May 27, 1930. G. W. HOPKINS 1,760,134

ARC LAMP HANGER

Filed May 16, 1928

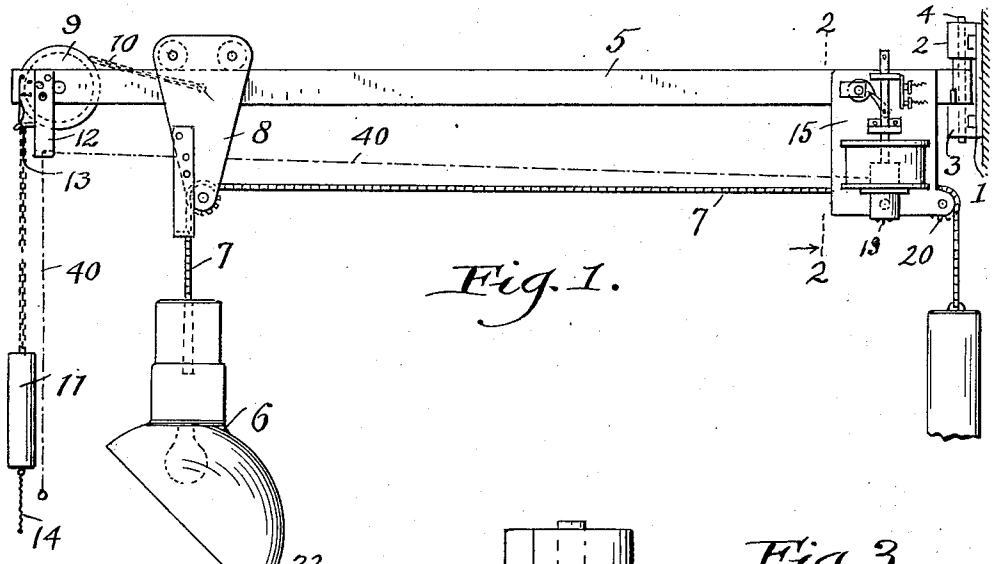


Fig. 1.

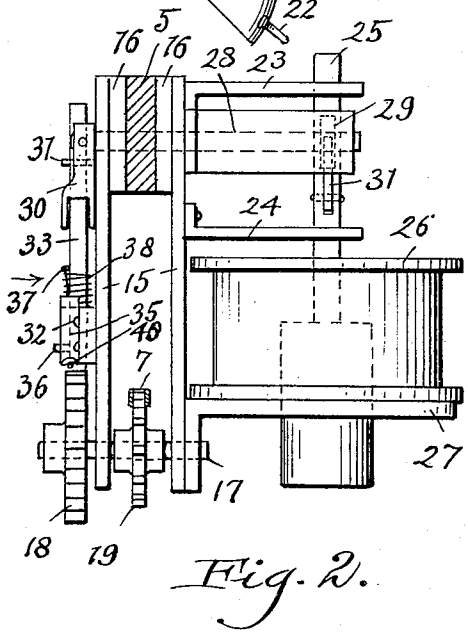


Fig. 2.

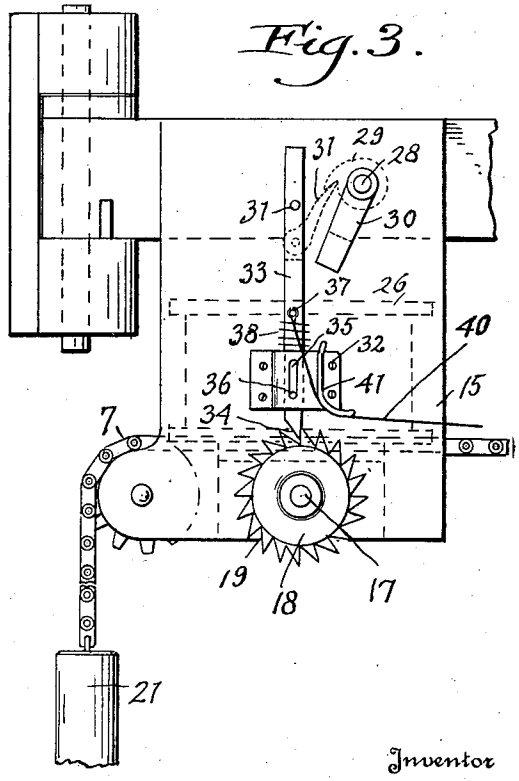


Fig. 3.

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UNITED STATES PATENT OFFICE

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ARC-LAMP HANGER

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This invention relates to a mechanism for holding a suspended device in different positions of vertical adjustment, and for automatically releasing such holding means and returning such device to its uppermost position.

A mechanism of the character included by the invention has particular utility in connection with holding a carbon arc lamp of the type used for therapeutic purposes, and ordinarily suspended from an overhead hanger in vertical positions of adjustment.

