Oct. 8, 1946. A. M. STARCK 2,409,075

EXTENSIBLE STAND

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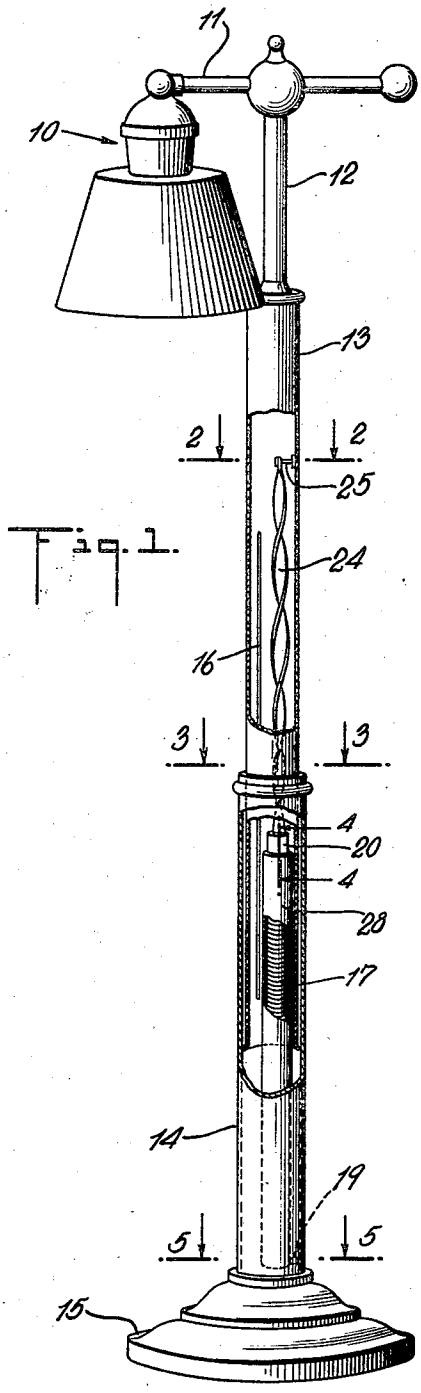
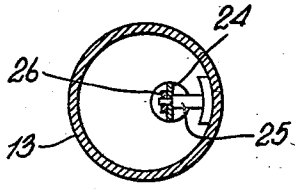


Fig. 1.

Fig. 2.



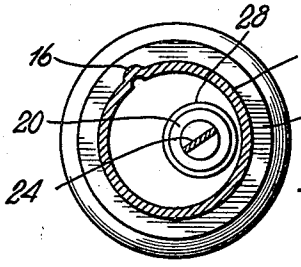


Fig. 3.

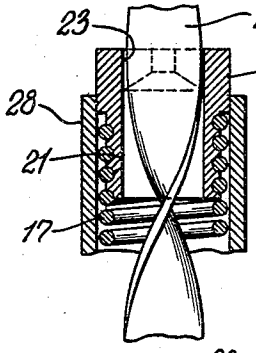


Fig. 4.

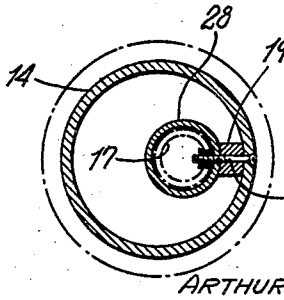


Fig. 5.

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EXTENSIBLE STAND

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2 Claims. (Cl. 248—161)

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This invention relates to adjustable stands and more particularly to stands for lamps, microphones, music supports and the like.

Stands for lamps and the like have been made vertically adjustable by various constructions which usually employ clamping screws that have the disadvantage of requiring loosening and tightening each time it is desired to change the height adjustment. Screws are furthermore difficult to operate and detract from the appearance of the stand. The unbalanced weight of the vertically movable part of a stand causes considerable effort to be required to raise it and also makes it difficult to obtain accurate adjustment.

Principal objects of the present invention are to provide an improved stand for lamps and the like which is easily adjustable in height, which needs only to be pushed down or up to adjust its height, and which will remain at the adjusted height without the use of clamping screws. Other objects of the invention are to provide an adjustable stand of the type in which the upper portion is vertically movable with respect to the lower portion; in which the weight of the upper portion is counterbalanced; in which the counterbalancing device is completely enclosed within telescoping tubular members of the stand; and in which a spring is employed as a counterbalancing element in such a manner that the variation in force exerted by the spring may be compensated.

Other objects of the invention will in part be obvious and will in part become apparent from the following detailed description of one embodiment thereof, in which:

Figure 1 is an elevational view of an exemplary lamp stand according to the invention, with parts broken away to show the interior construction;

Figure 2 is a view of a section taken on the line 2—2 of Figure 1 showing the upper anchor of the counterbalance device;

Figure 3 is a view of a section taken on the line 3—3 of Figure 1 showing the counterbalance and means to prevent relative rotation between telescoping members;

Figure 4 is a view of a section taken on the line 4—4 of Figure 1 showing the guide between the spiral ribbon and the spring; and

Figure 5 is a view of a section taken on the line 5—5 of Figure 1 showing the lower anchor of the counterbalance device.

