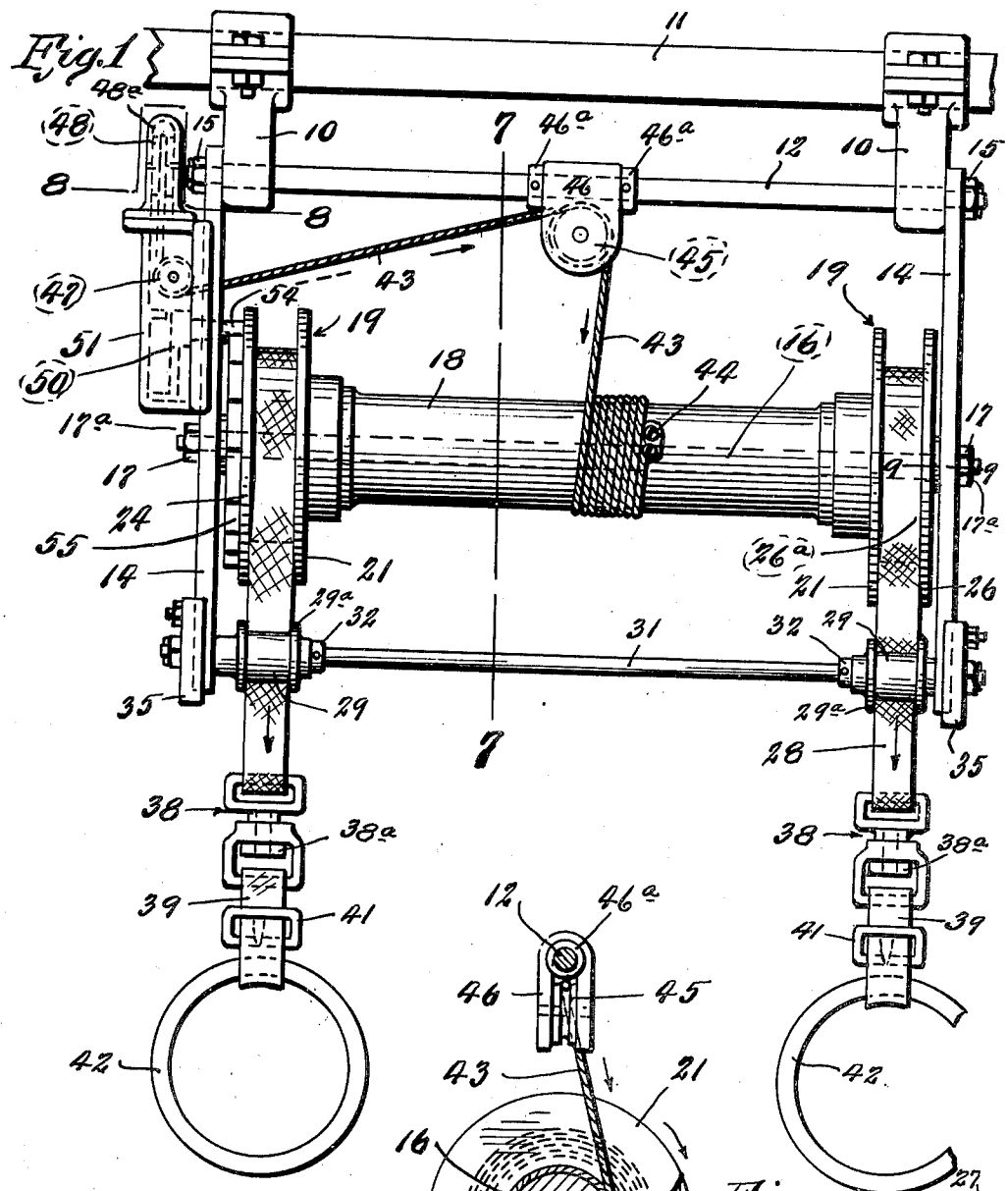
April 16, 1940. M. WIMER 2,197,600

SUPPORTING AND ADJUSTING MECHANISM FOR SUSPENDED GYMNASTIC APPARATUS

Filed June 26, 1937 2 Sheets-Sheet 1

Fig. 1



Inventor
Michael Wimer
By William James,
Atty.

