July 6, 1926. **1,591,110**

H. C. WILLSON

BASE FOR STOOLS AND OTHER ARTICLES OF FURNITURE

Filed July 3, 1924 2 Sheets-Sheet 1

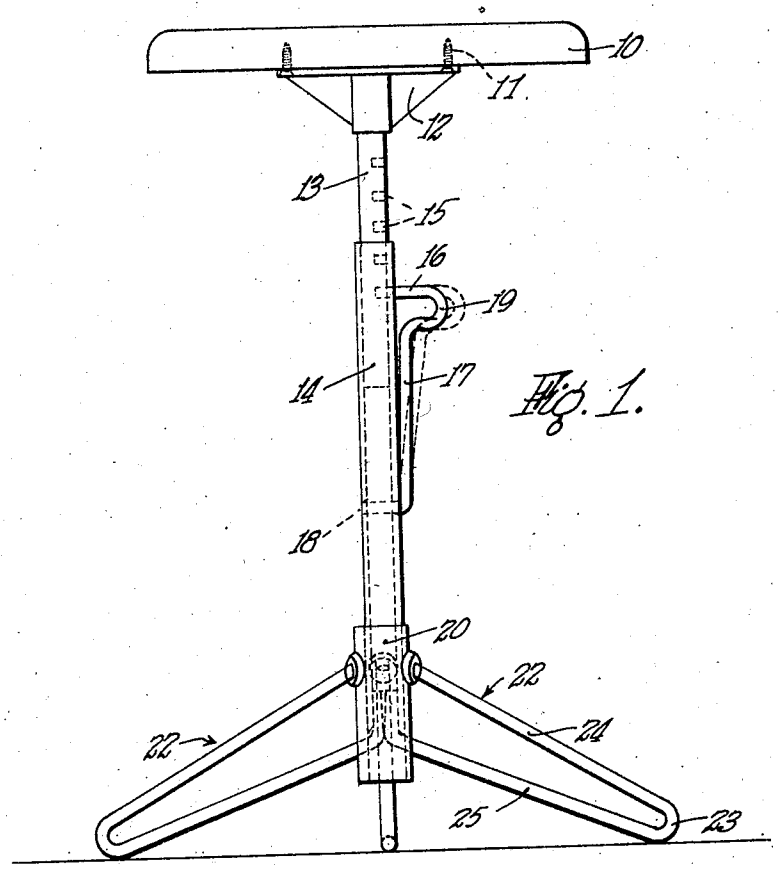


Fig. 1.

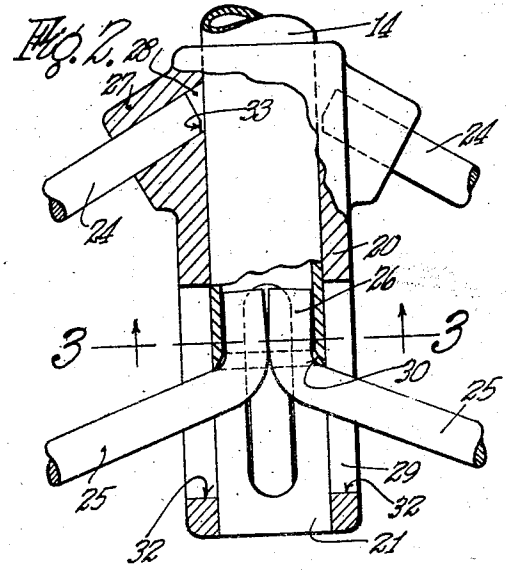


Fig. 2.

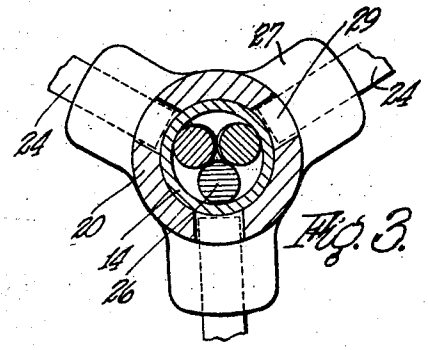


Fig. 3.

