June 28, 1932. C. A. HACH ET AL 1,864,535

CHAIR

Filed Aug. 14, 1928

Fig. 1.

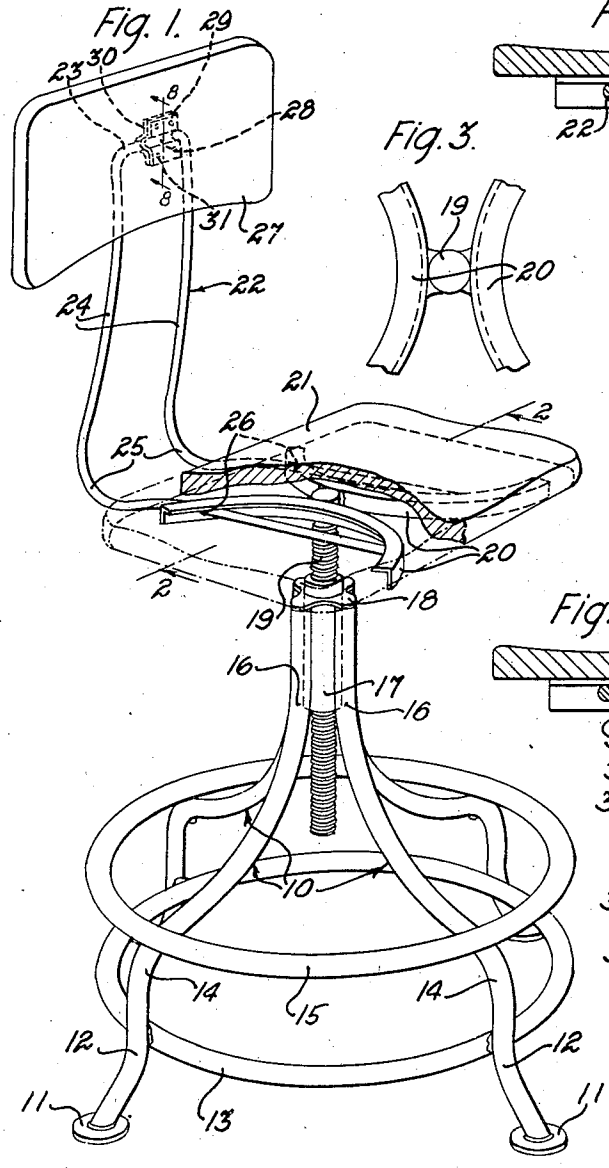


Fig. 2.

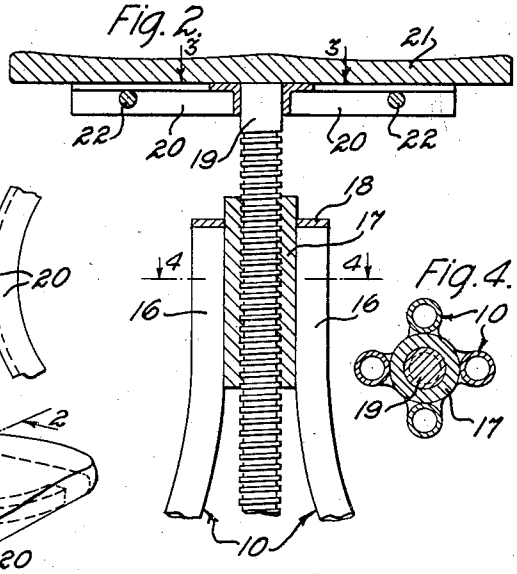


Fig. 3.

Fig. 4.

Fig. 5.

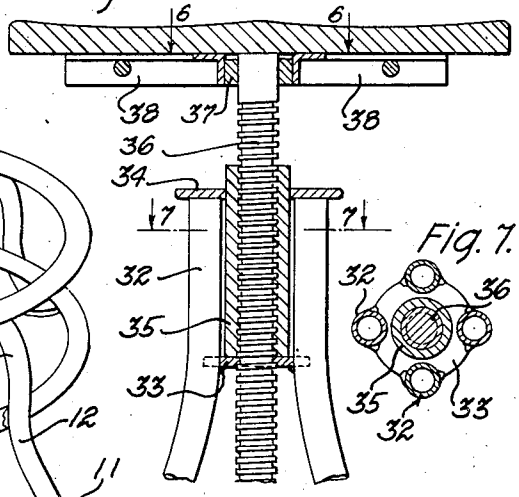


Fig. 7.