April 16, 1940. M. WIMER 2,197,600

SUPPORTING AND ADJUSTING MECHANISM FOR SUSPENDED GYMNASTIC APPARATUS

Filed June 26, 1937 2 Sheets-Sheet 2

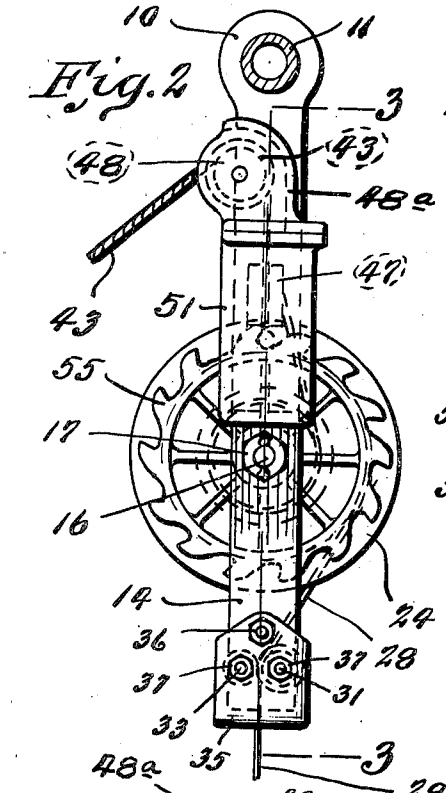


Fig. 2

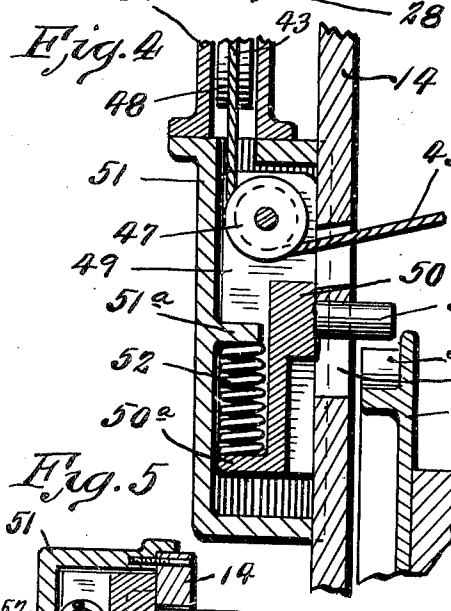


Fig. 4

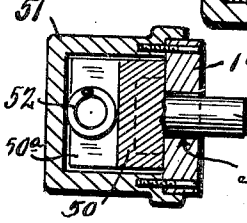


Fig. 5

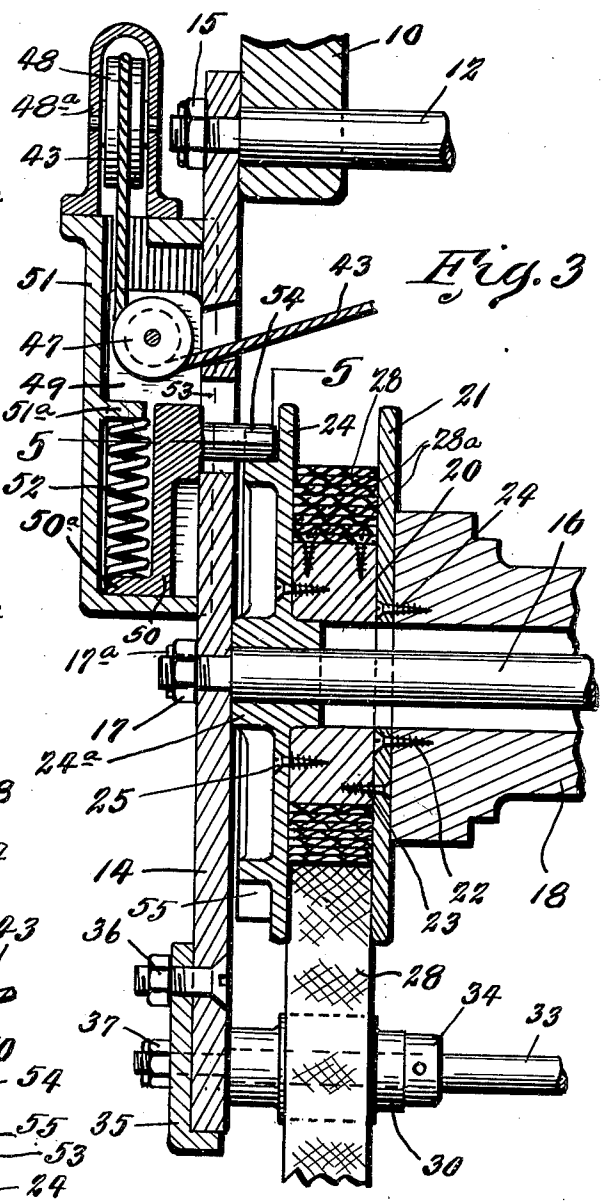


Fig. 3

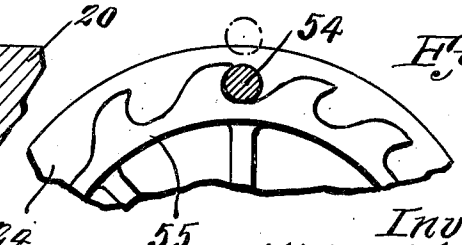


Fig. 6

Inventor
Michael Wimer
By William James Atty.

Patented Apr. 16, 1940 2,197,600

UNITED STATES PATENT OFFICE

2,197,600

SUPPORTING AND ADJUSTING MECHANISM FOR SUSPENDED GYMNASTIC APPARATUS

Michael Wimer, St. Louis, Mo.

Application June 26, 1937, Serial No. 150,448

4 Claims. (Cl. 254—169)

This invention relates to supporting and adjusting mechanism for suspended gymnastic apparatus and the like.

Suspended gymnastic apparatus, such as swinging rings or trapeze, are supported by flexible connections. It is desirable and necessary to raise or lower the apparatus to suit the conditions of the case or to raise the apparatus out of the way when not in use.

Among the main objects of the invention is the provision of mechanism which can be quickly and easily operated to raise or lower the suspended apparatus and which is automatically locked in adjusted position.

Other objects of the invention are to provide mechanism for supporting suitable suspended apparatus, said mechanism being adjustable by a manually operable cord to raise or lower said apparatus and to lock said mechanism in adjusted position.

