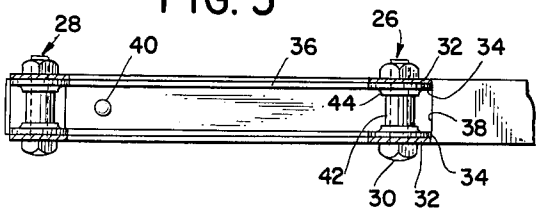
Nov. 23, 1965 O. H. STRYKER 3,219,303

EQUIPOISED LAMP

Filed Jan. 16, 1964

FIG. 5



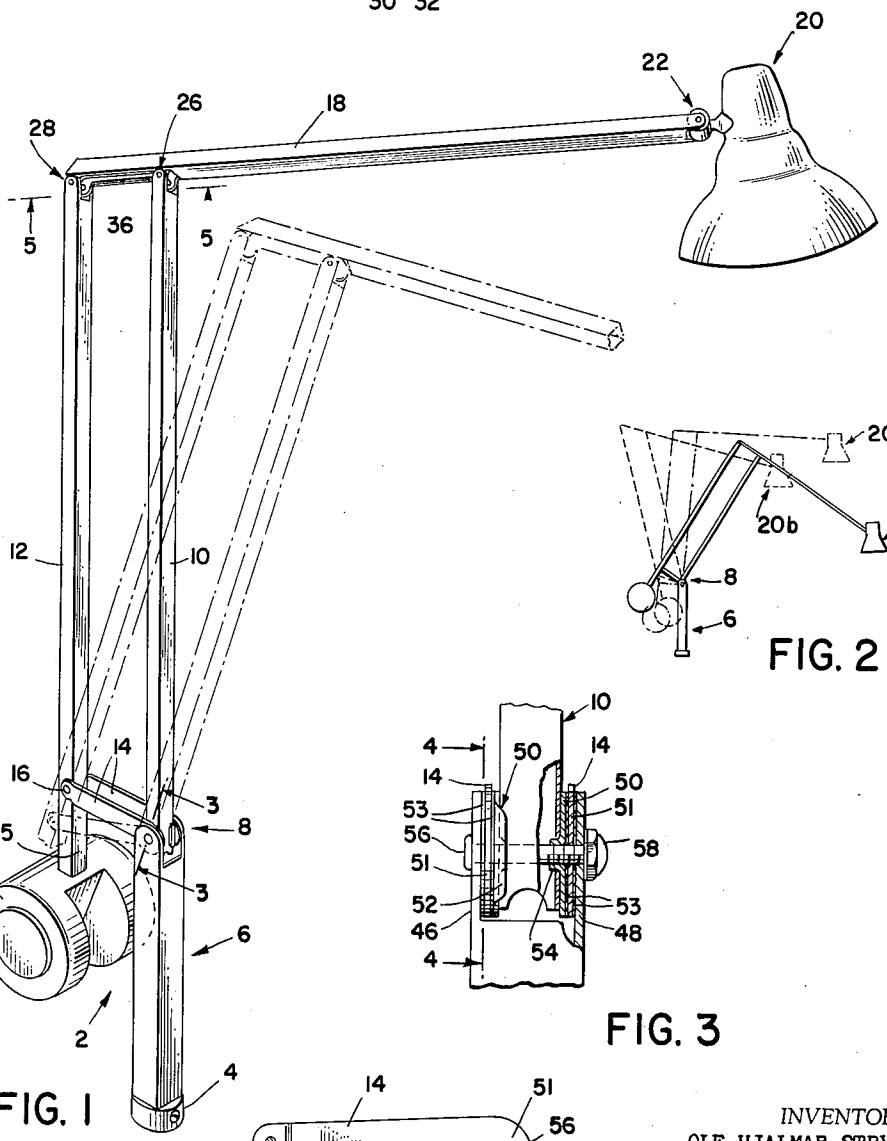


FIG. 1

FIG. 2

FIG. 3

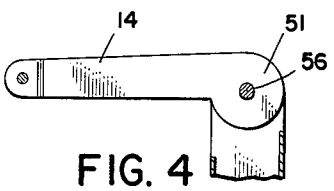


FIG. 4

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EQUIPOISED LAMP

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This invention relates to equipoised lamps, and more in particular to such lamps wherein friction means is provided to assist the counterbalancing mechanism in holding the lamp head or lamp assembly in a selected position.

An object of this invention is to provide an improved lamp construction of the type having a lamping assembly which may be moved to a selected position where it will remain until moved again. A further object is to provide improved friction means for equipoised lamps and the like. A still further object is to provide a simplified equipoised lamp construction. A further object is to provide a supporting structure which is counterbalanced throughout a relatively wide range of movement of a supported lamp assembly or the like. A further object is to provide an improved counterbalance mechanism formed by a counterweight and friction means. A further object is to provide for the above with a construction which is versatile, dependable, sturdy, simple, inexpensive to manufacture, and which requires a minimum amount of adjustment and maintenance during normal usage. These and other objects will be in part obvious and in part pointed out below.