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Fig. 4.

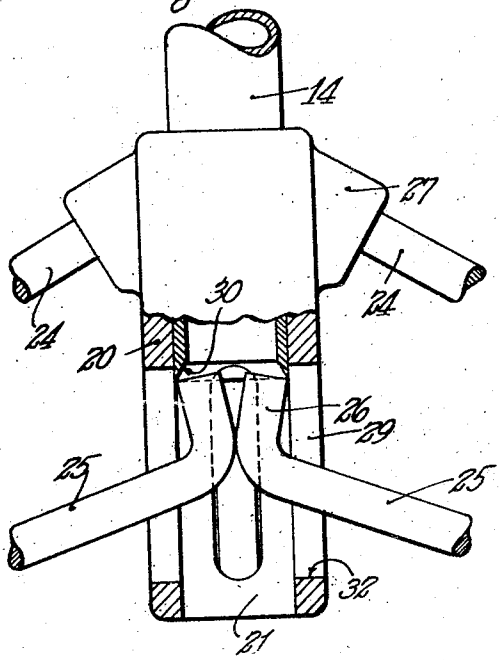


Fig. 5.

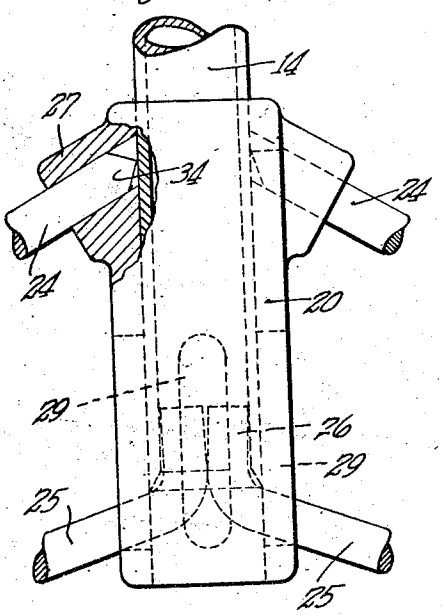


Fig. 6.

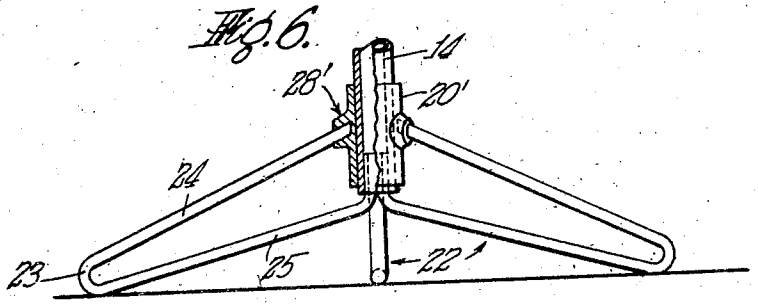
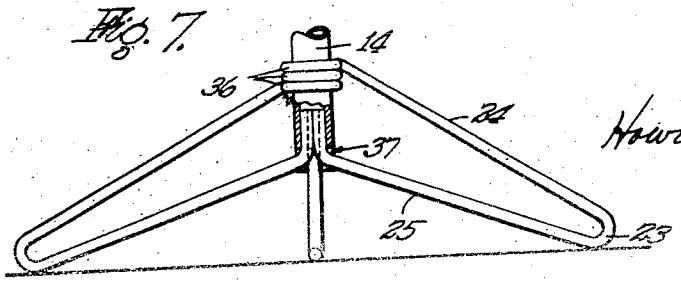


Fig. 7.



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UNITED STATES PATENT OFFICE.

HOWARD C. WILLSON, OF NEWTON HIGHLANDS, MASSACHUSETTS.

BASE FOR STOOLS AND OTHER ARTICLES OF FURNITURE.

Application filed July 3, 1924. Serial No. 723,996.

This invention relates to improvements in bases for stools and other articles of furniture.