As a preferred example the stand device of the present invention is incorporated in a floor lamp or bridge lamp. The device to be supported is

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embodied in a lamp 10 secured in a customary manner at the end of a cross arm 11 of a post 12 which is mounted on top of an upper telescope tube 13. The tube 13 telescopes within a lower tube 14 which has an inner diameter only slightly greater than the external diameter of the tube 13. The tube 14 is vertically supported by suitable means such as a base 15. It is desirable to provide means for preventing relative rotation between the tubes 13 and 14 and for such purpose a spline or longitudinal ridge 16 is formed in the wall of the tube 13 and a corresponding cooperating groove is formed in the tube 14.

The function of the counterbalance device is to stabilize the weight of the movable part of the stand, that is, the tube 13 and the parts supported thereon. The counterbalance device is disposed entirely within the tubes 13 and 14, and it includes a helical torsion spring 17 having its lower end secured by a bolt 18 to the lower end of the tube 14. A spacer 19 is disposed between the wall of the tube 14 and the spring 17. The spring 17 extends to a point near the upper end of the tube 14 and has secured to its upper end a cap piece 20 by engagement of the upper coils of the spring in threads 21 formed in the cylindrical part of the cap. In the upper portion of cap 20 there is provided a slot-shaped opening 23 the longer dimension of which is substantially equal to the inner diameter of the cylindrical part of the cap piece.

Through the slot 23 extends an auger-like or ribbon-like spiral member 24 such as may be formed by twisting a rectangular flat strip of metal. The twist or pitch of the spiral however, is not uniform for reasons hereinafter described. The length of the spiral member 24 is slightly greater than the length of the spring 17 and it extends upward into the tube 13 to which it is anchored at its upper end. A stud 25 is secured to the inside wall of the tube 13 and the end of the stud is threaded to receive a nut 26 which clamps the upper end of the member 24 to the stud. When the member 24 is forced into the spring 17, the cap 20 is rotated and such rotation twists the spring 17. When the member 24 and tube 13 are stationary, the tension of the spring 17 reacts on the helical elements or surfaces of the member 24 and tends to force it upwardly. The pitch of the member 24 and the strength of the spring 17 are selected so that the upward force on the member 24 is sufficient to balance the weight of the tube 13 and elements carried thereby.

When a torsion spring is twisted, its tension

changes in accordance with the spring characteristic. Therefore, the rotary force on the cap 20 changes at different positions of member 24, but the weight to be counterbalanced will in most cases be constant. In order to compensate for the effect of spring characteristic the pitch of the member 24 is varied so that it is coarser at the upper portion than at the lower portion. Thus when the cap 20 is in the upper region of the member 24, the coarse pitch in conjunction with the greater tension of the spring 17 will provide an upward thrust in member 24 which is about the same as the upward thrust which is obtained by the weaker tension in conjunction with the finer pitch when the cap 20 is in the lower region of the member 24.

While not essential, it is found advantageous to enclose the spring 17 within a guide tube 28 in which the cap 20 and spring 17 are rotatable and which is secured between the spacer 19 and the end of the spring 17 by bolt 18. A limited degree of adjustment of the counterbalance device according to the weight to be supported is obtainable by presetting the initial tension of the spring 17 as by giving the lower end the requisite number of turns before securing it by the bolt 18.

It will be seen that the lamp may be moved up and down with equal ease, that such movement will be smooth, and that only a minor amount of friction between the movable and stationary parts suffices to hold the lamp firmly in any adjusted position.

It will be understood that in the disclosure described above, various modifications may be made without affecting the principle of the invention; further that the invention is not to be considered as limited to the embodiment which is described herein only for purposes of illustration, but solely by the terms of the appended claims.

What is claimed is:

1. In a telescoping stand having stationary and movable relatively non-rotatable portions, a device for counterbalancing the weight of the movable portion, said device comprising a helical compression spring non-rotatably secured at one end to the stationary portion, a cap member rigidly secured to the other end of said spring, and an elongated member non-rotatably secured at one end to the movable portion and provided with a helical element extending through and threadedly engaging said cap member to torsion said spring, said cap member reacting under the torsional force of said spring to provide a vertical force adapted to support the weight of said movable portion.

2. In a telescoping stand having stationary and movable relatively non-rotatable portions, a device for counterbalancing the weight of the movable portion, said device comprising a helical compression spring non-rotatably secured at one end to the stationary portion, a cap member rigidly secured to the other end of said spring, and an elongated member non-rotatably secured at one end to the movable portion and provided with a helical element extending through and threadedly engaging said cap member to torsion said spring, said cap member reacting under the torsional force of said spring to provide a vertical force adapted to support the weight of said movable portion, said element having a variable pitch, said pitch being greatest at the end farthest removed from the spring and least at the end which enters the spring.

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