

Sept. 5, 1939.

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2,172,019

CHAIR BASE

Filed May 5, 1938

2 Sheets-Sheet 1

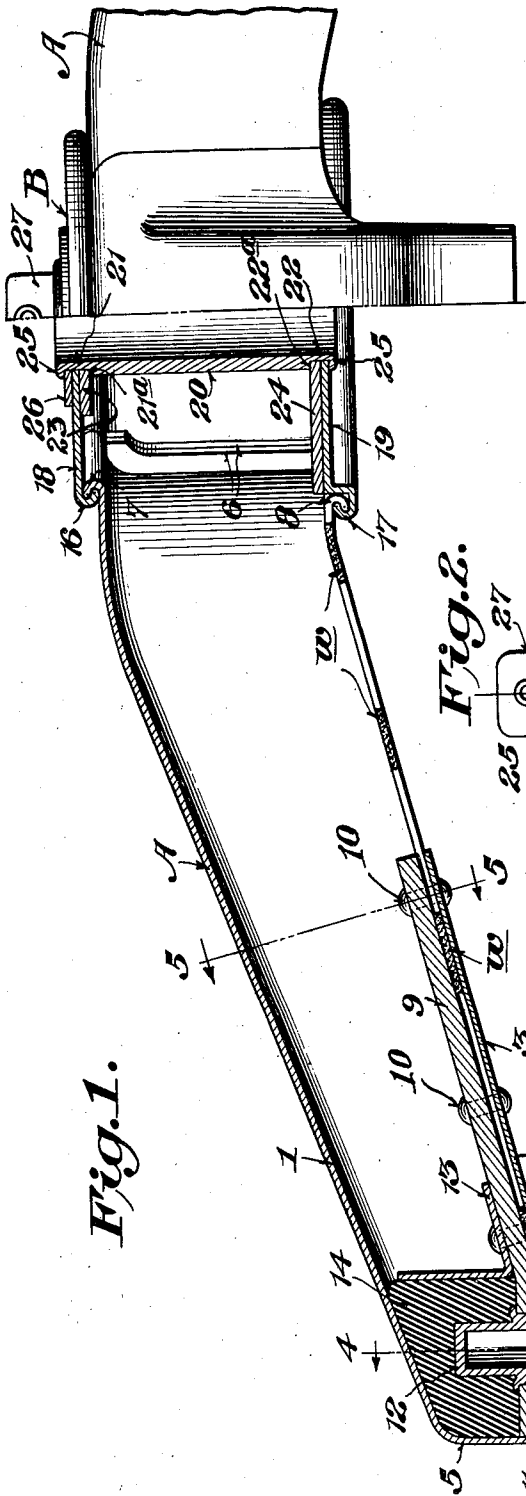


Fig. 1.

Fig. 2.

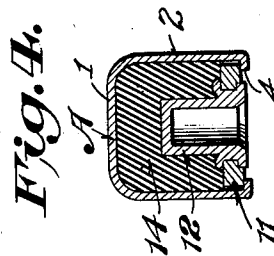
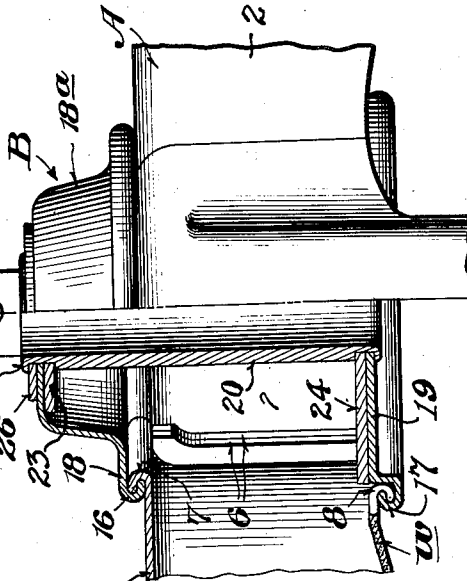
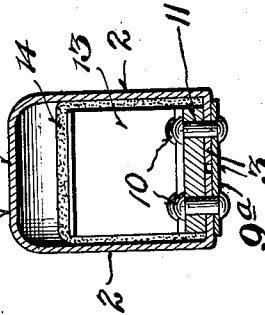


Fig. 4.