Another object of the invention is to provide means adapted to be fixed to an overhead support and including a revoluble member over which operates one or more cables or straps which support the suspended apparatus, said revoluble member being operable in either direction to wind and unwind said flexible connections and accordingly to raise or lower said apparatus and to provide means for automatically locking said revoluble member in adjusted position.

Another object of the invention is to provide a mechanism of the class described which is operable by a single cord either to release said mechanism and permit the rotation of the revoluble member in a direction to lower the apparatus or to actuate said revoluble member in an opposite direction to raise said apparatus and to provide locking means for said mechanism operable by said cord in conjunction with the operation of said mechanism.

Another object of the invention is to provide means engaging each suspension strap or cable below the revoluble member and guiding said strap or cable and limiting the upward movement thereof.

With these and other objects in view, my invention consists in certain novel features of construction and arrangement of parts, hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my mechanism.

Figure 2 is an end elevation of same.

Figure 3 is an enlarged vertical cross section taken on line 3—3 of Figure 2.

Figure 4 is a fragmental view of Figure 3 and showing parts of the mechanism in actuated position.

Figure 5 is a horizontal cross section taken on line 5—5 of Figure 3.

Figure 6 is a fragmental detail view of one of the disks of the revoluble member showing the ratchet teeth combined therewith.

Figure 7 is a vertical cross section taken on line 7—7 of Figure 1.

Figure 8 is a horizontal cross section taken on line 8—8 of Figure 1.

Figure 9 is a horizontal cross section taken on line 9—9 of Figure 1.