In certain respects this invention is an improvement on that disclosed in my U. S. Letters Patent, 1,453,650, granted May 1, 1923. That is the present invention contemplates, and has for an object to provide, a base for any article of furniture which base can be shipped in "knocked down" form and assembled without the use of any tools. The parts of the base are held together without the use of pins, screws, bolts, or the like, and are so interengaged as to be self sustaining.

In another aspect, the invention contemplates, and has as object to provide, an improved base which will have resilient qualities and this feature of the invention is especially applicable to stools and like articles which are used to sit upon.

In connection with the resilient base construction, it is also an object of the invention to provide means for limiting the extent of the resilient movement and such means may be in the nature of fixed stops or the result may be obtained by applying a braking action to the downward movement of the standard, or both these forms may be used conjointly, the braking action serving to gradually arrest the downward movement and cause less abrupt engagement with the stops.

Other features of the invention will appear in the following description and in the accompanying drawings, in which—

Fig. 1 is an elevational view of a stool embodying my invention;

Fig. 2 is an enlarged fragmentary view, partly in section, illustrating the details of the spring base construction;

Fig. 3 is a sectional plan view taken on the line 3—3 of Fig. 2;

Fig. 4 is a view taken similarly to Fig. 2 illustrating the manner in which the parts of the base are assembled;

Fig. 5 is a view, taken similarly to Fig. 2 and illustrating a modification of the invention, designed for use when the resilient qualities are not necessary or desired; and

Figs. 6 and 7 are views taken similarly to Fig. 2 and illustrating modifications in the spring base construction.

In these drawings, there is shown, as an illustrative example of one of many articles of furniture with which my invention may be used, a stool. The invention, being concerned with the base construction, is independent of the constructural details of other parts of the stool.

I prefer, however, to construct the stool in the manner shown because, with the illustrated construction, the parts of the stool may be readily shipped in "knocked down" form and easily assembled. The stool comprises a wooden top or seat 10 secured, as by screws 11, to a bracket 12. The latter is suitably fixed to the upper end of a post 13 which is slidably received in the open upper end of a hollow standard 14. The post and standard are employed when vertical adjustment of seat 10 is required. If such adjustment is not required one of these elements may, obviously, be dispensed with. As an example of one means for securing the vertical adjustment, the post 13 is provided with a vertical series of holes 15 and a pin 16, entering through a hole in the standard 14 near its upper end, may be engaged in any of this series of holes, whereby to hold the post and standard together in various positions of vertical adjustment. The pin 16 is formed on one end of a bent spring wire 17,—the other end passing diametrically through the standard and being suitably secured thereto, as by riveting the end 18. A loop 19 is preferably provided to afford a convenient grip for use in withdrawing the pin 16, when required.

The base of this invention includes in addition to the standard 14, a member 20, preferably in the nature of a casting having a central bore 21 to freely receive the lower end of standard 14, and a series of legs 22. Each of these legs is made up from a large wire or rod, preferably of round cross section, by bending the wire intermediate its end, as at 23, forming upper and lower arms 24 and 25, respectively, both disposed in the same vertical plane. The free ends of the lower arms 25 are upturned, substantially vertically, as indicated at 26. The member 20, which is slidably engaged in standard 14, is provided with a series of radiating hubs 27, in which are formed openings 28 leading from the bore 21 radially outwardly and with a downward slope. These openings freely receive the free ends of the upper arms 24. Below the openings 28, an

equal number of vertical slots 29 are provided in the member 20, which slots are large enough to permit the upturned ends 26 of the lower arms 25 to be passed therethrough into the bore 21, as illustrated in Fig. 4. Preferably, the ends 26, when thus brought into grouped relation, have their upper extremities slightly outturned, as illustrated in somewhat exaggerated form in Fig. 4. The lower end of standard 14 is preferably interiorly tapered, as at 30. The parts, when positioned as in Fig. 4, are finally connected together by forcing down the standard 14, the bevelled end 30 camming the outturned ends 26 inwardly after arms 25 abut the lower walls of slots 29. Continued pressure on the standard drives these ends 26 into the open lower end of standard 14 and forces them into closely abutting relation, as shown in Fig. 2. The grouped ends 26, being biased to diverge upwardly, firmly grip the interior wall of standard 14, whereby the parts cannot readily loosen and fall apart when pressure on the standard is relaxed.

