washers 212 and 213, and also the rear guides 201 are desirably molded of nylon to insure smooth, quiet forward-rearward sliding movement of the chair-top, and long wear. The stop washer 211 limits forward and rearward movements of the chair-top when it is contacted by stops 216 or 217 respectively, which are formed in the carriage 146, and this stop washer 211 may be made of a suitable plastic or rubber so as to cushion and silence the stopping of the carriage.

It will thus be seen that the invention provides a novel chair structure in which the chair-top is mounted for limited rotation, and which may also be adapted for limited fore-and-aft movement. While but two specific embodiments of the invention have been herein shown and described it will be understood that numerous details thereof may be altered or omitted without departing from the spirit of the invention as the same is defined by the following claims.

We claim:

1. In a chair structure: an upright supporting column; a circular base plate fixedly secured to the upper end of the column in generally horizontal disposition and having an elongated arcuate stop projecting upwardly from

the rearward portion of the periphery thereof; a shaft extending upwardly from the center of the base plate; a supporting bracket mounted on the base plate for rotation about said shaft, said bracket comprising a lower cup member and an upper plate member rigidly connected together and provided with aligned central bearing openings through which pass said shaft, said lower cup member having projections at its opposite sides adapted to contact said arcuate stop to limit the turning movement of the supporting bracket in both directions; means on the upper end of the shaft for securing the supporting bracket in position thereon; a carriage mounted on the supporting bracket for turning movement therewith; and a chair seat mounted on said carriage.

2. A chair structure according to claim 1 in which the lower cup member of the supporting bracket is formed of sheet metal drawn outwardly at the opposite sides to form said projections.

3. A chair structure according to claim 1 in which the central bearing opening in the supporting bracket's lower cup member is surrounded by an annular flange extending upwardly from the bottom of said cup member, and in which a lower anti-friction bushing has a flat circular portion interposed between said cup member and the base plate and an annular portion extending upwardly between the shaft and the annular flange on said cup member.

4. A chair structure according to claim 1 in which a flat washer is keyed on the shaft above the supporting bracket's upper plate member and in which the central bearing opening in said plate member is surrounded by an annular flange depending from said plate member, and in which an upper anti-friction bushing has a flat circular portion interposed between said washer and said plate member and an annular portion depending between said shaft and the annular flange on said plate member.

5. A chair structure according to claim 1 in which the central bearing opening in the supporting bracket's lower cup member is surrounded by an annular flange extending upwardly from the bottom of said cup member, and in which a lower anti-friction bushing has a flat circular portion interposed between said cup member and the base plate and an annular portion extending upwardly between the shaft and the annular flange on said cup member, and in which a flat washer is keyed on the shaft above the supporting bracket's upper plate member and in which the central bearing opening in said plate member is surrounded by an annular flange depending from said plate member, and in which an upper anti-friction bushing has a flat circular portion interposed between said washer and said plate member and an annular portion depending between said shaft and the annular flange on said plate member.

6. A chair structure according to claim 1 in which a chair back is mounted on said carriage independently of the chair seat.

7. A chair structure according to claim 6 in which the carriage has a pair of laterally spaced, forwardly-rearwardly extending grooves therein; a pair of back support tubes having forwardly-rearwardly extending lower portions secured in said grooves and upper portions extending from the lower portions upwardly behind and above the chair seat; and a chair back mounted on the upper ends of said vertical upper portions.

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