Referring by numerals to the accompanying drawings, 10 indicates a pair of supports or brackets which are held in position in any suitable manner, in the present instance being secured to a section of construction pipe 11. These brackets are arranged in spaced-apart relation and each is provided with a horizontally disposed aperture for receiving a horizontally disposed rod or shaft 12 which extends between said bracket below said pipe 11.

Each end of said rod extends from said bracket and receives the upper end of a vertically disposed bar or plate 14. Each of these plates is preferably rectangular in cross section, as shown, and extends a suitable distance below shaft 10. A nut 15 or other suitable device is arranged on each end of shaft 10 to prevent displacement of plates 14.

Intermediate the ends of each plate or bar 14 is a horizontal aperture for receiving one end of a horizontally disposed shaft 16. A nut 17 engages each screw-threaded projecting end of said shaft and holds the latter in place between said plates. A cotter pin 17a or other suitable means can be used to lock each nut in place. The shaft 16 is held stationary and revolubly arranged on said shaft is a drum or roller 18. The ends of this drum terminate short of the bars 14 to accommodate spools 19 which are fixed to said drum.

As shown, each spool consists of a cylinder or core 20 and a pair of end disks. The inner disks 21 are fastened to the respective ends of drum 18 by screws or pins 22 and to the core 20 by screws or pins 23.

One of the outer disks 24 (lefthand side) is secured to the core 20 by screws or pins 25. The other (or righthand side) disk 26 is secured to the core 20 by screws or pins 27. Disk 24 is formed of metal and has formed integral therewith a hub 24a which is revolubly mounted on

shaft 16 and forms a bearing for this end of the revoluble member or drum. Disk 26 is formed in the present case of press wood and therefore has fixed thereto a metal plate 26a with which is formed integral a hub 26b which operates on shaft 16 and forms a bearing for this end of the drum. The inner disks 21 are also formed of press wood and drum 18 is formed of wood. Drum 18 and cores 20 are each formed with a comparatively large axial bore or opening so as to clear said shaft 16, thereby reducing the weight of the revoluble member and reducing friction between the latter and the stationary shaft. However, if desired, the entire revoluble member could be cast in one piece.

Wound on each spool 19 is a strap or cable 28 the inner end of each strap being fixed to the corresponding core 20, as indicated at 28a. These straps extend downwardly and each passes over a roller 29 and is held in engagement therewith by a roller 30. These rollers are disposed a suitable distance below the drum 18 and in proper alignment therewith. Each roller 29 is formed with radial flanges 29a which serve to guide each strap and maintain it in proper alignment with the corresponding spool 19. Each roller 30 fits between the flanges 29a of the corresponding roller 29 and engages the opposite side of the strap. Rollers 29 are loosely arranged on a stationary shaft 31, being held in place therein by having one end bearing against the lower end of the respective plate 14 and having the other end bearing against a collar 32 fixed on said shaft 21. Rollers 30 are similarly mounted on a shaft 33 being held against outward movement by the respective bar 14 and against inward movement on said shaft by fixed collars 34. As each pair of rollers 29 and 30 are arranged close together they not only serve to guide the strap during its movement but also limit the upward movement thereof.

The ends of shafts 31 and 33 are preferably reduced in diameter and pass through apertures formed in the lower ends of plates 14 and through apertures formed in plates 35. Each of these plates 35 fits against the lower end of plates 14 and is held in position thereon by a nut and bolt device 36. The purpose of these plates 35 is to reinforce the ends of bars 14 and provide additional support for said shafts 31 and 33. The ends of these shafts receive nuts 37 which hold said shaft in place.

Each strap 28 has its lower end looped to receive the upper end of a swivel connection 38, the lower end of which is engaged by a strap 39. The ends of each strap 39 are secured together by a buckle 41 or in any other suitable manner so as to support a swinging ring 42. When the straps are to be used to support a trapeze the bar is secured directly to the looped ends of said straps 28. The lower member of each swivel connection 38 is supported on the upper member by means of a ball bearing 38a so that said lower member is free to swing about a vertical axis.