Fig. 5.



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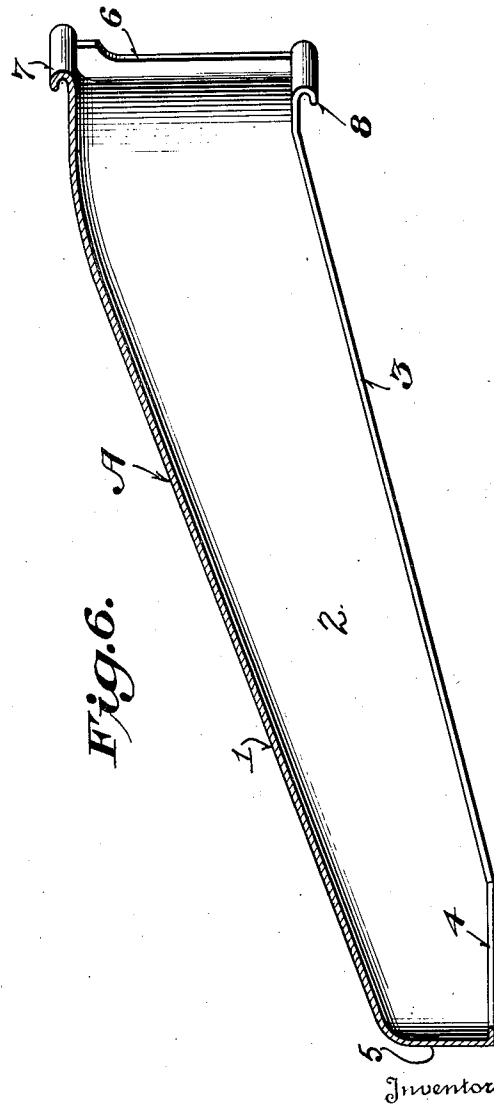
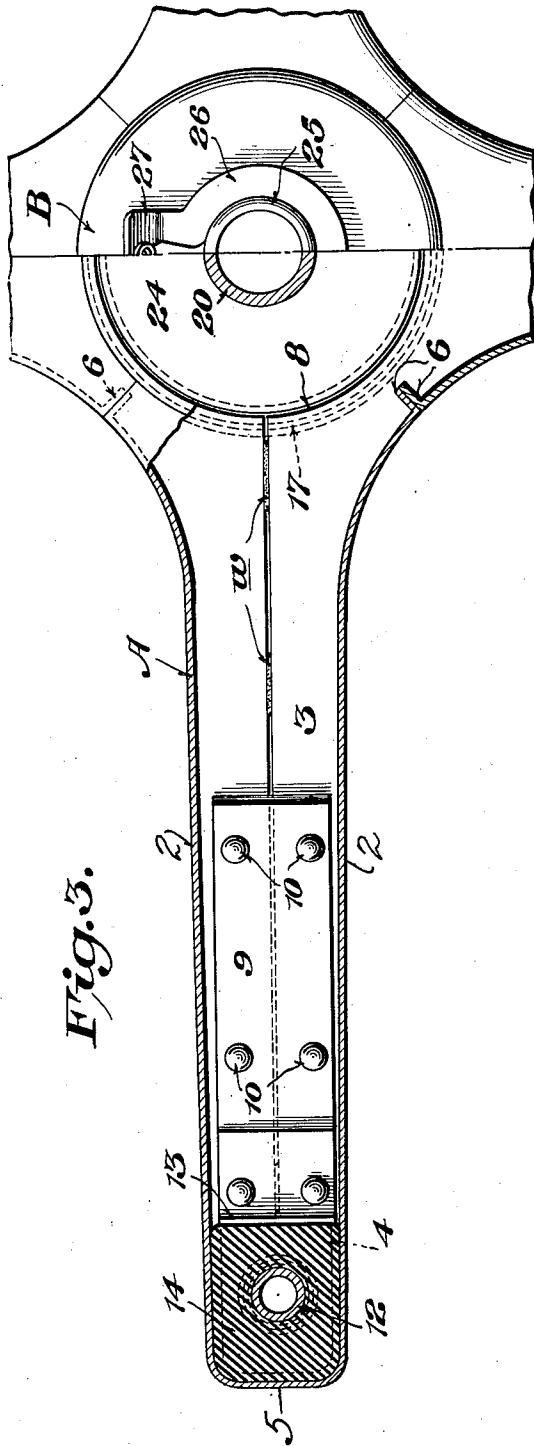
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CHAIR BASE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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CHAIR BASE