In the drawings:

FIGURE 1 is a perspective view of one embodiment of the invention.

FIGURE 2 is a reduced side elevation of the lamp of FIGURE 1 illustrating a range of movement of the lamp assembly.

FIGURES 3 and 5 are sectional views on the lines 3—3 and 5—5, respectively, of FIGURE 1; and

FIGURE 4 is a sectional view on the line 4—4 of FIGURE 3.

Referring to FIGURE 1 of the drawings, an equipoised lamp **2** is mounted upon a fixed vertical pivot, which is not shown, but which projects upwardly into a journal **4** rigidly mounted in the lower end of a square tubular base member **6**. At the upper end of base member **6** there is a friction joint **8** which provides support for the remainder of the lamp structure. The lamp structure includes: a generally vertical arm **10** which is pivoted at its lower end in joint **8**; a counterweight arm **12** which is parallel to arm **10** and is supported parallel to arm **10**; a pair of friction arms **14** which are pivoted in joint **8** and are connected by a pivot bolt **16** to counterweight arm **12**; a generally horizontal arm **18**; a lamp assembly **2** which is mounted upon the free end of arm **18** through a universal pivot assembly **22**; and, a counterweight **24** rigidly mounted upon a lower extension of arm **12**.

The upper ends of arms **10** and **12** are pivoted to arm **18** by pivots **26** and **28**, respectively. Each of pivots **26** and **28** (see FIGURE 5) is formed by a bolt **30**, a pair of ears **32** on the end of the arm **10** or **12**, and a pair of ears **34** on an inverted channel **36** which is held in a rectangular opening **38** in the bottom of arm **18** by a pair of rivets **40**. Positioned upon the central portion of each of the bolts **30** is a sleeve **42** which extends through an enlarged opening surrounded by a flange **44** in each of the ears **34**. The ends of sleeve **42** abut the inner walls of the ears **34**, so that when the nut on bolt **30** is tightened, the ears **32** are clamped against the ends of sleeve **42**. Hence, the sleeve provides a fixed pivot for the ears **34**. The axes of friction joint **8** and pivot **16** are spaced apart the same distance as those of pivots **26** and **28** so as to form a parallelogram link structure, arms **10** and **12** being parallel and arms **14** and **18** being parallel.

As best shown in FIGURE 3, friction joint **8** is formed by: a pair of ears **46** and **48**, which are extensions of opposite side walls of base member **6**; the end of arm **10**; a pair of side plates **50** mounted upon the opposite side walls of the end of arm **10**; pivot portions **51** of the friction arms **14**; and, two pairs of plastic friction washers **53**, each pair being positioned upon the opposite sides of the pivot portion **51** of one of the friction arms **14**. Each of side plates **50** is somewhat channel-shaped so as to snugly receive the side of arm **10**, with a pair of flanges **52** extending around the corner edges of the arm. Each of side plates **50** also has a flange **54** which extends through an opening in the side wall of arm **10**. A bolt **56** forms the pivot, extends through ear **46**, the pivot portions **51** of friction arms **14**, friction washers **53**, side plates **50**, and ear **48**. Bolt **56** has a nut **58**, and is anchored to ear **46** for a lug (not shown).

As indicated above, side plates **50** are fitted onto the opposite sides of the end of arm **10** and the sleeves **54** extend through the respective side walls of the arm. The side plates reinforce the arm and provide a sturdy pivotal mounting for it. Bolt **56** is rigidly mounted in the two ears **46**, and the space between each of the ears and the adjacent side plate **50** is occupied by the pivot portion **51** one of the friction arms **14** and the plastic washers **53** positioned upon the opposite sides of the pivot portion **51**. When nut **58** is tightened sufficiently to produce a clamping action, the plastic washers **53** are compressed and somewhat deformed. The plastic is elastic and flexible and has an "elastic memory" in that it tends to return to its original shape. With this arrangement, the plastic washers insure relatively stable friction conditions between each of the ears **46** and **48** and its friction arm **14**, and there is also relatively stable friction between arm **10** and each of the friction arms **14**. Also, the amount of friction produced is readily changed by turning nut **58**, and the nut is held in adjusted position by a lock-washer. Ears **46** and **48** are sufficiently rigid to prevent the normal tightening of nut **58** from exerting excessive pressures upon arm **10**. Hence, arm **10** will not be damaged even though it is relatively thin walled and of a relatively soft metal such as aluminum.