The roller or drum 18 is adapted to be actuated to wind or unwind straps 28 on the respective spools 19, thereby raising or lowering the rings as required. The drum 18 is operated in one direction to wind up the straps by means of a cord or cable 43. One end of this cord is secured to the drum, as indicated at 44. The cable then passes over the lower half of the drum, as shown in Figure 1, and winds on said drum in a clockwise direction, and then passes upwardly and over a pulley 45 arranged above said drum. This pulley is journaled in a bracket 46 which is loosely supported on rod 12 and is disposed at a right angle to the axis of drum 18. From this pulley 45 the cable 43 extends to one side (lefthand side in Figure 1) and passes under a pulley 47 and then upwardly and over a pulley 48. After passing over the last-mentioned pulley the cable extends downwardly to a suitable point where it can be conveniently secured and manually operated.

Pulley 47 is disposed parallel with pulley 45 and has its trunnions mounted in the upper ends of side walls 49 of a member 50. A housing 51 is fixed to one side of one of the plates 14 and member 50 is mounted in said housing for movement in a vertical plane. The lower end of member 50 is formed with a horizontal extension or shelf 50a bearing on which is the lower end of a coiled spring 52, the upper end of which bears against a horizontal fixed extension 51a formed in said housing. Thus member 50 is urged downwardly to its home or depressed position by the force of said spring as well as by gravity.

Fixed to member 50 and projecting horizontally therefrom through a slot 53 vertically disposed in the corresponding plate 14 is a pin 54.

Disk 24 has formed on its outer face a ratchet wheel 55, the teeth of which are presented clockwise or in the same direction in which the drum 18 operates to unwind or lower the straps. The pin 54, when member 50 occupies normal or depressed position, engages one of said ratchet teeth and holds the spools and the drum stationary and locked against unwinding movement as shown in Figure 6.

When the cable 43 is pulled just enough to move the member 50 upwardly in housing 51, pin 54 is unseated or raised out of engagement with the ratchet teeth, as indicated in dot-and-dash lines in Figure 6.

If the cable or line 43 is now slowly paid out without permitting slack in said line, the spools 19 and drum 18 will rotate in a direction to unwind and lower said straps while the line 43 will be wound on said drum. The combined weight of the rings and their connections and the straps is sufficient to overcome the tension of the coil spring and operate the drum in the strap unwinding direction, as indicated by solid arrow in Figure 7, and at the same time maintain the line 43 taut so as to hold member 50 in raised position.

If, however, line 43 is quickly paid out or released so as to produce a slack in said line between the drum and pulley 48 the spring will reassert itself and force the member 50 downwardly, thereby setting pin 54 in engagement with one of the ratchet teeth and thus locking said drum against further unwinding movement.

To raise the rings and wind the straps on the spools 19 the line 43 is pulled downwardly first to unseat the pin 54 and then to unwind the line from drum 18. This causes said drum and spools to rotate anti-clockwise, thereby winding the straps on said spools and raising said rings. When the rings have been raised to the desired height the line 43 is suddenly released so as to allow the coiled spring to move member 50 downwardly and seat the pin 54 in locking position. Thus line or cable 43 is operated both to release the spools and drum so that the straps and rings can be lowered and to raise said rings and also to operate the locking means.

Pulley 48 is mounted in a housing 48a which is

fixed to the top of casing 51. As shown in Figure 8, this housing can be adjusted to either one of two positions so that the cord 43 can extend either at right angle to the device, as shown in full lines in Figures 1 and 8, or longitudinally thereof, as shown in dot-and-dash lines in Figure 8.

Only one line or cord 43 is needed to operate both the drum 18 and the locking means therefor, thereby eliminating confusion and simplifying the operation. The brackets or hangers 10 can be fixed to any suitable overhead construction. Revoluble drum 18 is mounted for rotation on shaft 16 which is stationarily fixed in a support pivotally mounted from hangers 10. This support or bar consists of the horizontal shaft 12 which forms the top of the frame, stationary shafts 31 and 33 which form the lower horizontal member of the frame, and plates or bars 14 which form the vertical side members of said frame. These parts are firmly secured together and the whole frame or support is suspended from brackets or hangers 10 by means of shaft 12. The cord 43 is wound on revoluble member 18 in a direction opposite to that of straps 28 so that said cord is wound when the straps are unwound and vice versa. The pin 54 and ratchet wheel 55 provide safe and reliable locking means for holding the drum, and the swinging apparatus supported by the straps, in any adjusted position. The coiled spring 52 provides positive means for bringing the pin 54 into locking position as soon as the cord 43 is released.