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Application May 5, 1938, Serial No. 206,268

5 Claims. (Cl. 155—138)

This invention relates to chair bases, and more particularly to bases for swivel chairs.

The lightness, permanence, and other advantages of aluminum for furniture use are well known, and when used in the form of tubing for the framework of chairs, tables and the like, no reinforcement is needed. However, when aluminum sheets are formed into radial legs assembled in spoke like formation for swivel chair bases, it is desirable to provide suitable reinforcement of steel. While it is good practice to make chair bases of one-piece by a single stamping, nevertheless, this practice requires the use of relatively large sheets of aluminum, and is therefore expensive in the respect that the metal cut away between the legs is useful only for scrap even though the stampings may be economically laid out on the sheet.

Accordingly, the present invention has for one of its objects, a chair base made of aluminum whose legs are steel reinforced at the outer ends where the casters are located and also at the center or hub which supports the chair spindle tube, the construction being such that chair bases of different height may be made by using different forms of top, or cap plates for the hub.

Another object of the invention is to make the legs separately from relatively small sheets of aluminum, secure them together and connect them with top and bottom plates by suitable spun joints, said plates in turn being held together in vertically spaced relation by a steel tubular spindle and a washer plate assembly.

A further object of the invention is to provide novel caster supports of relatively extended area which not only assume and distribute the load adequately throughout each of the legs but at the same time have associated therewith suitable sound deadening means such as rubber or the like, thereby rendering the chair noiseless as it is moved over the floor. In other words, the noise effects of caster operation are not transmitted through the hollow metal legs in the form of amplified sound.

With the above and other objects in view which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangements of parts hereinafter more fully described, illustrated and claimed.

A preferred and practical embodiment of the invention is shown in the accompanying drawings in which:

Figure 1 is a vertical sectional view partly in elevation illustrating the present improvements.

Figure 2 is a detail vertical sectional view of a modified hub structure illustrating the use of a top or cap plate with a raised central portion to provide a chair base of greater central height.

Figure 3 is a partial plan view of the base; one of the legs being shown in horizontal section, and the opposite leg being shown in plan.

Figure 4 is a vertical sectional view taken on the line 4—4 of Figure 1.

Figure 5 is a vertical sectional view taken on the line 5—5 of Figure 1.

Figure 6 is a longitudinal sectional view of one of the legs.

Similar reference characters designate corresponding parts throughout the several figures of the drawings.

According to the embodiment of the invention shown in the drawings, the construction includes the leg members A and hub B.

The leg members A are formed with the top walls 1, side walls 2 and inturned bottom walls 3, the latter terminating short of the outer end of the leg to provide an opening 4 which is masked by the side walls 2—2 and the end wall 5 at the outer end of the leg. The inner ends of the legs are preferably of outwardly flaring formation and are provided with the vertical flanges 6 and the horizontal outwardly curved top and bottom flanges 7 and 8. The mating edges of the inturned bottom walls 3 may be welded together as indicated at *w* in Figure 3, and near their outer ends are provided with an interior caster support 9. This support is preferably a steel strap or bar of sufficient width to span the inside of joint between the adjacent edges of the flanges 3—3, and the outer side of the flanges are backed up by a steel reinforcing strip 9a so that the rivets or other fastenings 10 are anchored to steel plates. This arrangement distributes the force exerted at the rivet heads to relieve the strain on the aluminum flanges 3. The body of the bar 9 parallels the said flanges and its outer end 11 is bent into a horizontal position and formed with an opening for receiving a caster socket 12. This socket is swaged, riveted or otherwise securely fastened in the bar 9 at the location of the opening 4 to be readily accessible to the caster spindles.