Fig. 8.

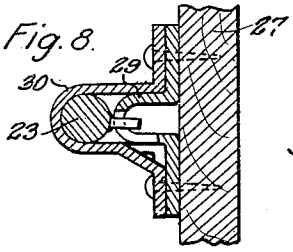
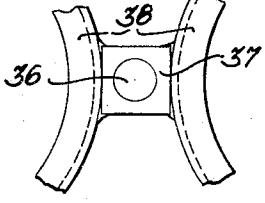


Fig. 6.



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UNITED STATES PATENT OFFICE

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CHAIR

Application filed August 14, 1928. Serial No. 299,524.

This invention relates to improvements in chairs, and more particularly to adjustable metal chairs.

Objects of the invention are to provide a comfortable and sturdy, though lightweight, chair constructed largely of metal tubing, and which may be economically manufactured.

In accordance with the general features of the invention, a substantially all metal adjustable chair is provided by using metal tubing wherever the nature of the part permits. The objects of the invention are secured by utilization in a seat-supporting construction of arcuate members welded to a vertical screw, and by a standard composed of tubular metal legs reinforced with tubular metal rungs.

In the preferred form of the invention the seat-supporting arcuate members are welded to a vertical screw member which cooperates with the internally threaded sleeve of the standard to render the chair adjustable as to height. The leg members of the standard are welded at an upper point, where they converge to an internally threaded sleeve. The back rest is supported by a suitably formed rod welded to the arcuate supporting members under the seat. This rod passes through a friction hinge clamp secured to the rear surface of the back rest, permitting the back rest to revolve upon the rod as a horizontal axis so as to be adjustable to suit the height and posture of the user.

In a modified form of the invention, the metal tubes constituting the legs are welded to spaced discs which in turn are welded to an internally threaded screw. In this form the arcuate angle iron members are welded to an intermediate block which is welded to the screw.

It is believed that the invention will be clearly understood from the following detailed description taken in connection with the accompanying drawing, in which

Fig. 1 is a perspective view of an adjustable chair embodying a preferred form of the invention, with the seat partly broken away to more clearly show the supporting structure;

Fig. 2 is an enlarged vertical section taken on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary top plan view of the seat supporting means shown in Fig. 1;

Fig. 4 is a fragmentary section taken on the line 4—4 of Fig. 2;

Fig. 5 is an enlarged vertical section, corresponding to Fig. 2, but showing a modified form of standard and seat assembly;

Fig. 6 is a fragmentary top plan view of the seat supporting means, shown in Fig. 5;

Fig. 7 is a fragmentary section taken on the line 7—7 of Fig. 5, and

Fig. 8 is a fragmentary section taken on the line 8—8 of Fig. 1.

In the drawing, in which like numerals indicate like parts throughout the several views, Figs. 1 to 4 inclusive illustrate a preferred form of chair embodying the invention. In this embodiment there are provided ogee-curved tubular metal legs 10 which at their lower extremities are welded to the centers of metal discs 11. A short distance from the lower extremities, equal to approximately one-eighth of the length of the legs, they are curved inwardly as indicated at points 12, although this curve may be eliminated under certain conditions which may arise. Welded to the legs at these points and embraced within the legs is a circular rung 13, preferably of tubular metal. An equal distance farther up the legs there is a more pronounced curvature outwardly as indicated at points 14. Secured to the legs at these points and embracing them is a rust proof metal rung 15. Beyond points 14 the legs are curved inwardly for a distance of approximately one-half their length to points 16. The portions of the legs extending beyond point 16 are straight, vertical and parallel. An internally threaded sleeve 17 is