While the device as shown and described herein is applied to a swinging gymnastic apparatus, it is obvious that my invention can be applied to other uses without departing from the spirit of my invention.

I claim:

1. In a device of the class described, the combination of a pair of spaced-apart side members adapted to be suspended, a horizontally disposed drum revolubly mounted in said side members, a flexible connection fixed at one end on said drum and wound thereon, the free end of said connection being weighted so as to operate by gravity said drum in one direction to unwind said connection, a cord wound on said revoluble drum in a direction opposite to said flexible connection, and manually operable in one direction to wind said flexible connection on said drum and being free to operate in the opposite direction and to be wound on said drum when said flexible connection is unwound, means for locking said drum against rotation, said means including a ratchet wheel fixed on one end of said drum, a vertically movable member mounted on one of said side members, and spring-pressed into engagement with said wheel, and a pulley mounted on the upper end of said vertically movable member and engaged by said cord, said vertically movable member being movable out of its locking engagement with said ratchet wheel, when said cord is manually operated, and a pair of rollers mounted in said side members below said drum for receiving therebetween the weighted free end of said flexible connection and limiting the upward movement thereof.

2. In an apparatus of the class described, the combination of a pair of vertically disposed spaced-apart plates pivotally mounted at their upper ends, a horizontal member revolubly supported by said plates, a flexible connection wound on said revoluble member and extending downwardly, a ratchet wheel fixed to one end of said revoluble member, a member slidably mounted on one of said plates for movement in a vertical plane, a horizontally disposed pin fixed to said slidable member and extending laterally for engagement with said ratchet wheel to lock said revoluble member against unwinding rotation, a cord wound on said revoluble member, a pair of fixed pulleys disposed in spaced-apart relation above said revoluble member for receiving said cord, and a pulley disposed between and below said pair of pulleys and mounted in said slidable member whereby when said cord is manually operated said slidable member is raised, thereby disengaging said locking pin from the ratchet wheel and releasing said revoluble member.

3. In an apparatus of the class described, the combination of a pair of vertically disposed spaced-apart plates pivotally mounted at their upper ends, a drum extending between and revolubly supported by said plates, a flexible connection wound on said drum and extending downwardly, a ratchet wheel fixed to one end of said revoluble drum, a casing fixed to one of said plates adjacent to said ratchet wheel, a vertically slidable member mounted in said casing, a horizontally disposed pin fixed to said slidable member and engageable with said ratchet wheel to lock said drum against rotation to unwind said connection, a cord wound on said revoluble drum in a direction opposite to said flexible connection, a pair of pulleys fixed above said revoluble drum in spaced-apart relation with each other, and a pulley fixed to said slidable member intermediate the first-mentioned pulleys, said cord passing over said pulleys whereby said slidable member is moved upwardly to disengage said pin from said ratchet wheel when said cord is manually operated.

4. In an apparatus of the class described, the combination of a pair of fixed hangers, a horizontally disposed bar mounted in said hangers, a pair of side members having their upper ends mounted on said bar, a horizontally disposed drum revolubly mounted in said side members, a flexible connection wound on each end of said drum and having its free end extending below said drum and carrying a suitable gymnastic appliance, whereby said drum is operated by gravity in a direction to unwind said flexible connection, a cord wound on said revoluble drum in opposite direction to said flexible connections for operating said drum to wind said connection, locking means fixed to one of said side members and including a vertically movable member, and a horizontally disposed pin extending from said vertically movable member into engagement with said revoluble drum for locking it against unwinding movement, said locking means being operable by said cord to release said drum, and a pair of rollers stationarily mounted below each end of said drum and engaging the loose end of each flexible connection for guiding the latter and limiting the upward movement thereof.

MICHAEL WIMER.