The upper face of the reinforcing bar 9 carries therewith an angle plate 13 whose substantially vertical wall cooperates with the outer end wall 5 and side walls 2 to provide in effect a compartment or enclosure for receiving a molded rubber packing or filler 14 which surrounds the caster socket 12 and completely fills the space

in the end of the leg. The effect of the molded rubber filler or packing 14 is to prevent, by absorption, the transmission and amplification of noise incident to caster operation through the hollow leg.

The legs A after being completed in the form above set forth are ready for assembly into chair base formation. That is to say, the vertical flanges 6—6 of each leg are placed in abutting relation and welded together. Thus, the several leg members A become united in spoke-like fashion to provide radiating legs which constitute the chair base. When the leg members A are assembled in this fashion the out-turned top and bottom flanges 7 and 8 provide in effect a continuous groove which is intended to receive the mating inturned flange portions 16 and 17 of the aluminum top and bottom housing plates 18 and 19 of the central hub structure B, in a manner to be later described.

The said hub structure B includes a central tubular member or spindle receiving bushing 20 of steel having its opposite outer end portions 21 and 22 of externally reduced diameter providing interior shoulders 21^a and 22^a. A steel reinforcing member or washer plate 23 is fitted over the reduced end 21 of the bushing 20 to abut the shoulder 21^a. Similarly, another steel reinforcing member or washer plate 24 is fitted over the reduced lower end portion 22 of the bushing to abut the shoulder 22^a. The top and bottom plates 18 and 19, being provided with suitable openings, are also fitted over the reduced ends 21 and 22 of the bushing and the outer edges of said reduced ends are peened, or otherwise turned inwardly as indicated at 25 to firmly lock the aluminum top and bottom plates and the reinforcing washers rigidly in position.

In the case of the top housing plate 18 it is also preferred to use an outer washer element 26 having an offset bracket 27 provided with a threaded opening to receive a set screw for holding the usual nut which forms part of the spindle adjusting means. This nut anchoring washer 26 is secured to the bushing 20 by the flanged over portion 25 at the top of the tube.

In the event that it is desired to make a hub structure of greater height than that shown in Figure 1, the top housing plate 18 of the hub structure may be made with a raised or arched central portion 18^a as shown in Figure 2. The hub structure, in this way, simply requires the use of a longer tube 20 but the same structural features prevail. That is to say, the top housing plate 18^a is rigidly interlocked with the tubular member or bushing 20 in the same manner as the plate 18 and the bottom housing plate 19 is also fixed to the tubular member or bushing in the same way as in Figure 1.

In making the chair base, the legs A are first formed with the top, side, and end walls and bottom flanges 3 as well as the flanges 6. The latter flanges of each leg are then welded together. The aluminum top plate 18 is next put in place and securely fastened by spinning the edge 16 into the groove formed by the top flange 7 of the leg after which it receives a special treatment. Then the caster holding assembly including the parts 9, 12, 13 and 14 are inserted through the lower open end of the hub structure and slid down into the leg toward the end wall 5. When the rubber cushion 14 is firmly in contact with the end of the leg, the rivets 10 are secured in the body 9 of the caster retainer bar and the steel plate 9a.

The top reinforcing washer 23 is then fitted over the reduced end 21 of the bushing 20 and the said reduced end 21 is pushed through the central opening in plate 18 thereby to receive the nut anchoring washer 26. The bottom reinforcing washer 24 is next fitted over the reduced end 22 of the bushing 20 and then the bottom plate 19 is also fitted over the said reduced portion 22 of the bushing and the edge 17 thereof is spun into the grooves provided by the bottom flanges 8 of the leg members.