It has proven to be a source of annoyance, as well as danger, that frequently the patient receiving a treatment from the ultra violet rays of the lamp has arisen at the conclusion of the treatment and come into contact with the lamp, thus receiving burns and other injuries.

Therefore, the main object of the present invention is to provide a mechanism whereby a suspended device, such as the lamp above mentioned, may be held in different positions of vertical adjustment and automatically released and returned to its uppermost position.

Other objects and advantages will appear hereinafter during the detailed description of a preferred embodiment of the invention.

In the drawings, Figure 1 shows in side elevation a hanger pivoted to the wall, from which is suspended an arc lamp together with a preferred embodiment of the invention for holding the lamp in various positions of vertical adjustment.

Figure 2 is a sectional view through the hanger, taken on line 2—2 of Figure 1, the holding device being shown in end elevation.

Figure 3 is a side elevation of the holding device taken from the side opposite that shown in Figure 1.

A bracket 1 is secured to the wall in the desired position, such bracket having spaced bearing portions 2 and 3 within which is arranged a pintle pin 4 which passes through an eye formed in one end of a hanger bar 5. The hanger bar 5 is thus pivotally attached to the wall and may be swung through substantially a semi-circle so as to increase the range of utility of the lamp carried thereby.

This lamp, indicated in the drawing by the numeral 6, is carried by means of a flexible chain 7, guidably supported at the lower end of a traveling hanger bracket 8 of any preferred construction, which is adapted to ride on the upper edge of the hanger bar 5. At the outer end of the hanger bar 5 a sheave 9 is rotatably journaled for the purpose of guiding a chain 10, having one end attached to the hanger bracket 8 and its other end provided with a counter-weight 11. An angle bracket 12 is also attached to the hanger bar 5 adjacent the sheave 9, such bracket being provided with an outwardly projecting forked portion 13 within which the chain may be secured, so that the hanger bracket 8 will be held in any position along the hanger bar 5 against the normal tendency of the counter-weight 11 to pull the same toward the outer end of the bar. A flexible cord or chain 14 is attached to the lower end of the counter-weight for the purpose of enabling an operator to disengage the chain from the fork 13, so that the counter-weight can move the bracket outwardly of the bar toward the sheave 9. The construction so far described is more or less conventional, and is for the purpose of allowing the radius of the lamp to be adjusted to suit different conditions. It is also necessary to provide a vertical adjustment of the lamp, which vertical adjustment has been done in a variety of ways heretofore, all of which, however, have been of such form that the lamp must be manually raised to its uppermost position at the expiration or conclusion of the treatment. This has proven disadvantageous, because patients frequently arise from the treatment table before the lamp has been moved upwardly out of their reach and have contacted with the same, thereby receiving burns and other injuries.

In order to obviate this difficulty, the present invention contemplates not only means for vertically adjusting the lamp and holding the same in such positions of adjustment, but also means which will automatically release the holding means, whereupon the lamp will quickly and automatically be raised to its uppermost position.

The construction now about to be described accomplishes this purpose and is one of the

preferred forms which the invention may take. A downwardly extending plate 15 is secured to each side of the hanger bar 5 adjacent to its pivoted end, suitable spacer members 16 being interposed between the plates and the bar for the purpose of maintaining the same in suitably spaced relationship.

Adjacent the lower ends of the plates 15 a transversely extending bearing pin 17 is journaled, upon which is rotatably mounted exteriorly of the plates at one side thereof a gear 18, while also rotatably mounted thereon intermediate the plates is a sprocket wheel 19. The flexible chain 7 by which the lamp is suspended from the hanger bracket 8 passes around a sheave rotatably journaled in the lower end of the bracket and extends rearwardly toward the wall, so as to pass between the plates 15 and engage with the the sprocket 19, after which it passes around a sprocket 20 journaled between the plates at their lower rear end, and has a counterweight 21 connected to its vertically suspended free end. It is thus clear that the lamp 6 may be manually moved by means of the handle 22 to various positions of vertical adjustment, such movement causing rotation of the sprocket 19 and of the gear 18.

It is similarly clear that as soon as the grip upon the handle 22 is released that the counter-weight 21 will return the lamp to its uppermost position, and it is for the purpose of preventing this movement of the lamp that the following arrangement is provided. Similar angle brackets 23 and 24 are secured to the plate 15 on the side farthest removed from the gear 18, such brackets supporting and guiding a solenoid plunger 25 adapted to be vertically reciprocated by means of a solenoid 26 carried upon another angle bracket 27 secured to the plate 15 at the opposite end from that at which the brackets 23 and 24 are secured. A shaft 28 passes through the plates 15 and the bar 5 intermediate the angle brackets 23 and 24, such shaft having a ratchet sleeve 29 keyed thereto intermediate the brackets, and a forked arm 30 also keyed thereto upon its other end which projects outwardly of the plate 15 upon the same side as the gear 18.