The normal positions of the parts, assembled as described, is shown in Fig. 2 and it will be noted that the slots 29 extend below arms 25 to an appreciable extent. With this condition in mind and bearing in mind that standard 14 is capable of freely sliding in member 20, it will be seen that when weight is applied to the standard, it depresses arms 25, which flex about the floor engaging parts 23, as fulcrums and the weight is balanced against the resiliency of these arms, giving a spring support for the standard. The upper arms 24 act as struts to support the member 20 from the floor during the action described.

It is desirable to limit the degree of flexure of the lower arms. Otherwise, an abnormally heavy load on seat 10 might cause the arms 25 to flex beyond their elastic limits and break. For this purpose, I provide closed lower walls for slots 29, forming stops 32 against which arms 25 may abut to limit the downward movement of standard 14. As another means of arresting the downward travel of standard 14, the end faces of the free ends of arms 24 may be allowed to have access to the outer periphery of standard 14. With this arrangement, the downward flexure of arms 25 tends to force the end faces of arms 24 against the standard 14, and the frictional engagement acts like a brake to retard the downward movement of standard 14. The end faces of arms 24 preferably have portions 33, which are parallel to the axis of standard 14, so that these faces rub against, rather than dig into the standard. Desirably the stops and braking means are used in conjunction, the latter serving to retard the downward movement of the standard as arms 25 approach stops 32. In this manner an undesirable abrupt termination of the downward movement of standard 14 is avoided.

In the event that the spring action is not desired or needed, as in the case of costumers, taborets, stands and the like articles of furniture, the same construction may be used except that the slots 29 are decreased in length so as not to extend materially below arms 25 in their normal unflexed positions. This condition is illustrated in Fig. 5 and the construction there shown has all the desirable features relating to simplicity of construction and ease of assembly of parts, as the construction already described. With the construction shown in Fig. 5, the end faces of the free ends of the upper arms 25 may be bevelled, as at 34, so as to dig into the standard 14 when weight is imposed thereon, as described in my prior patent, above identified, whereby an extremely rigid base construction is provided.

In Fig. 6, I have illustrated another construction of spring base, wherein the resilient support may be had without the use of the stops or the braking effect. In this construction the member 20′ is formed in much the same manner as disclosed in the above identified patent but is freely slidable on the standard 14. The openings 28′, which receive the free ends of the upper arms 24 do not extend entirely through the member 20′ and they consequently do not exercise any braking effect on the downward movement of the standard 14. The member 20′ terminates short of the lower end of the standard and arms 25 pass below, but not through, the member 20′. The free ends of arms 25 are, however, upturned and wedged into the lower open end of standard 14, as in the above mentioned prior patent. In operation, the weight on standard 14 depresses it and causes arms 25 to flex in the same manner, as already described.

It is not necessarily essential that the upper arms 24 be connected to a separate member, such as the casting 20. The essential thing is that some means be provided at the ends of such arms which will permit the standard 14 to move downwardly relatively thereto. For example, as shown in Fig. 7, the member 20 may be omitted and, as its equivalent, a circularly bent part 36 may be formed on each upper arm which part is slidably engaged with the standard. These parts 36 will rub against the standard when the lower arms 25 are flexed and effect a braking action, in a manner analogous to that above described. With the arrangement shown in Fig. 7, the lower end of standard 14 would be provided with notches 37 in which the lower arms 25 are engaged to locate and space them angularly relatively to the standard.

The base construction described is such

that the several parts may be readily and conveniently assembled without the use of tools. Indeed, the entire stool construction is designed with this end in view and no more than a screw driver would be required to fasten the seat 10 to bracket 12. The stool may be shipped in compact "knocked down" form and easily and quickly assembled when required. The construction of the stool is also such as to lend itself to quantity production at low unit cost.

The spring base construction is a most desirable feature in stools and the like, as distinguished from a rigid base. When one sits down on the seat 10, it yields gradually until the weight imposed on the seat is balanced by the force of the spring arms 25. The practical effect is the same as when one sits down on a soft yielding cushion and the yielding feature adds considerably to the merits of the stool without adding to its manufacturing cost.