Referring again to FIGURE 1, the universal pivot assembly permits the lamp assembly **20** to pivot about the longitudinal axis of arm **18** slightly less than 360°, there being a stop structure (not shown) to prevent further turning. The transverse friction joint permits the shade to be swung around the end of arm **18**. The entire assembly may be pivoted about the vertical axis of base member **6** with the arms of the parallelogram structure remaining in their fixed relative positions. During such pivotal movement, the counterweight **24** substantially balances the weight of lamp assembly **20**, both acting through the supporting arms with the center of balance being the axis of friction joint **8**. The counterbalance effect of counterweight **24** may be greater or less than that of lamp assembly **20**, but the difference in the moments, or the amount of unbalance, is never greater than the friction effect of friction joint **8**. Hence, the friction joint **8** supplements the counterbalance system formed by counterweight **24** and the arm assembly so as to produce the very satisfactory system for holding the lamp assembly in any selected position within the range of its possible movement.

In FIGURE 2 there are illustrated typical movements of the lamp assembly, for example, between the full-line position **20** and the broken-line position **20*a*** and **20*b***. During movement of the lamp assembly from position **20** to **20*a***, the angular relationship between arm **10** and friction arm **14** is unchanged so that there is no friction between side plates **50** on arm **10** and friction arms **14**, but the friction arms swing with respect to the ears **46**

and 48 on base member 6 and that produces the desired friction effect. As another example, arm 10 may be swung counterclockwise from position 20 with respect to friction arms 14 to move the lamp head or assembly to position 20*b*. That type of movement produces friction between side plates 50 on arm 10 and the friction arms, and also between ears 46 and 48 on base member 6 and the friction arms. However, with a very similar movement, the friction arms are not pivoted with respect to ears 46 and 48 and there is no friction therebetween. During each of these movements counterweight 24 provides a counterbalancing effect, and when the lamp assembly is stopped in an adjusted position, the friction effect resists movement from the postion.

Lamp assembly 20 comprises a lamp shade and a socket with a manual switch projecting from the shade. There is also a bulb in the socket. The electrical current is supplied through a wire extending from the shade through the tubular arm 18 and thence down arm 10 into base member 6, and it extends from the base member through a grommet and has a plug on its end. The wire is protected, and it is also out of view. The slot in the side of counterweight 24 permits greater freedom of movement during adjustment and also when the lamp is collapsed for movement.

As many possible embodiments may be made of the apparatus of the above invention, all without departing from the scope of the invention, it is to be understood that all matter hereinabove set forth, or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. In an equipoised lamp or the like, the combination of, a base member, an equipoised arm assembly formed by a pair of parallel arms and a lamp-supporting arm connected together by pivot means forming a pair of spaced pivots near one end of the lamp-supporting arm and at the end of each of said pair of arms, a lamp assembly mounted upon said lamp-supporting arm, friction pivot means interconnecting said parallel arms and forming said arms into a parallelogram linkage with one of said parallel arms having one end pivoted directly to said base member, and a counterweight rigidly mounted upon the other of said parallel arms and producing a counterbalancing effect for said lamp assembly about the pivot interconnecting said base member and said one of said parallel arms, said friction pivot means comprising a pair of friction arms having pivot portions positioned upon opposite sides of said one of said parallel arms and positioned between pivot portions on said base member and two pairs of flexible plastic washers positioned respectively upon the opposite sides of said pivot portions of said friction arms.

2. In an equipoised lamp construction as described in claim 1 wherein said base member comprises a vertical post which is mounted at its lower end upon a vertical pivot.

3. In an equipoised lamp construction, the combination of: a counterweight and arm assembly which includes a parallelogram linkage with a lamp-supporting arm and a counterweight arm; a base member; and, a friction pivot assembly which forms a supporting pivot at one corner of said parallelogram linkage, and which comprises, a pair of spaced pivot ears mounted upon said base member, a central member equally spaced therebetween, a pair of flat pivot members positioned respectively upon the opposite sides of said central member and between said pivot ears, and a pair of deformable plastic washers positioned with the washers of one pair upon the opposite sides of one of said pivot members and those of the other pair upon the opposite sides of the other of said pivot members, said parallelogram linkage having the end of one link forming said central member and the end of the next adjacent link formed by said pivot members.

4. In a counterbalance structure for an equipoised lamp or the like, a friction joint comprising, a pair of mounting ears, an arm having one arm end positioned between said ears, a pair of friction plates having pivot portions positioned upon the opposite sides of said arm end and between said ears, means forming friction contact surfaces between each of said friction arms and said arm end and between each of said friction arms and the respective ear, and pivot means extending through said ears and said arms and adapted to provide adjustable pressure between said contact surfaces.

5. A structure as described in claim 4 wherein said arm end is tubular and square in cross-section, and a pair of side plates mounted upon the opposite sides of said arm end, each of said side plates having an integral annular flange extending along said pivot means and a pair of side flanges extending along the adjacent sides of said arm end.

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