welded to the parallel portions of the legs and is so disposed that its upper end projects beyond the upper ends of the legs. An apertured flat metal plate 18 may be welded or otherwise attached to the legs or sleeve in such manner as to effectually close the ends of the tubular metal legs 10. Acting revolvably through the internally threaded sleeve 17 and plate 18 is a screw 19, so threaded as to engage and cooperate with the internal threads of the enclosing sleeve 17. At its upper end, the screw is securely held and welded between a pair of arcuate angle iron members 20. Resting on the horizontal surfaces of the angle iron members 20 is a suitable seat 21 which may be constructed of metal, wood, a cane slide inserted into a wood frame, or other usual type. To form the back of the chair there is provided a spring steel rod 22 which is bent to form a horizontal portion 23, two parallel portions 24 extending from the horizontal portion 23 to slightly below the level of the angle iron members 20. At points 25 the end portions of the rod are sharply curved through approximately 300° to produce horizontal portions which pierce the angle iron members at points 26, extend from those points directly across the width of the arcs described by the arcuate angle iron members, and are welded to the interior wall of the angle iron members 20. The chair is provided with a back rest 27 constructed of wood or other suitable material supported on the rod 22 at its horizontal portion 23 by means of a friction clamp 28, composed of cooperating leaves 29 and 30, which clamp is suitably secured to the back rest 27 by means of screws 31.

It will be understood that the above tubular construction reduces the possibility of tearing clothing and provides a sanitary article of furniture. The welding of the lower ends of the legs to discs insures a broad flat footing making for stability and reduces scoring of linoleum or flooring to a minimum. It is also possible by using a swivel foot member to secure these results even when the chair is tilted by the operator. The welding to the inner sides of the legs at points 12 of a metal rung braces them and co-acts with the other securing means employed to do away with the possibility of loosening or bending of any of the separate parts of the standard. It is also contemplated using under certain circumstances for a similar purpose, instead of the metal rung, a pressed metal spider which will be secured to the legs at these points. The use of the rust proof metal rung secured to the outside of the legs at points 14, reduces the danger of soiling hosiery of the user and is so located with respect to the center of gravity as to cause the chair to be non-tipable even if the full weight of a person is placed on the rung. The deep convex curvature of the legs produces a low center of gravity while the welding of a long portion of the legs together along the sides of the internally threaded sleeve member produces qualities of rigidity and durability which are desirable from the standpoint of the user. The attaching of a flat metal plate on the top of the united legs and sleeve serves to protect them and prevent dirt and refuse from gaining access to the interior of the legs and to the screw, besides providing a finished article. By welding the back support rod to the arcuate angle iron members and by welding the latter to the screw the entire seat frame is produced as a unit, thus reducing possibility of loosening and loss of individual parts. The leaves 29 and 30 cooperate with each other since the rod portion 23 is journaled between them to render the back adjustable. It may be readily seen that the screws 31 which secure the friction clamp to the back rest so holds the leaves as to make the back rest normally immovable on the horizontal rod section 23, yet permits its adjustment through tilting or straightening to correspond with the height, posture or figure of the user by the application manually of a comparatively small amount of effort.

In the modified form of the invention illustrated in Figs. 5, 6, and 7, the legs 32 at their straight parallel upper portion are securely welded to spaced discs, the lower one of which, 33, is fluted at those points where it receives the legs 32 and is there welded to them; and the upper one of which, 34, is securely welded on its lower surface to the upper ends of the legs 32. The discs 33 and 34 are welded to the bottom and top, respectively, of an internally threaded sleeve 35. Acting revolvably through the internally threaded sleeve 35 and the discs 33 and 34 is a screw 36 so threaded as to engage and cooperate with the internal threads of the sleeve 35. The upper end of the screw 36 is welded to a block 37 which is in turn welded on opposite sides to the vertical walls of the arcuate angle iron members 38.

In the embodiment described above the welding of the upper portion of the legs 32 into a structure unitary with the spaced discs 33 and 34, and the welding in turn of the discs to the internally threaded sleeve produces a rigid structure comparing favorably with the preferred embodiment in point of sturdiness and solidity. The seat frame is similar to that of the preferred form, except that as shown in Figs. 6 and 7, the block 37 being welded to the top of the threaded screw 36, which engages the internally threaded sleeve 35 of the standard, acts to spread and maintain the arcuate members somewhat apart, thus securing a wider seat support.