The invention has been disclosed herein, for illustrating purposes but the scope of the invention is defined by the appended claims rather than by the foregoing description.

What I claim is:

1. A spring base for stools and the like, comprising in combination with a vertical standard, a series of wire legs each bent to form an upper and a lower arm, and a part connected to the free end of each upper arm and slidably engaged with said standard, the free ends of the lower arms being fixed to said standard, whereby when weight is imposed on the standard the latter slides downwardly relatively to said upper arms and flexes said lower arms.

2. In an article of furniture, the combination of a hollow vertical standard, a member slidably engaged with the standard near its lower end and having a plurality of radial openings, and a plurality of legs one for each of said openings and each consisting of a wire bent near the center and having two separate arms in the same vertical plane, the ends of the upper arms being engaged in said openings and the ends of the other arms being substantially vertically upturned and engaged within said hollow standard.

3. A spring base for stools and the like, comprising in combination with a vertical standard, a series of wire legs each bent to form an upper and a lower arm, and a part connected to the free end of each upper arm and slidably engaged with said standard, the free ends of the lower arms being fixed to said standard, whereby when weight is imposed on the standard the latter slides downwardly relatively to said upper arms and flexes said lower arms, and means for limiting the extent of said downward sliding movement.

4. A spring base for stools and the like, comprising in combination with a vertical standard, a series of wire legs each bent to form an upper and a lower arm, a part connected to the free end of each upper arm and slidably engaged with said standard, the free ends of the lower arms being fixed to said standard, whereby when weight is imposed on the standard the latter slides downwardly relatively to said upper arms and flexes said lower arms, stops for limiting the extent of said downward sliding movement, the flexure of said lower arms causing the free ends of the upper arms to bear against the standard and gradually retard the downward movement of said standard as it approaches said stops.

5. A spring base for stools and the like, comprising in combination with a vertical standard, a series of wire legs each bent to form an upper and a lower arm, a part connected to the free end of each upper arm and slidably engaged with said standard, the free ends of the lower arms being fixed to said standard, whereby when weight is imposed on the standard, the latter slides downwardly relatively to said upper arms and flexes said lower arms, the flexure of said lower arms causing the free ends of the upper arms to bear on the standard and apply a braking effect on said standard as it moves downwardly, whereby to gradually increase the resistance to its downward movement.

6. In an article of furniture, the combination of a hollow vertical standard, a member slidably mounted thereon near its lower end and having a series of radial openings therethrough, and a series of legs each comprising a wire bent intermediate its ends to form upper and lower arms, the free ends of the upper arms being slidably received in said openings and the free ends of the lower arms being fixed to said standard, whereby when weight is imposed on the standard the latter moves downwardly through said member and flexes said lower arms and causes the ends of the upper arms to move inwardly in said openings against said standard.

7. In an article of furniture, the combination of a hollow vertical standard, a member slipped over and slidably engaged with the standard near its lower and, said member having a series of radial openings therethrough and a series of vertical slots therethrough below said openings, and a series of legs each comprising a wire bent intermediate its ends to form upper and lower arms, the free ends of the lower arms being upturned substantially vertically, the free ends of the upper arms being slidably received in said openings, the upturned ends of the lower arms passing through said slots and engaged within the lower end of said hollow standard.

8. In an article of furniture, the combina-

tion of a hollow vertical standard, a member slipped over and slidably engaged with the standard near its lower end, said member having a series of radial openings therethrough and a series of vertical slots therethrough below said openings, and a series of legs each comprising a wire bent intermediate its ends to form upper and lower arms, the free ends of the upper arms being slidably engaged in said openings and the free ends of the lower arms being upturned and passed through said slots into grouped and substantially abutting relation with their upper extremities slightly outturned, whereby when the hollow standard is passed through said member it may be driven over said grouped ends and held thereto by the grip of said outturned extremities on the interior wall of said standard.

In testimony whereof I have affixed my signature.

HOWARD C. WILLSON.