The peripheral edges of the reduced ends 21 and 22 of the bushing 20 are peened, or otherwise turned outwardly as indicated at 25 to complete the hub assembly.

From the foregoing, it will be apparent that the present invention provides for making the individual hollow legs of the chair base from relative small pieces of aluminum while at the same time adequately reinforcing them at their outer ends where the casters are located, and, at the same time, permitting of their union with a hub structure whose aluminum top and bottom plates are reinforced by steel washer plates to adequately distribute the load transmitted to the base through the threaded spindle receiving tube. By connecting the individual legs to each other through the vertical flanges 6 all of the legs are rigidly connected in a lateral direction, the flared end walls contributing materially to the bracing effect laterally of each of the individual legs.

Also, by providing a hub structure which includes top plates of the type of 18 and 18^a which are readily interchangeable in the course of manufacture, it is possible to make chair bases of different heights to adequately provide for mounting the seat of the chair the desired distance from the floor whether swiveled casters are used or not. Moreover, the caster sockets are rigidly carried in a steel mounting as distinguished from an aluminum mounting, thereby adding to the rigidity of the caster supports.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will, of course, be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention and scope of the appended claims.

I claim:

1. A chair base including a plurality of light sheet metal leg members, each having at their inner end, outwardly flaring side walls provided with vertical inturned flanges, and also provided with top and bottom flanges extending inwardly of said vertical flanges and having outwardly curled edge portions, said vertical flanges arranged in abutting relation and secured together and the outwardly curled portions of said top and bottom portions forming in effect continuous grooves; and a hub structure including a central tube of reduced outer diameter at its ends to provide inner shoulders, upper and lower reinforcing plates abutting said shoulders, top and bottom housing plates made of light sheet metal, each having an opening to fit over the reduced portions of the tube and each having peripheral continuous inturned flanges spun into said grooves formed by the outwardly curled edge portions of the flanges at the top and bottom of the legs, said lower reinforcing plate being substantially co-extensive with the bottom housing plate to equalize the distribution of load imposed on the tube, said housing plates being disposed against the

outer faces of the said reinforcing plates, a nut anchoring washer fitted over the outer face of the top housing plate and having a vertical lug provided with an aperture, and the upper and lower edges of the reduced ends of the tube being bent into engagement with the bottom housing plate and said nut anchoring washer respectively, thereby to clamp the housing plates and reinforcing plates in rigid engagement with the shoulders on the tube.

2. A chair base including hollow leg members made of aluminum each having top, side and bottom walls, the latter provided at the outer end of the leg with an opening for receiving a caster socket, a steel reinforcing and load assuming bar extending along the inner faces of and secured to the bottom walls and projecting across the said opening, and a caster socket secured in said bar.

3. A chair base including hollow leg members made of aluminum each having top, end, side, and bottom walls, the latter provided at the outer end of the leg with an opening for receiving a caster socket, a steel reinforcing and load assuming bar extending along the inner faces of and secured to the bottom walls and projecting across the opening, a caster socket secured in said bar, and a sound absorbing packing filling the

outer end of the leg and surrounding said caster socket.

4. A chair base including hollow leg members, each having top, end, side, and bottom walls, the latter provided at the outer end of the leg with an opening, a reinforcing bar secured to the bottom walls and projecting across the opening, a caster socket secured to said bar at the opening, an angle plate secured to said bar at one side of the caster socket, and a molded rubber packing surrounding said caster socket and confined in the space between said angle plate and the walls at the end of the leg.

5. A chair base including hollow aluminum leg members, each having top, end, side, and bottom walls, the latter extending horizontally toward each other and welded together, said bottom walls terminating short of the end wall of the leg to provide an opening, a steel reinforcing bar having a body portion paralleling said bottom walls and spanning the adjacent edges thereof and also having a horizontal portion arranged across said opening, fastenings for securing said body portion to the bottom walls, a caster socket secured to said horizontal portion of the bar, and a sound absorbing packing fitted in the outer end of the leg and surrounding the caster socket.

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