The use of materials such as curved tubular members and comparatively slender arcuate

members in the construction described, impart to the chair a resilient quality making for comfort which is the more marked in view of the sturdy construction. An important feature of the improved structure is the resolving of the various forces acting upon the various parts of the chair when it is in use in such manner that the parts under stress serve to reinforce each other; for instance, the weight of the user against the back rest is partially directed to maintain the arcuate angle iron members in a horizontal plane against the lower surface of the seat member. The tendency of the arcuate members to break due to the weight of the seat load is counteracted by the even distribution of the load on the arcuate members and also, where a solid seat is used, by the proximity of the upper end of the vertical screw to the bottom of the seat. The acting of the total load downwardly through the threaded sleeve, by reason of its engagement with vertical portions of the legs and the binding of them together lower down, serves to hold the legs closer together as the load is increased. The planting of the leg ends in discs 11 is instrumental in securing a flat base and at the same time prevents scoring of the floor.

The above described embodiments of the invention while particularly adapted for use by switchboard operators in telephone exchanges, are, nevertheless, susceptible of numerous dimensional and proportional modifications to permit their use in other environments, without departing from the scope of the invention as defined by the annexed claims.

What is claimed is:

1. In a chair, a standard comprising a plurality of circular tubular metal rungs, a plurality of curved tubular metal legs held between the metal rungs and having straight upper portions, an internally threaded sleeve secured to the legs at said straight upper portions, and a plate joined to the legs, at least one of said metal rungs located outside of said metal legs and at least one other of said metal rungs located inside of said metal legs.

2. In a chair, a standard composed of a plurality of integral tubular rungs, a plurality of curved tubular metal legs held between said rungs, an internally threaded sleeve welded to the curved tubular legs, a plate joined to the legs, and a disc welded to the lower end of each leg.

3. In a chair, a seat supporting device composed of an arcuate member extending from front to rear having a horizontal and a vertical wall, a vertical screw welded to the vertical wall of the arcuate member, a seat, the bottom surface of which engages the horizontal wall, and a back support fastened to said arcuate member at the front and rear portions thereof.

4. In a chair, a seat, a seat supporting structure including a vertical screw member and a horizontal angle member welded thereto, a metal rod piercing the angle member at one point and welded to said member at another point, and a back rest secured to said metal rod.

5. In a chair, a seat supporting structure including a vertical screw and a supporting member welded to said vertical screw, a metal rod piercing the supporting member at one point and being welded to the same member at another point, a back rest secured to said metal rod, a friction clamp composed of two cooperating leaves embracing between themselves a horizontal portion of the metal rod and being revolvable around same to cause the back rest to be adjustable.

6. An adjustable chair comprising a standard of double ogee-curved tubular legs having straight upper portions, a circular rung welded to the inside of said legs at the lower concave curvature, a rust proof metal rung welded to the outside of the legs at the convex curvature, an internally threaded sleeve welded between the straight upper portions of the legs, a plate closing the upper ends of the legs and joined thereon, a seat, arcuate angle iron members supporting said seat, a vertical screw welded to said arcuate angle iron members and engaging the internally threaded sleeve, a rod piercing said arcuate member at one point and welded to the same member at another point, and an adjustable back rest supported by the rod.

7. In an adjustable chair, a seat member comprising a pair of arcuate angle iron members, a vertical screw welded between the adjacent vertical walls of said arcuate angle iron members, a rod each end of which pierces an arcuate member at a respective point and is welded to said arcuate member at a different respective point, a back rest secured to said rod, and a friction hinge joined to said back rest and causing same to be adjustable.

8. A chair including a standard of curved tubular metal legs having straight upper portions, an internally threaded sleeve welded to said straight upper portions, a plate welded to and closing the upper ends of said legs, a seat, an arcuate angular member extending from front to rear supporting the seat, a vertical screw welded to the angular member and engaging the internally threaded sleeve for adjusting the seat with reference to the standard, and a back support fastened to said arcuate member at the front and rear portions thereof.

9. In an adjustable chair, a seat structure including a plurality of arcuate angle members, a threaded member welded to a vertical side of each angle member, the top of the threaded member being flush with the horizontal side of each angle member, and a standard including a plurality of tubular metal rungs, a plurality of tubular metal legs

positioned between said rungs, a disc welded to each leg at its lower extremity, and an internally threaded sleeve welded to each leg at its upper extremity and engageable with the threaded member of the seat structure to permit adjusting of the seat as to height.

In witness whereof, we hereunto subscribe our names this 28th day of July A. D., 1928.

CLARENCE ALBERT HACH.
FRANCIS ALBERT SANBORN.