The solenoid post 25 is provided with a longitudinal slot adapted to be located between the brackets 23 and 24, within which slot is pivotally supported a pawl 31 adapted to engage the ratchet 29, so that when it is moved in one direction it will rotate the ratchet, the shaft 28 and the forked arm 30.

Upon the opposite plate 15 a guide member 32 is secured in a position slightly above the uppermost circumference of the gear 18, this guide member slidably supporting a rod 33 having a beveled lower end 34 adapted to engage the teeth of the gear 18. In order to limit the sliding movement of the rod 33 the support 32 is provided with a vertically disposed slot 35 within which engages a pin 36 carried by the rod. An eye or pin member 37 extends transversely through the rod above the guiding member 32, while a coil spring 38 is arranged between this pin and the member 32. The rod is also provided adjacent to its upper end with a transversely extending pin 39, for the purpose of forming an abutment member adapted to be engaged by the forked arm 30 when the shaft 28 is rotating in a certain direction, and to thereby raise the rod 33 so that the beveled end 34 thereof will be disengaged from the gear 18.

In order that the rod 33 may be moved downwardly until the beveled end 34 engages the teeth of the gear 18, a flexible cord or other member 40 is connected to the pin 37 thereon, and passes beneath a guiding flange 31 carried by the supporting member, from whence it extends forwardly to the angle bracket 12 carried by the forward end of the hanger bar 5, being guided through this angle bracket to a convenient position for the operator. When this cord is pulled by the operator the pin 33 is moved downwardly against the tension of the spring 38, so that its end engages in the gear 18, after which the force exerted by the tendency of the counterweight 21 to descend, maintains the flat face of the teeth of the gear 18 in frictional contact with the flat face of the end of the rod with a sufficient force to overcome the tendency of the spring 38 to move the rod upwardly. In this manner the lamp 6 may be moved to its desired position of vertical adjustment and the cord 40 pulled by the operator to lock the lamp in such position.

In order to automatically move the rod 33 upwardly so that the lamp will be pulled to its uppermost position by the counterweight 21, the solenoid 26 may be connected by suitable connections to a timing switch designed to automatically govern the period of operation of the lamp. The electrical connections of the timing switch have not been shown, since they do not form a part of the present invention and since any suitable well known type of timing switch might be employed for the purpose specified. Therefore, when the period of the treatment is concluded the solenoid is automatically energized and the solenoid post moved so that the pawl 31 carried thereby will engage the ratchet 29 and rotate the shaft 28 in the desired direction, whereupon the forked arm 30 will swing into engagement with the pin 39 carried by the rod 33 and exert a sufficient upward pressure thereon to overcome the frictional engagement between the lower end of the rod and the gear, so that the gear and the sprocket 19 will be free to rotate, and the chain 7 moved by its counter-weight in a direction to pull the lamp upwardly.

Although a preferred embodiment of the invention has been described and illustrated, it should be understood that the same is not limited thereto, but may follow such modifications and adaptations as fall within the scope of the appended claims.

Having thus described my invention what I claim is:

1. A mechanism for holding a suspended device in various positions of vertical adjustment and for returning the same to its uppermost position comprising a flexible suspension element upon one end of which the device to be suspended thereby is secured, means for guiding said element, means associated with said element for normally maintaining said device in its uppermost position, and means for holding said element with its suspended device in any position of adjustment.

2. A mechanism for holding a suspended device in various positions of vertical adjustment and for returning the same to its uppermost position, comprising a flexible suspension element upon one end of which the device is secured and with the other end of which is associated means for normally retaining the device in its uppermost position, means arranged intermediate said device and said first named means for guiding and supporting said flexible element, and means associated with said guiding means to prevent movement of said flexible element, said last named means being adapted to be automatically releasably operated.

3. A mechanism for holding a suspended device in various positions of vertical adjustment and for returning the same to its uppermost position comprising a flexible element upon one end of which the device to be suspended is secured and with the other end of which is associated a means to normally maintain the device in its uppermost position, spaced guiding means for said flexible element intermediate said device and said first named means, and a releasable locking means, said last named means comprising a rotatable member with which said flexible element is operatively associated, a second rotatable member operatively connected with the first member, and means adapted to engage with said second named member to prevent rotation thereof, such means being adapted to be automatically moved to releasing position.

4. A mechanism for holding a suspended device in various positions of vertical adjustment and for returning the same to its uppermost position comprising a flexible element upon one end of which the device to be suspended is secured, and with the other end of which is associated a means to normally maintain the device in its uppermost position, spaced guiding means for said flexible element intermediate said device and said first-named means, and a releasable locking means, said last named means comprising a rotatable member with which said flexible element is operatively associated, a second rotatable member operatively connected with the first member, a plunger adapted to engage said second named rotatable member and to hold the same against rotation, and a solenoid for moving the plunger out of member engaging position.

In testimony whereof, I hereunto affix my signature.

GEORGE W. HOPKINS.